Routledge
Taylor & Francis Group

Local financial development and the growth of small firms in Vietnam

Viet T. Tran[a,b], Yabibal M. Walle[a,c], Helmut Herwartz[a] and Trung Thanh Nguyen[d]

[a]Chair of Econometrics, Georg-August-University of Göttingen, Göttingen, Germany; [b]Department of Postgraduate Management, Vietnam National University of Forestry, Hà Nội, Vietnam; [c]German Institute of Development and Sustainability, Bonn, Germany; [d]School of Economics and Management, Leibniz University Hannover, Hannover, Germany

ABSTRACT

This paper examines whether heterogeneities in financial development among Vietnamese provinces matter for firm growth in Vietnam. Using a nationally representative firm survey that covers more than 41,000 firms for the period 2009 − 2013, we estimate the impact of provincial financial development on the growth rates of firms by accounting for sectoral differences in growth opportunities. We find that province-level financial development promotes the growth rates of sales, investment and sales per worker of small firms, and reduces the growth rate of the wage-to-sales ratio. Our results imply that firms grow faster in provinces with a higher level of financial development. Moreover, the effect of financial development on growth rates is larger when firms operate in sectors with better growth opportunities.

1. Introduction

Over the past four decades, a large theoretical and empirical literature has discussed whether or not financial development promotes economic growth. Much of the literature emphasizes that financial development enables economic growth through its various functions, which help not only in the mobilization of capital but also in its best allocation (Schumpeter 1911; Goldsmith 1969; World Bank 1989; Levine 2005). This view is supported by a number of empirical studies that document a positive effect of financial development on economic growth (e.g. King and Levine 1993; Levine, Loayza, and Beck 2000; Jalil and Feridun 2011; Jung and Kendal; Herwartz and Walle 2014; Alhassan, Adamu, and Safiyanu 2021). However, there are still a considerable number of studies suggesting either that financial development is caused by economic growth (and not vice versa) or that there is a generally weak or fragile relationship between financial development and economic growth (e.g. Ang and McKibbin 2007; Andersen and Tarp 2003). Proponents of the latter view include Robinson (1952), who famously stated, 'where business leads, finance follows'. Lucas

---

(1988), a Nobel laureate in economics, also dismisses finance as an 'overemphasized' determinant of economic growth.

While the finance-growth nexus has typically been studied at the cross-country level, a few recent contributions have examined whether heterogeneities in financial development within a country might affect local economic development at the regional, firm, or household level. Namely, they raise the question of whether it is sufficient to have a developed financial system at the country level, or whether spatial differences within a country matter for economic development at the local level. Existing studies have generally confirmed that local financial development matters for local economic growth (Guiso, Sapienza, and Zingales 2004; Fafchamps and Schündeln 2013; O'Toole and Newman 2017; Tran, Walle, and Herwartz 2018; Tran, Walle, and Herwartz 2020). However, due to the peculiarities of financial and economic systems in each country, many more country-specific studies covering different institutional and macroeconomic environments are needed to generalize that sub-national heterogeneities in financial development matter for local economic development in most, if not all, countries. Moreover, little is known on how sub-national heterogeneities in financial development affect the growth of small firms in a developing country context where the financial sector, in spite of having improved over time, is still deficient and far from the level in developed economies. Against this background, the goal of this study is to examine whether local (province-level) financial development affects the growth of small firms in Vietnam as a developing country.

Several factors make Vietnam an interesting country to examine the extent to which local financial development matters for the growth of small firms. First, Vietnam has experienced rapid economic growth during the last several years (Nguyen 2009; Nguyen et al. 2021), and its financial sector has been under gradual reforms (Pham, Nguyen, and Johnston 2022; Ho, Nguyen, and Nguyen 2021; Tran, Nguyen, and Tran 2019). Second, small firms with less than 20 employees account for about 90% of all firms in Vietnam and are very important in generating income and employment (World Bank 2014). Third, Vietnam has a nationally representative annual survey at the enterprise level, the Vietnam Enterprise Survey (VES), which allows for a large-scale investigation of the topic in question.

Although there are a few studies that address the effect of sub-national differences in financial development on firm growth in Vietnam (e.g. O'Toole and Newman 2017; Tran, Walle, and Herwartz 2020; An and Yeh 2021), none of these studies has accounted for differences in sectoral growth opportunities. Fisman and Love (2007) argue that financial institutions lend more to firms in sectors with better growth opportunities in anticipation of growth, and the high correlation between the volume of credit extended to these firms and their growth rates may not reflect the true impact of financial development on firm growth. Instead, it may simply be a proxy for the effect of other confounding factors that have created growth opportunities in these sectors. Thus, as a main estimation strategy, and as an important contribution to the existing literature, our study accounts for these sectoral differences in growth opportunities to examine whether local financial development affects the performance of small firms in Vietnam.

Our dataset covers more than 41,000 firms for the years 2009 and 2013. We measure the level of local financial development by the number of credit suppliers per 1,000 persons in a given province. As a robustness check, we also consider the number of credit suppliers per square kilometre.

The remainder of this paper is structured as follows. In Section 2, we provide a brief theoretical background on the nexus between finance and growth, both at the macro and micro level. Section 3 outlines the estimation methodology and provides the descriptive statistics of the data used in our analysis. Empirical results are discussed in Section 4. Section 5 summarizes the main findings. Appendix A provides a brief overview of the Vietnamese financial system and small businesses, and the corresponding heterogeneities across Vietnam's provinces. Additional information on firms by sector and financial development by province can be found in Appendices B and C, respectively. Robustness check results are presented in Appendices D1, D2, D3 and D4. Moreover, Appendices E1, E2, E3 and E4 report the estimation results that include growth opportunities and financial development separately.

2. Theoretical background: the finance-growth nexus at the macro and micro level

In this section, we first provide a brief review of the literature on the impact of country-level financial development on macroeconomic development. Subsequently, we provide potential ways through which financial development could promote firm performance and review empirical studies that examine the relationship between local financial development and firm growth.

2.1. The finance-growth nexus: theoretical background

The debate about the role of the financial sector in economic development goes back at least to the early 20th century. Schumpeter's (1911) emphatic stance on the role of finance as a crucial driver of economic development is perhaps best summarized in his statement that 'one can only become an entrepreneur by previously becoming a debtor'. Several economists, such as McKinnon (1973), Shaw (1973) and Levine (2005) also share the view that financial development promotes economic growth. Proponents of this view argue that the financial development has at least five functions that can stimulate economic growth (Levine 2005). First, financial institutions and markets pool savings from disparate depositors, increasing the volume of savings in the economy. Second, financial intermediaries reduce the cost of acquiring and processing information on potential investment opportunities, allowing financial resources to be channeled to high-yield projects, which in turn has a positive impact on resource allocation. Third, financial intermediaries also promote economic growth through their function in monitoring firms and exerting corporate governance as providers of capital. Fourth, the financial system also provides economic agents with valuable opportunities to diversify inter-temporal and cross-sectional risks, enabling the financing of long-term projects as well as high-risk but high-return projects. Fifth, financial institutions also reduce transaction costs by facilitating the exchange

of goods and services. In general, it is argued that improvements in the way the financial system delivers these five important functions drive economic growth, first by increasing the volume of savings available for investment and, second, by enhancing the efficiency with which resources are allocated and utilized. However, some economists are skeptical about the positive role of financial development in economic development. According to these economists, financial development is driven by the demand emanating from the real sector and not vice versa (Robinson 1952; Patrick 1966). The main implication of this view is that trying to create financial development ahead of the demand for it will not generate economic growth and, therefore, financial development should not be considered as one of the drivers of economic growth. Consistent with this view, Lucas (1988) famously argues, 'the importance of financial matters is very badly over-stressed'.

The aforementioned divergent theoretical views and the conflicting policy recommendations that arise from them have triggered a large body of empirical literature on the finance-growth nexus, especially over the past four decades. Similar to the theoretical literature, however, empirical evidence on the role of finance in economic development is largely mixed. For example, most empirical studies - using a variety of estimation strategies - confirm that financial development does indeed promote economic growth (e.g. King and Levine 1993; Rajan and Zingales 1998; Levine, Loayza, and Beck 2000; Herwartz and Walle 2014; Alhassan, Adamu, and Safiyanu 2021). However, there are some studies, such as Ang and McKibbin (2007) and Hartmann, Herwartz, and Walle (2012), which find a unidirectional causality from economic growth to financial development. Other studies even report that the link between financial development and economic growth is weak or 'broken' (Andersen and Tarp 2003; Demetriades and James 2011).

2.2. Local financial development and economic growth

Firms could benefit from a developed financial system in several ways (Beck and Cull 2014). First, a developed financial sector facilitates market entry for new firms, enables existing firms to expand, and promotes innovative activities (e.g. Aghion, Fally, and Scarpetta 2007). Second, financial development - through its crucial functions mentioned above - enables firms to exploit growth opportunities and thereby achieve a larger equilibrium size (e.g. Beck, Demirgüç-Kunt, and Maksimovic 2005). Third, the degree of financial sector development is an important determinant of the type of asset portfolios held by firms and of the organizational forms they choose. For example, Demirguc-Kunt, Love, and Maksimovic (2006) provide evidence of a positive relationship between a country's level of financial development and the likelihood that firms will choose to establish a corporation as their organizational form. This positive correlation is attributed to the fact that firms in countries with a developed financial sector face fewer legal and bureaucratic challenges. Fourth, since small firms are more financially constrained than large firms (e.g. Beck and Demirguc-Kunt, 2006; Yu et al. 2022), it is the small and medium-sized firms that benefit most from financial development (e.g. Beck and Demirguc-Kunt, 2006).

While the above discussion generally predicts a potentially positive impact of country-level financial development on firm performance, it does not explicitly state whether this development has to occur at the local level (e.g. province, district, and municipality) for firms to benefit. However, it is plausible to imagine that physical proximity between financial institutions and firms determines how well firms could benefit from financial development. For example, seeking external credit from financial suppliers available in the province where a firm is located is often easier than seeking credit from suppliers in more distant localities (Fafchamps and Schündeln 2013). This is because applying for a loan from financial suppliers in remote areas would not only increase transaction costs but also increase the likelihood that applications would be rejected because financial suppliers have less information about distant firms than about firms in their localities. In one of the first studies in this direction, Petersen and Rajan (2002) show that, even in the United States, firms' chances of obtaining a loan depend negatively on the physical distance between the firm's location and that of the bank. Empirically, Guiso, Sapienza, and Zingales (2004) examine the relationship between regional financial development and firm performance in Italy. They find that local financial development enhances firm growth, promotes competition and favors the entry of new firms. Similarly, Dehejia and Lleras-Muney (2007) examine the effects of the state-level banking regulation and financial development on the state-level economic growth in the US using data from 1900 to 1940. The results show that financial expansion, which is induced by bank branching, fosters mechanization in agriculture and spurs growth in the manufacturing sector. Fafchamps and Schündeln (2013) consider the impact of commune-level financial development on firm performance in Morocco for the period 1998 to 2003. Their findings show that, at the commune level, bank availability robustly enhances growth rates of small and medium-sized firms in sectors with growth opportunities. Moreover, the availability of bank branches at the commune level reduces the likelihood of firm exit, encourages entry of new firms and promotes investments.

The impact of local financial development on firm growth has also been investigated for the case of Vietnam. For instance, O'Toole and Newman (2017) exploit an extensive firm-level dataset in Vietnam to investigate the role of provincial financial development in reducing external financing constraints faced by firms. The results show that provincial financial development mitigates the financing constraints of firms and facilitates investment activity. Employing a large firm-level dataset covering more than 40,000 firms for the period 2009 − 2013, Tran, Walle, and Herwartz (2020) document a positive impact of local financial development on firm growth in Vietnam. None of these studies of Vietnamese firms, however, has accounted for differences in sectoral growth opportunities. As Fisman and Love (2007) argue, financial institutions are more likely to expand their services to sectors where they see better growth opportunities. Consequently, a positive correlation between local financial development and firm growth may not reflect the impact of financial development on firm growth if sectoral differences in growth opportunities are not taken into account. Therefore, the objective of this study is to re-examine whether local financial development affects the growth of small firms in Vietnam by controlling for sectoral differences in growth opportunities.

3. Study design

3.1. Data source and estimation strategy

For our analysis, we combine firm-level data with province-level data. The firm-level data are taken from the two survey waves of the Vietnam Enterprise Survey (VES) managed by the VGSO in 2009 and 2013. The sample of firms is representative for all sectors of the Vietnamese economy. The objective of the survey is to provide reliable information for policy makers at both national and provincial levels. The classification of sectors is based on the VSIC (Vietnam Standard Industrial Classification, 2007), which, in turn, is based on the classification of the United Nation's Statistical Division. The survey questionnaire was designed by the VGSO and mailed to the financial managers of the surveyed firms in accordance with the Law on Statistics. The questionnaire captures information on firms' balance sheets and other firm characteristics.[1] The province-level data are from the official statistics of each province published by the VGSO.

We focus our analysis on small firms. The World Bank (2014) classifies firms in Vietnam into two categories, small and medium firms (up to 100 employees) and large firms (more than 100 employees). It is noteworthy that there is more than one definition for categorizing firms in Vietnam, including the one by the Organization for Economic Co-operation and Development. However, as we would like our study to be comparable with other studies using micro level data, we follow the stratification suggested by the World Bank. Thus, small firms are defined in our study as those having less than 20 employees. We choose the following indicators to represent the performance of small firms: Sales, investment, sales per employee, and the wage-to-sales ratio. We select only firms that have been surveyed in both years 2009 and 2013, as this allows us to calculate the economic growth rates of each firm during this period. Our sample of small firms thus includes 34,537 firms in 18 sectors in 39 provinces of Vietnam (see Table 4 for the list of the sectors and Appendix C for the list of the provinces). Accordingly, the growth rates of the performance indicators of small firm i in sector s and province p from year $t0$ (2009) to year $t1$ (2013) are determined as

$$\Delta y_{isp}^{t0-t1} = y_{isp}^{t1} - y_{isp}^{t0}, \tag{1}$$

where y_i refers to either sales, investment, sales per worker or the wage-to-sales ratio of firm i. Except for the wage-to-sales ratio, these variables are measured in 2009 Vietnamese Dong (VND) and converted into natural logarithms.

Our key interest is the relationship between provincial financial development and the growth rates of small firms over the period 2009–2013. As the emergence of financial suppliers might also depend on the performance of firms in the region, endogeneity is a serious concern in estimating the impact of local financial development on firm growth (Halkos and Tzeremes 2012). To address this problem, we follow the strategy first suggested by Fisman and Love (2007) and later adopted by Fafchamps and Schündeln (2013) to account for the fact that, within a sector, large firms should react to growth opportunities better than small firms, as they are less likely to be constrained by access to credit (Beck, Demirgüç-Kunt, and Maksimovic

2005). There are several reasons why, in a given sector, a large firm could better benefit from easier access to finance in comparison with a small firm. First, large firms are more likely to operate in a broader area which could cover several provinces. This would bring them more opportunities to access finance because they likely have more and better relationships with financial suppliers operating not only in their own locality but also in other localities (Fafchamps and Schündeln 2013). Second, from the side of financial suppliers, it is often easier to obtain information about large firms than about small firms. Thus, financial suppliers can better evaluate, for instance, the loan applications of large firms than those of small firms (Petersen and Rajan 2002). Third, in comparison with small firms, large firms have more assets and hence could provide more collateral, which is often very crucial in obtaining loans from financial suppliers (Yu et al. 2022). Moreover, regarding production, large firms could be more efficient as they might better coordinate their resources and use more specialized inputs than small firms (Halkos and Tzeremes 2007).

We calculate the growth opportunities (GO) for each of the 18 sectors based on the data from financially less constrained firms (i.e. large firms). As our small firms have less than 20 employees, we consider firms having more than 50 employees as 'large firms'. In addition, following the classification of the World Bank (2014), we use the group of firms with more than 100 employees as an alternative definition of 'large firms'. The GO for sector s over the period 2009–2013 is calculated based on the sales growth of large firms in this sector as

$$GO_s^{t0-t1} = \ln\left(\sum_{f=1}^{N,t1} Sales_f^{t1}\right) - \ln\left(\sum_{f=1}^{N,t0} Sales_f^{t0}\right), \qquad (2)$$

where GO_s^{t0-t1} is the GO of sector s from $t0$ (2009) to $t1$ (2013), f is a large firm in sector s, N is the number of large firms in sector s, $Sales_f^{t1}$ and $Sales_f^{t0}$ are the sales of large firm f in years $t1$ and $t0$, respectively. Sales are measured in 2009 VND. In order to avoid spurious results driven by firms moving across size and sectors between 2009 and 2013, we focus on those firms that were classified as 'large firms' (more than 50 or 100 employees) in 2009 and still existed in the same sector in 2013. In other words, we do not consider firms that have changed sectors during this period or that are new in 2013. Thus, our samples of large firms for identifying the GO includes 37,068 firms with more than 50 employees and 21,336 firms with more than 100 employees.

We examine the effect of local financial development on growth rates of small firms calculated as defined in (1). Our hypothesis is that the growth rate of economic indicators of small firm i in sector s in province p over the period from year $t0$ to year $t1$ (Δy_{isp}^{t0-t1}) is determined by (i) the financial development indicator in this province in year $t0$ (FD_p^{t0}), (ii) the growth opportunities of sector s over the period from year $t0$ to year $t1$ (GO_s^{t0-t1}), (iii) the level of the economic indicator under scrutiny in year $t0$ (y_{isp}^{t0}), (iv) a vector of other explanatory variables for small firm i, for sector s and for province p in year $t0$ (X_{isp}^{t0}), and (v) vectors of provincial dummies (D_p) and sector dummies (D_s). Accordingly, our estimation model is of the following form:

$$\Delta y_{isp}^{t0-t1} = \beta_1 FD_p^{t0} GO_s^{t0-t1} + \beta_2 y_{isp}^{t0} + \beta_3 FD_p^{t0} y_{isp}^{t0} + X_{isp}^{t0}\gamma + D_p\mu + D_s\theta + e_{isp}, \qquad (3)$$

where e_{isp} is the error term.

Owing to the calculation of GO, which is usually based on a period of time such as five years, our empirical study relies on cross-sectional data. Following the recommendation of Fisman and Love (2007) that studies aiming to examine the impact of financial development on firm growth should control for the sectoral differences in growth opportunities, and similar to the estimation strategy implemented by Fafchamps and Schündeln (2013), we use sectoral GO as a way to address endogeneity concerns and apply the ordinary least squares method (OLS) to estimate the model in (3).

Our variable of interest is the interaction between local financial development and growth opportunities (the first component on the right hand side of equation (3)). Accordingly, the coefficient of interest is β_1. Following Fisman and Love (2007), we hypothesize that small firms will grow faster in locations with better financial development when they operate in a sector with high growth opportunities. Similarly, as the demand for external credit is low in a sector with low growth opportunities, local financial development may not affect firm performance in such a sector. Thus, when firm performance is measured by means of the growth rates of sales, investment and sales per worker, we expect a positive estimate of β_1 which implies that local financial development promotes firm performance in the presence of strong growth opportunities. It also implies that the impact of financial development is stronger in provinces with large growth opportunities. In a location with better financial development, the difference in growth rates between firms in a sector with better growth opportunities and firms in a sector with less favorable growth opportunities is larger than in a location featuring less financial development. With regard to the growth rate of the wage-to-sales ratio, the coefficient β_1 is expected to be negative, as we expect local financial development to increase the efficiency of labour use.

We follow Fafchamps and Schündeln (2013) to measure local financial development by means of the availability of financial suppliers at the province level. Seeking external credit from financial suppliers available in the province where the firms are located is often easier than seeking credit from suppliers in more distant localities. This is because applying for credit from financial suppliers in remote areas would not only increase transaction costs but also increase the likelihood of their applications getting rejected because financial suppliers have less information about these firms than about firms in their localities. Thus, our financial development indicator for each province is the number of credit suppliers per 1,000 persons in that province (FD1). As a robustness check, we also employ the number of financial suppliers per square kilometre in each province as an alternative measure of local financial development (FD2)[2]. Appendix B provides the number of firms by different sizes (less than 20 employees, more than 50 employees and more than 100 employees) and 18 sectors used in our study, while Appendix C provides the list of the provinces, the number of financial suppliers in each province, and the values of FD1 and FD2 by province in 2009 and 2013.

Regarding other control variables, we include the value of the economic indicators under scrutiny in year t_0 (y_{isp}^{t0}) to account for effects of initial conditions (see, e.g. Evans 1987; Fisman and Svensson 2007) and the interaction between FD_p^{t0} and y_{isp}^{t0} to avoid spurious results (Fafchamps and Schündeln 2013). To account for firm-level effects, we include a variable to indicate whether the firm is private, and the number of employees of the firm. In order to control for the influence of sector and provincial conditions, we add the share of sector value added in the province in the value added of the province, and the share of sector employees in the province in the population of the province (Fafchamps and Schündeln 2013). Moreover, all specifications include province and sector fixed effects to account for other unobserved characteristics of provinces and sectors.

3.2. Data description

Table 1 documents summary statistics for the sample of small firms (<20 employees) that are used for estimation. Panel 1 A of this table provides information about firm-level characteristics. On average, each firm had about 4.6 billion Vietnamese Dong (VND)[3] of sales in 2009. This number increased to 5.2 billion VND in 2013. The average value of total assets per firm was about 8 billion VND and did not change much from 2009 to 2013. The average annual wage per employee increased from about 35.6 million VND in 2009 to 38.3 million VND in 2013. The average investment per firm increased from 4 billion VND in 2009 to 5 billion VND in 2013. On average, each firm had 6 employees in each year and about 34% of the firms are private firms.

Panel 1B of Table 1 documents the real growth rates of these small firms in terms of sales, investment, sales per employee and the wage-to-sales ratio during the period 2009–2013. Except for the growth rate of the wage-to-sales ratio, all other growth rates are positive. The average growth rate of sales per firm is about 23% while the average growth rate of sales per worker/employee as a proxy of labour productivity,

Table 1. Characteristics and growth of small firms in Vietnam (< 20 employees).

	Panel 1A: Firm characteristics by year			
	2009		2013	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Sales (billion VND)	4.674	(18.527)	5.248	(19.215)
Asset (billion VND)	8.309	(22.695)	8.031	(17.780)
Wage (million VND/year)	35.661	(43.183)	38.354	(20.766)
Investment (billion VND)	4.053	(16.538)	5.217	(19.239)
No. of employees	6.573	(3.610)	5.816	(4.124)
Proportion of private firms	0.343	(0.475)	0.346	(0.476)
	Panel 1B: Firm growth over 2009–2013 period			
	Mean		Std. Dev.	
Growth of sales	0.230		2.038	
Growth of investment	0.249		2.261	
Growth of sales per employee	0.269		1.947	
Growth of wage-to-sales ratio	−0.173		1.979	

Monetary values are measured in constant 2009 Vietnam Dong (VND). In 2009, one US dollar equals to 17,065 VND (World Bank 2009). Total number of small firms is 34,537.

Table 2. Province and sector-level characteristics and financial development indicators.

Variables	2009		2013	
	Mean	Std. Dev	Mean	Std. Dev
Panel 2 A: Province characteristics (39 provinces)				
Province GDP (billion VND)	40,394.890	62,716.910	52,496.550	82,031.150
Province per capita income (million VND/capita)	21.981	27.056	27.499	34.391
Population of province (1,000 persons)	1,722.131	1,330.854	1,797.246	1,446.290
Size of province (km^2)	4,787.426	3,517.391	4,787.426	3,517.391
Population density (1,000 persons/ km^2)	0.576	0.622	0.602	0.669
No. of employees in small firms in province (1,000 employees)	195.660	374.022	257.966	491.010
Panel 2B: Sector characteristics (18 sectors)				
Sector value added per province (billion VND)	310.321	1,659.707	448.800	2,037.047
Sector employees per province (1,000 employees)	27.227	72.082	36.132	95.917
Average yearly wage per sector per province (million VND)	24.568	9.052	25.352	5.460
Panel 2 C: Local financial development indicators				
Number of financial suppliers per 1,000 persons (FD1)	0.021	0.021	0.027	0.024
Number of financial suppliers per 1 km^2 (FD2)	0.020	0.043	0.028	0.064

Monetary values are measured in constant 2009 Vietnam Dong (VND). In 2009, one US dollar equals to 17,065 VND (World Bank 2009). Number of provinces included in the analysis is 39. Number of sectors included in the analysis is 18. Total number of large firms for GO50 and GO100 is 37,068 and 21,366, respectively. Correlation coefficient between FD1 and FD2 is 0.805 and is significant at 1% significance level.

is about 26.9%. Similarly, the average growth rates of investment and of the wage-to-sales ratio are 24.9% and −17.3%, respectively. These descriptive statistics for the dependent variables of our analysis indicate that small firms had performed well during the time period 2009–2013.

Table 2 documents characteristics of the provinces and the sectors to which small firms belong. Panel 2 A of Table 2 shows that, for the 39 provinces included in our analysis, the provincial GDP had increased from an average of 40 billion VND in 2009 to about 52 billion VND in 2013. This makes the provincial per capita income to increase from about 22 million VND in 2009 to 27 million VND in 2013. Small firms also provide a significant share of employment in each province. Panel 2B of Table 2 presents the characteristics of the sector by province. On average, each sector had an added value per province of about 310 billion VND and 449 billion VND in 2009 and 2013, respectively. The number of employees in a sector in a province increased from about 27,000 to 36,000 from 2009 to 2013, with an average yearly wage of about 25 million VND.

Panel 2 C of Table 2 documents the descriptive statistics of the two financial development indicators: The number of financial suppliers per 1,000 persons (FD1), and the number of financial suppliers per square kilometre (FD2) in each province in 2009 and 2013. FD1 demonstrates the possible congestion in accessing finance at the provincial level in Vietnam. It is plausible to assume that a larger number of financial suppliers per capita in a province is associated with a lower level of competition for credit among small firms in the province, and hence reflects a higher degree of access to finance for small firms. Similarly, measuring local financial development by the number of financial suppliers per square kilometre would control for transaction costs in visiting financial suppliers. It would be easier for small firms to apply for credit if the density of financial suppliers in the province is higher. Panel 2 C shows that the values of these two indicators had increased during this time period. In addition, it also shows that these two indicators are highly correlated. As stated by the

Table 3. Characteristics of large firms used for identifying sectoral growth opportunities (GO) in Vietnam.

| | GO 50 | | | | GO 100 | | | |
| | 2009 | | 2013 | | 2009 | | 2013 | |
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Sales (billion VND)	80.027	141.391	89.883	121.749	111.219	165.296	119.305	135.976
Asset (billion VND)	112.945	529.941	132.853	625.169	163.433	655.679	166.156	639.441
Wage (million VND/year)	35.747	32.569	43.954	38.983	35.833	29.118	44.730	36.035
Investment (billion VND/year)	68.341	122.853	77.808	107.223	94.001	142.457	101.792	118.236
No. of employees	236.060	428.035	279.247	474.343	370.149	537.622	428.946	605.133
Proportion of private firms	0.674	0.469	0.627	0.484	0.565	0.496	0.516	0.500

Monetary values are measured in constant 2009 Vietnam Dong (VND). In 2009, one US dollar equals to 17,065 VND (World Bank 2009). Total number of large firms for GO50 and GO100 is 37,068 and 21,366, respectively.

World Bank (2018), financial sector development is fundamentally about overcoming costs incurred in the financial sector including the costs of acquiring information, enforcing contracts, and making transactions. Therefore, financial development occurs when the financial systems (instruments, markets and intermediaries) ease the effects of information, enforcement, and transactions costs. The World Bank's Global Financial Development Database identifies four dimensions including financial depth, financial access, financial efficiency and financial stability to measure financial development with respect to financial institutions and financial markets. Accordingly, our financial development indicators cover the dimension of financial access.[4]

Table 3 documents the descriptive statistics for those large firms, which are used to quantify sectoral GO. In comparison with small firms (see Table 1), large firms have larger annual sales, investment, assets, number of employees and annual wage per employee. Moreover, all indicators except for the share of private firms, such as sales, assets, investment and number of employees, have increased from 2009 to 2013, regardless of whether firms with more than 50 or 100 employees are considered large.

Table 4 provides a summary of GO as defined in (2) of 18 sectors based on our reference group of firms with more than 50 and 100 employees (GO50 and GO100, respectively). It shows that 15 out of 18 sectors have positive GO if we use GO50, while there are four sectors showing negative GO if we use GO100 (sectors F, H, L and S). This growth in GO is not unexpected for an emerging economy like Vietnam, where sectors have not grown to their full capacity. The growth opportunities GO50 of all sectors range from −0.371 to 0.439, with *manufacturing* having the highest and *other service activities* having the smallest growth opportunities. Moreover, the *manufacturing* sector and *other service activities* are characterized by the largest and smallest number of firms, respectively.

4. Empirical results

In this section, we discuss estimation results for the model in (3) of the impact of province-level financial development on the performance of firms as measured by the growth rates of sales (Table 5), investment (Table 6), sales per worker (Table 7) and wage-to-sales ratios (Table 8). Noting that the majority of Vietnamese enterprises are

Table 4. Growth opportunities (GO) at the sector level (using data of either firms with more than 50 employees (GO50) or firms with more than 100 employees (GO100) over 2009–2013 period.

Sector code	Sector name	GO50		GO100	
		No. of firms	Mean	No. of firms	Mean
A	Agriculture, forestry and fishing	1,228	0.121	540	0.104
B	Mining and quarrying	650	0.149	352	0.149
C	Manufacturing	17,060	0.439	11,272	0.451
D	Electricity, gas, steam and air conditioning supply	114	0.360	70	0.377
E	Water supply, sewerage and waste management	338	0.326	274	0.322
F	Construction	7,898	−0.050	4,308	−0.057
G	Wholesale, retail trade and repair vehicles	3,774	0.064	1,522	0.089
H	Transportation and storage	2,024	0.066	1,046	−0.006
I	Accommodation and food service activities	956	0.034	472	0.011
J	Information and communication	302	0.087	136	0.043
K	Financial and insurance activities	284	0.149	192	0.139
L	Real estate activities	340	−0.338	146	−0.433
M	Professional, scientific and technical activities	854	0.089	330	0.075
N	Administrative and support service activities	730	0.185	430	0.206
P	Education	126	0.257	70	0.266
Q	Human health and social work activities	164	0.405	88	0.385
R	Arts, entertainment and recreation	190	0.065	98	0.020
S	Other service activities	36	−0.371	20	−0.452
	Total number of firms	37,068		21,366	

With GO50, the 25th and 75th percentile are belong to sector G and sector P with growth opportunities of 0.064 and 0.257, respectively. Similarly, with GO100, the 25th and 75th percentile are belong to sector I and sector P with growth opportunities of 0.011 and 0.266, respectively.

small with less than 20 employees, we consider *GO50* to be more appropriate to proxy growth opportunities (specifications 1, 2, and 3) than *GO100* (specifications 4, 5, and 6). Our effect of interest is the interaction term between local financial development and growth opportunities. For each dependent variable, we begin with a parsimonious specification (specifications 1 and 4), and subsequently add more explanatory variables at the firm, sector and province levels. In specifications 2 and 5, we control if the firm is private (dummy variable '*Private*') and include the number of employees of the firm (variable '*Labour*'). In specifications 3 and 6, we control for the ratio of sector value added to the province in the total value added of the province (variable '*Share of sector value added/province value added*') and the ratio of sector employees in the province to the total population of the province (variable '*Share of sector labour/province population*'). Moreover, all specifications include province and sector fixed effects. Our discussions of estimation results are based on the full model specifications (specifications 3 and 6) as documented in Tables 5, 6, 7 and 8.

4.1. Sales growth

Table 5 documents the results on the effect of provincial financial development on sales growth of small firms. The results show that provincial financial development promotes the sales growth of small firms that are operating in sectors with strong growth opportunities. This finding confirms the result in Fafchamps and Schündeln (2013) who document a positive effect of commune-level financial development on growth rates of value added of firms. The positive sign of the interaction term between provincial financial development and growth opportunities indicates that the

Table 5. Effect of local financial development on sales growth of small firms in Vietnam.

	GO50			GO100		
	(1)	(2)	(3)	(4)	(5)	(6)
GO*FD1	0.569***	0.364**	0.364**	0.448***	0.258*	0.254*
	(0.163)	(0.163)	(0.169)	(0.133)	(0.135)	(0.139)
Sales	−0.373	−0.390	−0.389	−0.379	−0.397	−0.397
	(0.277)	(0.273)	(0.273)	(0.276)	(0.272)	(0.272)
Sales*FD1	0.064	0.062	0.062	0.061	0.060	0.060
	(0.062)	(0.061)	(0.061)	(0.062)	(0.060)	(0.060)
Private*FD1		−0.025**	−0.025**		−0.027**	−0.027***
		(0.009)	(0.009)		(0.010)	(0.010)
Private*GO		−0.374***	−0.380***		−0.367***	−0.374***
		(0.109)	(0.106)		(0.096)	(0.092)
Labour*GO		1.010***	1.013***		0.979***	0.982***
		(0.158)	(0.155)		(0.168)	(0.165)
Share of sector value added/province value added			0.001			0.005
			(0.012)			(0.013)
Share of sector labour/province population			−0.393*			−0.418**
			(0.215)			(0.193)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.648*	0.277	0.291	0.589	0.567	0.244
	(0.365)	(0.375)	(0.374)	(0.513)	(0.360)	(0.366)
Model statistics:						
No. of observations	34,537	34,537	34,537	34,537	34,537	34,537
R^2	0.311	0.314	0.314	0.314	0.311	0.314
Adjusted R^2	0.310	0.313	0.313	0.313	0.310	0.313
Differential in growth rates	0.136	0.087	0.087	0.087	0.141	0.081

Variables *Sales* and *Labour* are in natural logarithms. *FD1* is the number of financial suppliers per 1,000 persons at the province level and in natural logarithms. *GO* denotes *GO50* for specifications (1)-(3) and GO100 for specifications (4)-(6). The differential in growth rates shows the difference in growth rates between firms in sector *P (Education)*, at the 75th percentile of the growth opportunities *GO50 (GO100)* distribution, and firms in sector *G* (*whole sales, retail trade and repair vehicles*) or sector *I* (*accommodation and food service activities*), at the 25th percentile of the growth opportunities *GO50 (GO100)* distribution, if these firms are located in *Nam Dinh* province instead of *Thua Thien Hue*, which are at the 75th and 25th percentiles of financial development distribution, respectively. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

difference between growth in sectors with better growth opportunities and growth in sectors with less favorable growth opportunities is larger in provinces with higher financial development than in provinces with lower financial development. For instance, as shown in the last row of Table 5, we compare the differences in growth rates between a firm in sector *P* at the 75th percentile of the *GO50* distribution (which is the *education* sector with *GO50* = 0.257) and a firm in sector *G* at the 25th percentile of *GO50* distribution (which is the *wholesale, retail trade and repair vehicles* sector with *GO50* = 0.064) when these firms are located in different localities (*Nam Dinh* province instead of *Thua Thien Hue*). The difference in growth rates of sales is about 8.7% larger if these firms are located in *Nam Dinh*, which is at the 75th percentile of the financial development distribution, instead of *Thua Thien Hue*, which is at the 25th percentile of the financial development distribution.[5] With regard to *GO100*, the difference in growth rates between firms in sector *P (education)* and sector *I (accommodation and food service activities)* increases by 8.1% if they are located in *Nam Dinh* instead of *Thua Thien Hue*.

Adding more control variables, the magnitude of the interaction between financial development and growth opportunities remains qualitatively the same. As a result,

Table 6. Effect of local financial development on investment growth of small firms in Vietnam.

	GO50			GO100		
	(1)	(2)	(3)	(4)	(5)	(6)
GO*FD1	0.699***	0.503**	0.520**	0.569***	0.387**	0.400**
	(0.197)	(0.189)	(0.196)	(0.174)	(0.162)	(0.171)
Investment	−0.309	−0.328	−0.326	−0.317	−0.336	−0.335
	(0.238)	(0.237)	(0.237)	(0.237)	(0.236)	(0.236)
Investment*FD1	0.080	0.078	0.078	0.077	0.075	0.076
	(0.054)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)
Private*FD1		−0.019***	−0.019***		−0.021***	−0.021***
		(0.007)	(0.006)		(0.006)	(0.006)
Private*GO		−0.299	−0.305*		−0.316*	−0.324*
		(0.184)	(0.180)		(0.165)	(0.161)
Labour*GO		1.073***	1.077***		1.031***	1.035***
		(0.215)	(0.209)		(0.214)	(0.209)
Share of sector value added/province value added			−0.011			−0.007
			(0.012)			(0.013)
Share of sector labour/province population			−0.748***			−0.776***
			(0.200)			(0.178)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.245	−0.123	−0.079	0.152	−0.166	−0.126
	(0.447)	(0.469)	(0.469)	(0.440)	(0.456)	(0.456)
Model statistics:						
No. of observations	34,537	34,537	34,537	34,537	34,537	34,537
R^2	0.258	0.261	0.261	0.258	0.261	0.261
Adjusted R^2	0.257	0.260	0.260	0.257	0.260	0.260
Differential in growth rates	0.167	0.120	0.124	0.179	0.122	0.126

Variables *Sales* and *Labour* are in natural logarithms. *FD1* is the number of financial suppliers per 1,000 persons at the province level and in natural logarithms. *GO* denotes *GO50* for specifications (1)-(3) and *GO100* for specifications (4)-(6). The differential in growth rates shows the difference in growth rates between firms in sector P (education), at the 75th percentile of the growth opportunities *GO50 (GO100)* distribution, and firms in sector G (*whole sales, retail trade and repair vehicles*) or sector I (*accommodation and food service activities*), at the 25th percentile of the growth opportunities *GO50 (GO100)* distribution, if these firms are located in *Nam Dinh* province instead of *Thua Thien Hue*, which are at the 75th and 25th percentiles of financial development distribution, respectively. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

the differentials in sales growth rates are stable and positive at about 8%. Moreover, the effect of the initial value of sales (sales in 2009) is negative but insignificant when using *GO50* and *GO100*, and is consistent with findings in Fafchamps and Schündeln (2013). The initial value is included to control for the convergence effect that growth is likely higher for relatively small firms than for firms with a relatively high level of sales. In addition, the interaction between financial development and the initial value of sales does not show a significant impact on sales growth. In specifications (2) and (5), we include firm-level explanatory variables, interacting them with growth opportunities and province-level financial development. The results show that the more labour a firm employs, the faster its sales grow. Moreover, we find that government- or foreign-owned firms are more likely to take advantage of financial development and growth opportunities.

To control for the impact of sector-specific characteristics, we include the share of value added of each sector to the total value added of the province and the share of labour in each sector to the total population of the province. The results in specifications (3) and (6) reveal that while the former does not show a significant impact on sales growth, the latter has a significantly negative impact on sales growth.

Table 7. Effect of local financial development on growth of sales per worker of small firms in Vietnam.

	GO50			GO100		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
GO*FD1	0.435***	0.277**	0.287**	0.316***	0.179*	0.184*
	(0.121)	(0.120)	(0.126)	(0.096)	(0.096)	(0.100)
Salepw	−0.656**	−0.651**	−0.651***	−0.662***	−0.658***	−0.658***
	(0.243)	(0.240)	(0.240)	(0.242)	(0.240)	(0.239)
Salepw*FD1	0.005	0.007	0.008	0.003	0.005	0.005
	(0.053)	(0.052)	(0.052)	(0.053)	(0.052)	(0.052)
Private*FD1		−0.037***	−0.037***		−0.037***	−0.037***
		(0.011)	(0.010)		(0.010)	(0.010)
Private*GO		−0.278*	−0.282*		−0.227*	−0.232**
		(0.147)	(0.142)		(0.113)	(0.108)
Labour*GO		0.806***	0.809***		0.766***	0.768***
		(0.035)	(0.033)		(0.036)	(0.034)
Share of sector value added/province value added			−0.006			−0.003
			(0.011)			(0.011)
Share of sector labour/province population			−0.448*			−0.458*
			(0.236)			(0.237)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	8.089***	7.804***	7.832***	8.019***	7.780***	7.803***
	(1.142)	(1.125)	(1.131)	(1.148)	(1.130)	(1.136)
Model statistics:						
No. of observations	34,537	34,537	34,537	34,537	34,537	34,537
R^2	0.409	0.411	0.411	0.409	0.411	0.411
Adjusted R^2	0.408	0.410	0.410	0.408	0.410	0.410
Differential in growth rates	0.104	0.066	0.068	0.100	0.056	0.058

Variable *Salepw* refers to Sales per worker and in natural logarithms. Variable *Labour* is in natural logarithms. *FD1* is the number of financial suppliers per 1,000 persons at the province level and measured in natural logarithms. *GO* denotes *GO50* for specifications (1)-(3) and *GO100* for specifications (4)-(6). The differential in growth rates shows the difference in growth rates between firms in sector *P (education)*, at the 75th percentile of the growth opportunities *GO50 (GO100)* distribution, and firms in sector *G (whole sales, retail trade and repair vehicles)* or sector *I (Accommodation and food service activities)*, at the 25th percentile of the growth opportunities *GO50 (GO100)* distribution, if these firms are located in *Nam Dinh* province instead of *Thua Thien Hue*, which are at the 75th and 25th percentiles of financial development distribution, respectively. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

4.2. Investment growth

Results documented in Table 6 show that provincial financial development promotes investment growth of firms irrespective of using *GO50* or *GO100* as proxies for growth opportunities. These results are similar to findings in O'Toole and Newman (2017) although they do not control for growth opportunities and their measures of financial development are different from ours. Similar to results shown in Table 5, the differential in growth rates is positive. In particular, the difference between growth rates of firms in the *education* sector and firms in the *whole sale, retail trade and repair vehicle* sector (when using *GO50*) or firms in the *accommodation and food service activities* sector (when using *GO100*) are, respectively, 12.0% or 11.0% larger if firms in these sectors are located in *Nam Dinh* instead of *Thua Thien Hue*.

With regard to other control variables, the effects of the interaction term between local financial development and growth opportunities are qualitatively the same as in specifications (3) and (6) (with more control for local and sector development). With respect to the convergence effect, the initial value enters insignificantly in all

Table 8. Effect of local financial development on growth of wage-to-sales ratio of small firms in Vietnam.

	GO50			GO100		
	(1)	(2)	(3)	(4)	(5)	(6)
GO*FD1	−0.353***	−0.212**	−0.229*	−0.217**	−0.096	−0.109
	(0.095)	(0.104)	(0.114)	(0.084)	(0.090)	(0.095)
Wagets	−0.672***	−0.666***	−0.662***	−0.677***	−0.671***	−0.667***
	(0.238)	(0.234)	(0.234)	(0.238)	(0.235)	(0.234)
Wagets *FD1	0.002	0.005	0.007	0.000	0.003	0.005
	(0.052)	(0.051)	(0.051)	(0.052)	(0.051)	(0.051)
Private*FD1		0.042***	0.042***		0.042***	0.042***
		(0.013)	(0.013)		(0.012)	(0.012)
Private*GO		0.216	0.237		0.178	0.198*
		(0.158)	(0.149)		(0.121)	(0.112)
Labour*GO		−0.751***	−0.760***		−0.711***	−0.720***
		(0.043)	(0.033)		(0.041)	(0.033)
Share of sector value added/province value added			0.010			0.005
			(0.012)			(0.012)
Share of sector labour/province population			1.685***			1.691***
			(0.397)			(0.367)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−6.416***	−6.131***	−6.208***	−6.346***	−6.104***	−6.176***
	(0.803)	(0.795)	(0.795)	(0.802)	(0.794)	(0.794)
Model statistics:						
No. of observations	34,537	34,537	34,537	34,537	34,537	34,537
R^2	0.416	0.418	0.419	0.416	0.418	0.419
Adjusted R^2	0.415	0.417	0.418	0.415	0.417	0.417
Differential in growth rates	−0.084	−0.051	−0.055	−0.068	−0.030	−0.034

Variable *Wagets* represents wage-to-sales ratio and in natural logarithms. Variable *Labour* is in natural logarithms. *FD1* is the number of financial suppliers per 1,000 persons at the province level and in natural logarithms. *GO* denotes *GO50* for specifications (1)-(3) and *GO100* for specifications (4)-(6). The differential in growth rates shows the difference in growth rates between firms in sector *P (education)*, at the 75th percentile of the growth opportunities *GO50 (GO100)* distribution, and firms in sector *G (whole sales, retail trade and repair vehicles)* or sector *I (Accommodation and food service activities)*, at the 25th percentile of the growth opportunities *GO50 (GO100)* distribution, if these firms are located in *Nam Dinh* province instead of *Thua Thien Hue*, which are at the 75th and 25th percentiles of financial development distribution, respectively. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

specifications. Moreover, the interaction term between the initial value of investment and provincial financial development carries a positive sign. This shows that in provinces with higher financial development, firms with higher initial investment tend to experience faster investment growth than firms with lower initial investment. However, the coefficient on the initial value of investment is not statistically significant.

Furthermore, the more labour a firm employs, the higher is its investment growth. We also find that firms owned by the government or foreigners are better positioned to take advantage of provincial financial development and growth opportunities than private firms. This might be related to the fact that the majority of financial institutions are owned by the government, which could favor state-owned firms over private firms. The result that foreign-owned firms tend to grow faster than private firms is consistent with the results in Beck, Demirgüç-Kunt, and Maksimovic (2005). Regarding the province and sector level characteristics, we do not find significant effects of the share of sector value added to total value added of the province on investment growth.

4.3. Sales per worker

The results documented in Table 7 reveal that the difference in growth rates of sales per worker between firms in sector *P (Education)* and firms in sector *G (Wholesale, retail trade and repair vehicles)* (if using *GO50*) is about 6.8% larger if these firms are located in *Nam Dinh* instead of *Thua Thien Hue*. The corresponding growth differential is about 5.8% between firms in sector *P (Education)* and firms in sector *I (Accommodation and food service activities)* when we use *GO100*. It is noteworthy that the initial condition (*Salepw*) has a negative impact on the growth rate of sales per worker in all specifications. This reflects the convergence effect that large firms tend to grow slower than small firms. The effects of other control variables including *Labour*, and *Private* are similar to the previous results for growth of sales and investment. Most importantly, the effect represented by the interaction term between *financial development* and *growth opportunities* barely changes when we control for firm, sector and province characteristics.

4.4. Wage-to-sales ratio

Table 8 presents results on the determinants of the growth rate of the wage-to-sales ratio. We view this ratio as an inverse measure of labour productivity, because if labour productivity lowers costs, it is plausible to expect that wages per worker will rise less than sales per worker, so that wages per sales will fall (Fafchamps and Schündeln 2013). For example, the wage-to-sales ratio is a simple accounting calculation that allows a retail business to determine the value of its workforce as a function of its revenue. Higher wage-to-sales ratios could mean that the sales staff is performing poorly or having difficulties in selling the products. In general, a decline in this indicator points to higher productivity and thus better firm performance.

Consistent with results documented in Tables 5, 6 and 7, the coefficient for the interaction between local financial development and growth opportunities is negative and statistically significant in all but one of the specifications. This shows that provincial financial development helps firms to reduce the cost of labour per unit of sales. The last row of Table 8 reports the difference in growth rates of the wage-to-sales ratio between firms in sectors at the 25th and 75th percentiles of the growth opportunities distribution when these firms operate in the same sectors but are located in provinces with better financial development. The differential growth rate is −5.5% (using *GO50*) and −3.4% (using *GO100*), showing that operating in localities with higher financial development helps firms to further reduce labour cost per unit of sales. Moreover, the initial condition (*Wagets*) has a negative impact on the growth rate of the wage-to-sales ratio in all specifications. This reflects the fact that larger firms are more efficient than smaller firms. The significantly positive effect of *Private* indicates that firms owned by the government or foreigners are more effective in reducing the costs of labour in generating sales. Moreover, the significant and negative impact of *Labour* on the wage-to-sales ratio implies that larger firms control more effectively the labour cost. The effects of the interaction between FD and GO remain significant and negative after controlling for firm, sector and provincial characteristics.

4.5. Robustness check

We perform a robustness check for our estimation results by replacing the number of financial suppliers per 1,000 persons (*FD1*) by the number of financial suppliers per square kilometre (*FD2*). As shown in Table 2, these two financial development indicators are positively correlated, with a correlation coefficient of 0.805. Robustness results documented in Appendices D1, D2, D3 and D4 largely confirm the estimation results presented in Tables 5, 6, 7 and 8. More specifically, the results in these appendices show that provincial financial development enhances the performance of small firms in terms of increasing the growth rates of sales and investment. Local financial development also promotes productivity of labour as shown by its positive impact on the growth rate of sales per worker and its negative effect on the growth rates of the wage-to-sales ratio. Additional specifications were considered in which *GO* and *FD* were included separately along with other control variables. Results of these additional specifications are documented in Appendices E1, E2, E3 and E4 and show that the coefficient of the interaction term (FD*GO) remains qualitatively similar to the results presented in Tables 5, 6, 7 and 8.

5. Conclusion

In this paper, we examined whether local financial development promotes the performance of small firms in Vietnam using an extensive firm-level survey conducted in 2009 and 2013. In order to address the potential endogeneity problem arising from the possibility that the growth of firms may be due to the effect of sectoral growth opportunities rather than financial development, we calculate growth opportunities in each sector based on the performance of large firms and investigate if financial suppliers extend more credit to sectors with better growth opportunities. Moreover, we measure local financial development at the province level based on the number of financial suppliers per 1000 people in each province. Interacting local financial development with growth opportunities, we investigate the effects of local financial development on firm performance as measured by the growth rates of sales, investment, sales per worker and the wage-to-sales ratio.

Our results show that in sectors with growth opportunities, provincial financial development has a significantly positive impact on the growth rates of small firms in terms of sales, investment, and sales per worker, while it has a significantly negative impact on the growth rates of the wage-to-sales ratio. Therefore, small firms in sectors with strong growth opportunities tend to improve their performance preferably when they operate in locations with higher levels of financial development. Our results suggest that besides improving other conditions such as enhancing the legal and institutional framework, local infrastructure and improving the linkages among markets, policy makers should consider increasing the number of financial suppliers at the province level as a means of enhancing access to finance to promote firm performance.

Our study can be extended in several directions. First, given that we have only firm-level data for 2009 and 2013 and the number of the provinces included in the analysis is only 39, a long-term panel data that covers more provinces and sectors

could provide further insights. Second, as the present study considers only the access dimension of financial development, one could also examine in a future study if variations in the efficiency and depth of local financial systems are also important determinants of firm growth in Vietnam and other developing economies.

Notes

1. The VES is a dataset at the firm-level capturing information about all firms with more than 30 employees and a sample of firms with less than 30 employees across all 64 provinces in Vietnam. It covers all sectors such as agriculture, manufacturing, and services. This survey also provides, for instance, information on firm performance, assets, investment, legal status, and ownership (state-owned, foreign-owned, and private).
2. Further discussion on alternative local financial development indicators can be found in Fafchamps and Schündeln (2013).
3. In 2009, one US dollar equals to 17,065 Vietnamese Dong (World Bank 2009).
4. For further discussion on the different dimensions of financial development, please follow the link: https://www.worldbank.org/en/publication/gfdr/gfdr-2016/background/financial-development.
5. We calculate growth differentials as $\beta_i*(FD_{nd}-FD_t)(GO_2 - GO_1)$, where FD_{nd} and FD_t represent financial development in *Nam Dinh* and *Thua Thien Hue* provinces, respectively; and GO_1 and GO_2 denote growth opportunities of sectors at the 25th and 75th percentiles of the distribution of growth opportunities. This idea of highlighting the effect of local financial development in terms of growth differentials is taken from Fafchamps and Schündeln (2013).
6. We thank an anonymous reviewer for raising this issue. For further discussion, please follow the link: https://www.vietnam-briefing.com/news/facilitating-sme-growth-vietnam.html

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

ORCID

Trung Thanh Nguyen 🟢 http://orcid.org/0000-0003-4507-724X

References

An, T. H. T, and K.-C. Yeh. 2021. "Growth Effect of Foreign Direct Investment and Financial Development: New Insights from a Threshold Approach." *Journal of Economics and Development* 23 (2): 144–162. doi:10.1108/JED-08-2020-0108.

Aghion, P., T. Fally, and S. Scarpetta. 2007. "Credit Constraints as a Barrier to the Entry and Post-Entry Growth of Firms." *Economic Policy* 22 (52): 732–779. doi:10.1111/j.1468-0327.2007.00190.x.

Alhassan, A., M. S. Adamu, and S. S. Safiyanu. 2021. "Finance-Led Growth Hypothesis for Asia: An Insight from New Data." *Journal of the Asia Pacific Economy,/italic>* : 1–20. doi:10.1080/13547860.2021.1912883.

Andersen, T. B, and F. Tarp. 2003. "Financial Liberalization, Financial Development and Economic Growth in LDCs." *Journal of International Development* 15 (2): 189–209. doi:10.1002/jid.971.

Ang, J. B, and W. J. McKibbin. 2007. "Financial Liberalization, Financial Sector Development and Growth: Evidence from Malaysia." *Journal of Development Economics* 84 (1): 215–233. doi:10.1016/j.jdeveco.2006.11.006.

Beck, T, and R. Cull. 2014. "Small-and Medium-Sized Enterprise Finance in Africa." *Global Economy and Development Program* 16: 1–28.

Beck, T., A. Demirgüç-Kunt, and V. Maksimovic. 2005. "Financial and Legal Constraints to Growth: Does Firm Size Matter?" *The Journal of Finance* 60 (1): 137–177. doi:10.1111/j.1540-6261.2005.00727.x.

Jung, S, and H. Cha. 2021. "Financial Development and Income Inequality: Evidence from China." *Journal of the Asia Pacific Economy* 26 (1): 73–95. doi:10.1080/13547860.2020.1717301.

Dehejia, R, and A. Lleras-Muney. 2007. "Financial Development and Pathways of Growth: State Branching and Deposit Insurance Laws in the United States, 1900-1940." *The Journal of Law and Economics* 50 (2): 239–272. doi:10.1086/511322.

Demetriades, P. O, and G. A. James. 2011. "Finance and Growth in Africa: The Broken Link." *Economics Letters* 113 (3): 263–265. doi:10.1016/j.econlet.2011.08.007.

Demirguc-Kunt, A., I. Love, and V. Maksimovic. 2006. "Business Environment and the Incorporation Decision." *Journal of Banking & Finance* 30 (11): 2967–2993.), doi:10.1016/j.jbankfin.2006.05.007.

Evans, D. S. 1987. "The Relationship between Firm Growth, Size, and Age: Estimates for 100 Manufacturing Industries." *The Journal of Industrial Economics* 35 (4): 567–581. doi:10.2307/2098588.

Fafchamps, M, and M. Schündeln. 2013. "Local Financial Development and Firm Performance: Evidence from Morocco." *Journal of Development Economics* 103: 15–28. doi:10.1016/j.jdeveco.2013.01.010.

Fisman, R, and I. Love. 2007. "Financial Dependence and Growth Revisited." *Journal of the European Economic Association* 5 (2–3): 470–479. doi:10.1162/jeea.2007.5.2-3.470.

Fisman, R, and J. Svensson. 2007. "Are Corruption and Taxation Really Harmful to Growth? Firm Level Evidence." *Journal of Development Economics* 83 (1): 63–75. doi:10.1016/j.jdeveco.2005.09.009.

Goldsmith, R. W. 1969. *Financial Structure and Development*. New Haven and London: Yale University Press.

Guiso, L., P. Sapienza, and L. Zingales. 2004. "Does Local Financial Development Matter?" *The Quarterly Journal of Economics* 119 (3): 929–969. doi:10.1162/0033553041502162.

Halkos, G. E, and N. G. Tzeremes. 2007. "Productivity Efficiency and Firm Size: An Empirical Analysis of Foreign Owned Companies." *International Business Review* 16 (6): 713–731. doi:10.1016/j.ibusrev.2007.06.002.

Halkos, G. E, and N. G. Tzeremes. 2012. "Industry Performance Evaluation with the Use of Financial Ratios: An Application of Bootstrapped DEA." *Expert Systems with Applications* 39 (5): 5872–5880. doi:10.1016/j.eswa.2011.11.080.

Hartmann, M., H. Herwartz, and Y. M. Walle. 2012. "Where Enterprise Leads, Finance Follows. In-Sample and out-of-Sample Evidence on the Causal Relation between Finance and Growth." *Economics Bulletin* 32 (1): 871–882.

Herwartz, H, and Y. M. Walle. 2014. "Determinants of the Link between Financial and Economic Development: Evidence from a Functional Coefficient Model." *Economic Modelling* 37: 417–427. doi:10.1016/j.econmod.2013.11.029.

Ho, S., T. Nguyen, and T. Nguyen. 2021. "On the (a)Symmetric Effects of Real Exchange Rate on Trade Flows: new Evidence from US-Vietnam Trade Balance at the Industry Level." *Journal of the Asia Pacific Economy* 1–23. doi:10.1080/13547860.2021.1884346.

Jalil, A, and M. Feridun. 2011. "Impact of Financial Development on Economic Growth: empirical Evidence from Pakistan." *Journal of the Asia Pacific Economy* 16 (1): 71–80. doi: 10.1080/13547860.2011.539403.

King, R. G, and R. Levine. 1993. "Finance and Growth: Schumpeter Might Be Right." *The Quarterly Journal of Economics* 108 (3): 717–737. doi:10.2307/2118406.

Levine, R. 2005. "Finance and Growth: Theory and Evidence." In *Handbook of Economic Growth 1A*, edited by Aghion, P., Durlauf, S. N, 865–934. Amsterdam: Elsevier North-Holland.

Levine, R., N. Loayza, and T. Beck. 2000. "Financial Intermediation and Growth: Causality and Causes." *Journal of Monetary Economics* 46 (1): 31–77. doi:10.1016/S0304-3932(00)00017-9.

Lucas, R. E. 1988. "On the Mechanics of Economic Development." *Journal of Monetary Economics* 22 (1): 3–42. doi:10.1016/0304-3932(88)90168-7.

McKinnon, R. I. 1973. *Money and Capital in Economic Development*. Washington, DC: Brookings Institution.

Nguyen, M. 2009. "Dynamic Demographics and Economic Growth in Vietnam." *Journal of the Asia Pacific Economy* 14 (4): 389–398.

Nguyen, T., T. T. Nguyen, and U. Grote. 2020. "Credit and Ethnic Consumption Inequality in the Central Highlands of Vietnam." *Social Indicators Research* 148 (1): 143–172. doi:10.1007/s11205-019-02202-z.

Nguyen, T. T., T. Tran, T.-T. Nguyen, and U. Grote. 2021. "Farming Efficiency, Cropland Rental Market and Income Effect: Evidence from Panel Data for Rural Central Vietnam." *European Review of Agricultural Economics* 48: 207–248.

O'Toole, C, and C. Newman. 2017. "Investment Financing and Financial Development: Evidence from Viet Nam." *Review of Finance* 21 (4): 1639–1674.

Patrick, H. 1966. "Financial Development and Economic Growth in Underdeveloped Countries." *Economic Development and Cultural Change* 14 (2): 174–189. doi:10.1086/450153.

Petersen, M. A, and R. G. Rajan. 2002. "Does Distance Still Matter? The Information Revolution in Small Business Lending." *The Journal of Finance* 57 (6): 2533–2570. doi:10.1111/1540-6261.00505.

Pham, H., A. Nguyen, and A. Johnston. 2022. "Economic Policies and Technological Development of Vietnam's Electronics Industry." *Journal of the Asia Pacific Economy* 27 (2): 248–269. doi:10.1080/13547860.2020.1809055.

Rajan, R. G, and L. Zingales. 1998. "Financial Dependence and Growth." *American Economic Review* 88 (3): 559–586.

Robinson, J. 1952. "*The Generalization of the General Theory*.". In: *The Rate of Interest and Other Essays*. London: MacMillan.

Schumpeter, J. A. 1911. *The Theory of Economic Development*. Cambridge: Harvard University Press.

Shaw, E. 1973. *Financial Deepening in Economic Development*. New York: Oxford University Press.

Tran, B. T., B. Ong, and S. Weldon. 2015. Vietnam banking industry report. Duxton Asset Management Report. Retrieved from http://www.duxtonam.com/wpcontent/uploads/2015/01/Vietnam-Banking-Report_2015.pdf (accessed: 10 March, 2021).

Tran, V. T., Y. M. Walle, and H. Herwartz. 2018. "Local Financial Development and Household Welfare in Vietnam: Evidence from a Panel Survey." *The Journal of Development Studies* 54 (4): 619–640. doi:10.1080/00220388.2017.1385772.

Tran, V. T., T. T. Nguyen, and M. N. Tran. 2019. "Gender Difference in Access to Local Finance and Firm Performance: Evidence from a Panel Survey in Vietnam." *Economic Analysis and Policy* 63: 150–164. doi:10.1016/j.eap.2019.05.004.

Tran, V. T., Y. M. Walle, and H. Herwartz. 2020. "The Impact of Local Financial Development on Firm Growth in Vietnam: Does the Level of Corruption Matter?" *European Journal of Political Economy* 62: 101858. doi:10.1016/j.ejpoleco.2020.101858.

World Bank. 1989. *Financial Systems and Development*. Oxford: Oxford University Press.

Bank, World 2014. Vietnam - Financial sector assessment. Financial sector assessment program (FSAP). Washington, DC; World Bank Group http://documents.worldbank.org/curated/en/216401468329363389/VietnamFinancial-sector-assessment (accessed: 10 March, 2021).

World Bank. 2018. *Vietnam's Future Jobs: Leveraging Megatrends for Greater Prosperity*. Washington, DC: World Bank.

World Bank. 2009. Vietnam development report 2010: Modern institutions. Joint Donor Report to the Vietnam Consultative Group Meeting, Hanoi, December 3–4, 2009. Hanoi.

VGSO (General Statistics Office of Vietnam). 2020. Vietnam Business White Paper. Hanoi: Statistical Publisher (in Vietnamese).

VSIC (Vietnam Standard Industrial Classification). 2007. Viet Nam Standard Industrial Classification. Hanoi.

Yu, J., F. Peng, X. Shi, and L. Yang. 2022. "Impact of Credit Guarantee on Firm Performance: Evidence from China's SMEs." *Economic Analysis and Policy* 75: 624–636. doi:10.1016/j.eap.2022.06.017.

Appendix A. Background information: overview of the Vietnamese financial sector

As our focus is on Vietnam, this section provides an overview of the Vietnamese financial system and discusses the state of the small and medium enterprises in Vietnam.

A1. Financial sector development in Vietnam

Located in Southeast Asia, Vietnam is known for its rapid economic growth during the last several years. Prior to the commencement of the renovation policy package known as *Doi Moi* in 1986, the Vietnamese economy was agriculture-based and dominated by a system of state-owned firms. This centralist system was similar to that in other former socialist countries. In this system, the state bank acted as a single-tier bank. The State Bank of Vietnam provided almost all domestic banking services including the issuance of money as a central bank and raising and lending funds as a commercial bank. The state bank also controlled two specialized banks, namely, the Bank for Investment and Development of Vietnam (BIDV) and the Bank of Foreign Trade of Vietnam (Vietcombank). Established in 1957, the BIDV was in charge of providing long-term capital to public expenditure and infrastructure projects. Meanwhile, the Vietcombank was founded in 1963 and was responsible for financing foreign trade, managing financial exchange and supporting the system of state-owned firms. The centrally-planned economic system turned Vietnam into one of the five poorest economies in the world in 1985, forcing the country to commence the *Doi Moi* renovation policy in 1986 and to begin the transition towards a market-oriented economy (Nguyen et al. 2021).

Accordingly, in the financial sector, the State Bank of Vietnam has changed to function as the central bank only, while the state-owned commercial banks act as commercial banks. In addition, the government established two more commercial banks, namely, the Vietnam Bank for Agriculture and Rural Development (Agribank) and the Industrial and Commercial Bank of Vietnam (Vietinbank). More importantly, the renovation policies also allowed private entities to borrow and raise funds. This has led to the establishment of credit funds and credit cooperatives later known as People's Credit Funds. A number of foreign banks were also allowed to operate and open branches in Vietnam. Generally, even though the reform policies of the financial sector have been implemented with different levels of success in different provinces of the country

(World Bank 2014), they have contributed to economic growth of Vietnam. The per capita gross domestic product (GDP) measured in constant 2010 PPP US$ increased from about 900 US$ in 1990 to about 6,700 US$ in 2017 (Nguyen, Nguyen, and Grote 2020).

After various reforms, the Vietnamese financial sector is large by lower middle-income economy standards, with total assets amounting to 200% of GDP in 2011 (World Bank 2014). The sector is still dominated by a small number of large banks, with non-bank financial institutions accounting for only 8% of financial institution assets in 2011. As of 2014, the banking sector in Vietnam comprised five state-owned commercial banks, 33 joint stock commercial banks, five joint venture banks and five entirely foreign-owned banks (Tran, Ong, and Weldon 2015). Total assets of the banking sector amounted to 183% of GDP, and accounted for 92% of financial institutions' assets (World Bank 2014). Among those banks, the Agribank had the largest operating networks with around 2,400 branches and units nationwide. Vietinbank, BIDV, and Vietcombank had, respectively, about 1123, 725 and 328 branches and units (Tran, Ong, and Weldon 2015). Despite subsequent reforms to liberalize the financial sector, the banking sector is still dominated by the government. The five state-owned commercial banks accounted for almost 40 percent of the banking sector's assets and 48 percent of deposits in 2011. The state holds also shares in several joint venture banks (World Bank 2014). As Figures 1 and 2 shows, Vietnam's banking sector development as measured by the percentage of domestic credit to the private sector is around 100%. However, in comparison with other countries in the region, this indicator of Vietnam is lower than that of China, Malaysia and Thailand, but higher than that of Cambodia and Laos. While other countries show an increasing trend in the percentage of domestic credit to the private sector, this trend is not observed in Vietnam (and Laos).

Another indicator for financial development within a country is the number of bank branches, either per population or per land area. With slightly more than three bank branches per 100,000 adults, however, access to finance in Vietnam lags significantly behind regional levels, where, for instance, Malaysia and Thailand have more than 10 bank branches per 100,000 adults. Vietnam has a small but growing equity market, with a capitalization rate of about 19% of GDP in 2011 (World Bank 2014). The two stock exchanges, the Ho Chi Minh Stock Exchange (HSX) and Hanoi Stock Exchange (HNX) were established in 2000 and 2005, respectively, with more than 700 listed companies by the middle of 2016. Finance companies are the largest non-bank financial institutions in Vietnam. However, they account for only a small proportion of GDP and total assets of financial institutions. In 2014, this figure was 6% of GDP and 3% of assets of all financial institutions. The other notable non-bank financial institutions include insurance companies and mutual funds, constituting 4% and less than 1%
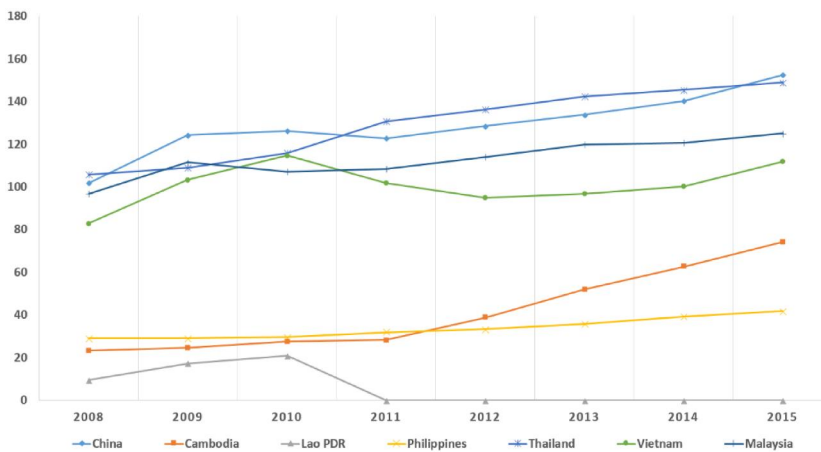
Figure 1. Domestic credit to private sector measured as the share of GDP of Vietnam and some other Asian economies (Source: World Bank, 2018).
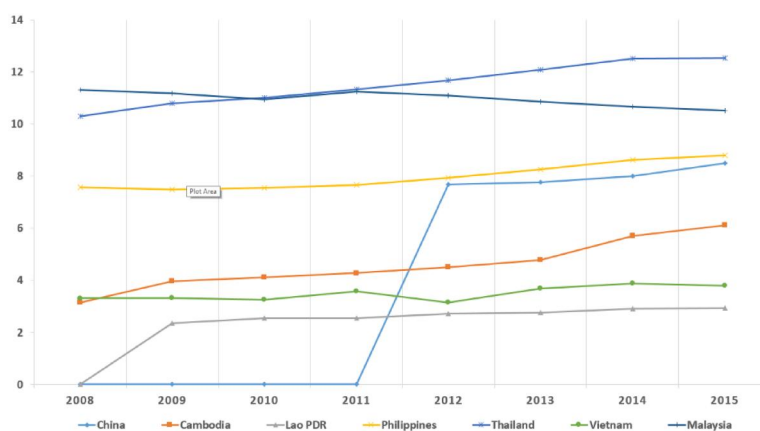
Figure 2. The number of commercial bank branches per 100,000 adults in Vietnam and some other Asian economies (Source: World Bank, 2018).

of GDP (World Bank 2014), respectively. These limitations have made the World Bank (2018) to call for further reforms in the financial sector in general and in the banking sector in particular. Obviously, evidence of the effects of local financial development on economic growth could be considered as crucial to support this call.

Vietnam is divided into 63 provinces and municipalities (cities), which differ in several aspects, especially with regard to the economic situation. Ho Chi Minh City is the biggest administrative unit in terms of the population and has the highest regional GDP per capita, while Dien Bien, Son La and Lai Chau provinces in the northern uplands have the lowest regional GDP per capita. The local governments of the 63 administrative units have a certain authority to promote economic growth within their territory. This includes, for example, the agreement for the establishment of bank branches and the operation of People's Credit Funds and finance companies (hereafter referred to as credit suppliers). The development of the financial system in general and the banking system in particular has been gradual and is not homogenous over provinces and municipalities, with Ho Chi Minh City and Hanoi Capital being most advanced as compared with other municipalities and provinces.

A2. Small and medium enterprises in Vietnam

Launched in 1986, the renovation policies of Vietnam have also established a legal framework for the establishment of private firms and businesses (hereafter referred to as firms) which did not exist in the previous period of central planning. Given the history of the socialist system, private firms were only officially recognized after the renovation. According to the VGSO (General Statistics Office of Vietnam) (2020) there were about 760,000 active firms in Vietnam by the end of 2019, an increase of about 6.1% as compared with the end of 2018. This increase is also not regionally homogeneous with 27 provinces and municipalities showing an increase in excess of the national average. On average, there were 7.9 firms per 1,000 persons nationwide. This number was 26.5 in Ho Chi Minh City while it was only 1.4 in Son La and Ha Giang provinces - the two poorest provinces in the country. According to the World Bank (2018), small (less than 20 employees) and medium firms (from 20 to 100 employees) account for 98% of the total number of firms and contribute to 40% of GDP and 50% of employment. Most small firms operate within a province (World Bank 2018). Thus, the development of the financial sector at the provincial level is expected to be crucial in providing access to finance to small firms. It is worth to note that the growth of firms is also affected by many other determinants, including administrative procedures (tax and accounting), the linkages among firms in the same or close sectors (production space and value chain), the level of

implementation of technology, government policies, and especially credit access. Within this context, examining how differences in provincial financial development have promoted the growth of small firms in Vietnam could provide useful insights for developing an appropriate policy mix towards creating a favorable business environment for the operation of small and medium enterprises.

Appendix B. Number of firms by sector and size used in our analysis

Sector code	Sector name	No. of firms having less than 20 employees	No. of firms having more than 50 employees	No. of firms having more than 100 employees
A	Agriculture, forestry & fishing	27	1,228	540
B	Mining & quarrying	58	650	352
C	Manufacturing	4,899	17,060	11,272
D	Electricity, gas, steam & air conditioning supply	142	114	70
E	Water supply, sewerage & waste management	41	338	274
F	Construction	3,361	7,898	4,308
G	Wholesale, retail trade & repair vehicles	19,950	3,774	1,522
H	Transportation & storage	571	2,024	1,046
I	Accommodation & food service activities	3	956	472
J	Information & communication	2	302	136
K	Financial & insurance activities	583	284	192
L	Real estate activities	3,382	340	146
M	Professional, scientific & technical activities	813	854	330
N	Administrative & support service activities	267	730	430
P	Education	94	126	70
Q	Human health & social work activities	89	164	88
R	Arts, entertainment & recreation	255	190	98
S	Other service activities	27	36	20
	Total	34,537	37,068	21,366

Appendix C. Financial development indicators by province and year

Province code	Province name	2009			2013		
		No. finance providers	FD1	FD2	No. finance providers	FD1	FD2
1	Ha Noi	315	0.049	0.095	528	0.076	0.159
17	Hoa Binh	6	0.008	0.001	13	0.016	0.003
22	Quang Ninh	1	0.001	0.000	7	0.006	0.001
24	Bac Giang	22	0.014	0.006	24	0.015	0.006
26	Vinh Phuc	30	0.030	0.024	38	0.037	0.031
30	Hai Duong	83	0.049	0.050	87	0.050	0.053
31	Hai Phong	32	0.017	0.021	36	0.019	0.024
33	Hung Yen	78	0.069	0.084	96	0.083	0.104
34	Thai Binh	191	0.107	0.122	171	0.096	0.109
36	Nam Dinh	52	0.028	0.031	50	0.027	0.030
38	Thanh Hoa	75	0.022	0.007	192	0.055	0.017
40	Nghe An	101	0.035	0.006	117	0.039	0.007
42	Ha Tinh	16	0.013	0.003	30	0.024	0.005
44	Quang Binh	22	0.026	0.003	25	0.029	0.003
45	Quang Tri	12	0.020	0.003	14	0.023	0.003
46	Thu Thien Hue	9	0.008	0.002	14	0.012	0.003
48	Da Nang	2	0.002	0.002	9	0.009	0.007
49	Quang Nam	4	0.003	0.000	6	0.004	0.001
51	Quang Ngai	15	0.012	0.003	15	0.012	0.003
52	Binh Dinh	28	0.019	0.005	46	0.030	0.008
56	Khanh Hoa	6	0.005	0.001	17	0.014	0.003
66	Dak Lak	13	0.007	0.001	21	0.012	0.002
68	Lam Dong	21	0.018	0.002	30	0.024	0.003
70	Binh Phuoc	3	0.003	0.000	7	0.008	0.001
72	Tay Ninh	21	0.020	0.005	22	0.020	0.005
74	Binh Duong	21	0.014	0.008	23	0.013	0.009
75	Dong Nai	30	0.012	0.005	38	0.014	0.006
77	Ba Ria Vung Tau	30	0.030	0.015	21	0.020	0.011
79	Ho Chi Minh	469	0.065	0.224	760	0.097	0.363
80	Long An	21	0.015	0.005	28	0.019	0.006
82	Tien Giang	23	0.014	0.009	27	0.016	0.011
83	Ben Tre	40	0.032	0.017	55	0.044	0.023
86	Vinh Long	6	0.006	0.004	7	0.007	0.005
87	Dong Thap	18	0.011	0.005	27	0.016	0.008
89	An Giang	27	0.013	0.008	33	0.015	0.009
91	Kien Giang	23	0.014	0.004	29	0.017	0.005
92	Can Tho	11	0.009	0.008	28	0.023	0.020
94	Soc Trang	17	0.013	0.005	21	0.016	0.006
96	Ca Mau	7	0.006	0.001	12	0.010	0.002

Appendix D1. Effect of local financial development on sales growth of small firms in Vietnam

	GO50			GO100		
	(1)	(2)	(3)	(4)	(5)	(6)
GO*FD2	0.322***	0.220**	0.220**	0.255***	0.160**	0.160**
	(0.085)	(0.090)	(0.092)	(0.070)	(0.075)	(0.077)
Sales	−0.474***	−0.487***	−0.487***	−0.477***	−0.490***	−0.490***
	(0.156)	(0.155)	(0.155)	(0.156)	(0.155)	(0.155)
Sales*FD2	0.040	0.040	0.040	0.039	0.039	0.039
	(0.032)	(0.032)	(0.032)	(0.032)	(0.031)	(0.031)
Private*FD2		−0.030**	−0.031**		−0.032**	−0.033**
		(0.012)	(0.012)		(0.013)	(0.013)
Private*GO		−0.341**	−0.347**		−0.339***	−0.346***
		(0.133)	(0.130)		(0.117)	(0.114)
Labour*GO		0.986***	0.989***		0.958***	0.961***
		(0.154)	(0.151)		(0.165)	(0.161)
Share of sector value added/province value added			0.003			0.006
			(0.012)			(0.012)
Share of sector labour/province population			−0.468**			−0.485**
			(0.222)			(0.197)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.484	0.162	0.178	0.438	0.154	0.169
	(0.343)	(0.344)	(0.343)	(0.343)	(0.343)	(0.341)
Model statistics:						
No. of observations	34,537	34,537	34,537	34,537	34,537	34,537
R^2	0.313	0.316	0.316	0.312	0.316	0.316
Adjusted R^2	0.311	0.314	0.314	0.311	0.314	0.314
Differential in growth rates	0.212	0.145	0.145	0.222	0.139	0.139

Variables *Sales*, *Labour* and *Province level income per capita* are in natural logarithms. FD2 is the number of financial suppliers per kilometre square at the province level and measured in natural logarithms. GO denotes GO50 for specifications (1)-(4) and GO100 for specifications (5)-(8). The differential in growth rates shows the difference in growth rates between firms in sector P (Education), at the 75th percentile of the growth opportunities GO50 (GO100) distribution, and firms in sector G (whole sales, retail trade and repair vehicles) or sector I (accommodation and food service activities), at the 25th percentile of the growth opportunities GO50 (GO100) distribution, if these firms are located in Nam Dinh province instead of Thua Thien Hue, which are at the 75th and 25th percentiles of financial development distribution, respectively. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

Appendix D2. Effect of local financial development on investment growth of small firms in Vietnam

	GO50			GO100		
	(1)	(2)	(3)	(4)	(5)	(6)
GO*FD2	0.397***	0.301***	0.309***	0.326***	0.236***	0.243***
	(0.081)	(0.088)	(0.093)	(0.069)	(0.075)	(0.079)
Investment	−0.445***	−0.458***	−0.457***	−0.448***	−0.462***	−0.461***
	(0.132)	(0.132)	(0.132)	(0.132)	(0.133)	(0.132)
Investment*FD2	0.047*	0.047*	0.047*	0.046	0.045	0.045
	(0.028)	(0.027)	(0.028)	(0.027)	(0.027)	(0.027)
Private*FD2		−0.024**	−0.024**		−0.026***	−0.026***
		(0.009)	(0.009)		(0.010)	(0.009)
Private*GO		−0.256	−0.264		−0.278*	−0.287*
		(0.175)	(0.170)		(0.156)	(0.151)
Labour*GO		1.047***	1.051***		1.009***	1.013***
		(0.211)	(0.205)		(0.211)	(0.205)
Share of sector value added/province value added			−0.008			−0.006
			(0.009)			(0.010)
Share of sector labour/province population			−0.860***			−0.880***
			(0.231)			(0.204)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.056	−0.264	−0.222	0.001	−0.277	−0.237
	(0.414)	(0.428)	(0.428)	(0.414)	(0.424)	(0.424)
Model statistics						
No. observations	34,537	34,537	34,537	34,537	34,537	34,537
R^2	0.260	0.262	0.262	0.259	0.262	0.262
Adjusted R^2	0.258	0.261	0.261	0.258	0.261	0.261
Differential in growth rates	0.261	0.198	0.203	0.284	0.205	0.211

Variables *Investment*, *Labour* and *Province level income per capita* are in natural logarithms. FD2 is the number of financial suppliers per kilometre square at the province level and measured in natural logarithms. GO denotes GO50 for specifications (1)-(4) and GO100 for specifications (5)-(8). The differential in growth rates shows the difference in growth rates between firms in sector P (Education), at the 75th percentile of the growth opportunities GO50 (GO100) distribution, and firms in sector G (whole sales, retail trade and repair vehicles) or sector I (Accommodation and food service activities), at the 25th percentile of the growth opportunities GO50 (GO100) distribution, if these firms are located in Nam Dinh province instead of Thua Thien Hue, which are at the 75th and 25th percentiles of financial development distribution, respectively. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

Appendix D3. Effect of local financial development on growth of sales per worker of small firms in Vietnam

	GO50			GO100		
	(1)	(2)	(3)	(4)	(5)	(6)
GO*FD2	0.238***	0.161**	0.164**	0.173***	0.106*	0.109*
	(0.061)	(0.066)	(0.068)	(0.050)	(0.053)	(0.055)
Salepw	−0.649***	−0.647***	−0.647***	−0.652***	−0.650***	−0.650***
	(0.144)	(0.142)	(0.142)	(0.144)	(0.143)	(0.142)
Salepw*FD2	0.009	0.012	0.012	0.008	0.010	0.011
	(0.028)	(0.028)	(0.028)	(0.028)	(0.027)	(0.027)
Private*FD2		−0.046***	−0.046***		−0.046***	−0.046***
		(0.012)	(0.011)		(0.011)	(0.011)
Private*GO		−0.257*	−0.262**		−0.216**	−0.222**
		(0.127)	(0.122)		(0.099)	(0.094)
Labour*GO		0.799***	0.801***		0.760***	0.762***
		(0.034)	(0.032)		(0.036)	(0.034)
Share of sector value added/province value added			−0.003			−0.000
			(0.011)			(0.011)
Share of sector labour/province population			−0.506*			−0.508*
			(0.254)			(0.251)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	7.986***	7.736***	7.762***	7.946***	7.734***	7.757***
	(1.122)	(1.100)	(1.107)	(1.127)	(1.105)	(1.112)
Model statistics						
No. observations	34,537	34,537	34,537	34,537	34,537	34,537
R^2	0.409	0.412	0.412	0.409	0.412	0.412
Adjusted R^2	0.408	0.411	0.411	0.408	0.411	0.411
Differential in growth rates	0.157	0.106	0.108	0.151	0.092	0.095

Variables *Investment, Labour and Province level income per capita* are in natural logarithms. FD2 is the number of financial suppliers per kilometre square at the province level and measured in natural logarithms. GO denotes GO50 for specifications (1)-(4) and GO100 for specifications (5)-(8). The differential in growth rates shows the difference in growth rates between firms in sector P (Education), at the 75th percentile of the growth opportunities GO50 (GO100) distribution, and firms in sector G (whole sales, retail trade and repair vehicles) or sector I (Accommodation and food service activities), at the 25th percentile of the growth opportunities GO50 (GO100) distribution, if these firms are located in Nam Dinh province instead of Thua Thien Hue, which are at the 75th and 25th percentiles of financial development distribution, respectively. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

Appendix D4. Effect of local financial development on growth of wages per sales of small firms in Vietnam

	GO50			GO100		
	(1)	(2)	(3)	(4)	(5)	(6)
GO*FD2	−0.181***	−0.111**	−0.121*	−0.109**	−0.049	−0.058
	(0.050)	(0.055)	(0.061)	(0.045)	(0.047)	(0.051)
Wageps	−0.662***	−0.659***	−0.657***	−0.664***	−0.661***	−0.659***
	(0.140)	(0.139)	(0.138)	(0.141)	(0.139)	(0.139)
Wageps*FD2	0.007	0.010	0.011	0.006	0.009	0.010
	(0.027)	(0.027)	(0.027)	(0.027)	(0.026)	(0.026)
Private*FD2		0.053***	0.054***		0.054***	0.054***
		(0.013)	(0.013)		(0.013)	(0.013)
Private*GO		0.210	0.231*		0.181*	0.201**
		(0.134)	(0.126)		(0.103)	(0.095)
Labour*GO		−0.748***	−0.757***		−0.709***	−0.717***
		(0.045)	(0.034)		(0.043)	(0.034)
Share of sector value added/province value added			0.006			0.003
			(0.011)			(0.012)
Share of sector labour/province population			1.748***			1.743***
			(0.405)			(0.371)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−6.329***	−6.072***	−6.146***	−6.293***	−6.071***	−6.142***
	(0.789)	(0.777)	(0.778)	(0.789)	(0.779)	(0.780)
Model statistics						
No. observations	34,537	34,537	34,537	34,537	34,537	34,537
R^2	0.416	0.419	0.419	0.416	0.418	0.419
Adjusted R^2	0.415	0.418	0.418	0.415	0.417	0.418
Differential in growth rates	−0.119	−0.073	−0.080	−0.095	−0.043	−0.050

Variables *Investment*, *Labour* and *Province level income per capita* are in natural logarithms. FD2 is the number of financial suppliers per kilometre square at the province level and measured in natural logarithms. GO denotes GO50 for specifications (1)-(4) and GO100 for specifications (5)-(8). The differential in growth rates shows the difference in growth rates between firms in sector P (Education), at the 75th percentile of the growth opportunities GO50 (GO100) distribution, and firms in sector G (whole sales, retail trade and repair vehicles) or sector I (Accommodation and food service activities), at the 25th percentile of the growth opportunities GO50 (GO100) distribution, if these firms are located in Nam Dinh province instead of Thua Thien Hue, which are at the 75th and 25th percentiles of financial development distribution, respectively. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

Appendix E1. Effect of local financial development on sales growth of small firms in Vietnam

	GO50				GO100			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FD1	0.057***	0.014		−0.100*	0.057***	0.013		−0.048
	(0.011)	(0.014)		(0.058)	(0.011)	(0.014)		(0.080)
GO	2.548***	4.136***		1.245***	2.253***	3.545***		1.094**
	(0.788)	(0.854)		(0.449)	(0.696)	(0.743)		(0.435)
Sales	−0.567***	−0.567***	−0.389	−0.546***	−0.567***	−0.567***	−0.397	−0.542***
	(0.115)	(0.115)	(0.273)	(0.112)	(0.115)	(0.115)	(0.272)	(0.112)
FD1*GO		0.503***	0.364**	0.532***		0.416***	0.254*	0.393***
		(0.115)	(0.169)	(0.119)		(0.109)	(0.139)	(0.117)
Sales*FD			0.062				0.060	
			(0.061)				(0.060)	
Private*FD			−0.025**				−0.027***	
			(0.009)				(0.010)	
Private*GO			−0.380***				−0.374***	
			(0.106)				(0.092)	
Labour*GO			1.013***				0.982***	
			(0.155)				(0.165)	
Share of sector value added/province value added			0.001	−0.015			0.005	−0.000
			(0.012)	(0.011)			(0.013)	(0.013)
Share of sector labour/province population			−0.393*	1.375*			−0.418**	1.096
			(0.215)	(0.712)			(0.193)	(0.752)
Private				0.064*				0.043
				(0.034)				(0.038)
Labour				0.243***				0.227***
				(0.059)				(0.055)
Constant	0.329	0.202	0.291	−0.525**	0.402	0.264	0.255	−0.074
	(0.285)	(0.285)	(0.374)	(0.222)	(0.302)	(0.300)	(0.364)	(0.357)
Model statistics								
Observations	34,537	34,537	34,537	34,537	34,537	34,537	34,537	34,537
R-squared	0.309	0.310	0.314	0.284	0.309	0.310	0.314	0.284
Adjusted R-squared	0.308	0.309	0.313	0.284	0.308	0.308	0.313	0.284

Variables *Sales* and *Labour* are in natural logarithms. *FD1* is the number of financial suppliers per 1,000 persons at the province level and in natural logarithms. GO denotes GO50 for specifications (1)-(4) and *GO100* for specifications (5)-(8). Specifications (1)-(3) and (5)–(7) includes sector and province dummies. Specifications (4) and (8) exclude the sector and province dummies. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

Appendix E2. Effect of local financial development on Investment growth of small firms in Vietnam

	GO50				GO100			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FD1	−0.060***	−0.113***		−0.201***	−0.060***	−0.116***		−0.190***
	(0.018)	(0.021)		(0.062)	(0.018)	(0.022)		(0.063)
GO	1.681*	3.586***		2.292***	1.486*	3.099***		2.168***
	(0.898)	(0.994)		(0.478)	(0.794)	(0.879)		(0.483)
Investment	−0.551***	−0.552***	−0.326	−0.535***	−0.551***	−0.552***	−0.335	−0.535***
	(0.103)	(0.103)	(0.237)	(0.095)	(0.103)	(0.103)	(0.236)	(0.094)
FD1*GO		0.610***	0.520**	0.735***		0.525***	0.400**	0.617***
		(0.152)	(0.196)	(0.145)		(0.148)	(0.171)	(0.150)
Investment *FD			0.078				0.076	
			(0.053)				(0.053)	
Private*FD			−0.019***				−0.021***	
			(0.006)				(0.006)	
Private*GO			−0.305*				−0.324*	
			(0.180)				(0.161)	
Labour*GO			1.077***				1.035***	
			(0.209)				(0.209)	
Share of sector value added/province value added			−0.011	−0.043***			−0.007	−0.038***
			(0.012)	(0.011)			(0.013)	(0.013)
Share of sector labour/province population			−0.748***	0.182			−0.776***	−0.336
			(0.200)	(0.631)			(0.178)	(0.600)
Average wage in province by sector				0.041				0.042
				(0.033)				(0.032)
Provincial per capita income				0.281***				0.279***
				(0.047)				(0.046)
Population density	−0.355	−0.508	−0.079	−0.989***	−0.306	−0.481	−0.126	−0.957***
	(0.376)	(0.379)	(0.469)	(0.242)	(0.394)	(0.394)	(0.456)	(0.243)
Private	36268	36268	36268	36268	36268	36268	36268	36268
	0.256	0.256	0.261	0.243	0.256	0.256	0.261	0.243
Labour	0.255	0.255	0.260	0.243	0.255	0.255	0.260	0.243
				(0.047)				(0.046)
Constant	−0.508	0.689	0.520	−0.597	−0.481	0.699	0.603	−0.629*
	(0.379)	(0.595)	(0.491)	(0.371)	(0.394)	(0.600)	(0.525)	(0.368)
Model statistics								
Observations	34,537	34,537	34,537	34,537	34,537	34,537	34,537	34,537
R-squared	0.256	0.261	0.261	0.243	0.256	0.261	0.261	0.243
Adjusted R-squared	0.255	0.260	0.260	0.243	0.255	0.260	0.260	0.243

Variables *Investment* and *Labour* are in natural logarithms. *FD1* is the number of financial suppliers per 1,000 persons at the province level and in natural logarithms. *GO* denotes *GO50* for specifications (1)-(4) and *GO100* for specifications (5)-(8). Specifications (1)-(3) and (5)–(7) includes sector and province dummies. Specifications (4) and (8) exclude the sector and province dummies. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

Appendix E3. Effect of local financial development on Sales per worker growth of small firms in Vietnam

	GO50				GO100			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FD1	−0.198***	−0.235***		−0.019	−0.198***	−0.232***		−0.005
	(0.042)	(0.045)		(0.089)	(0.042)	(0.044)		(0.089)
GO	1.816**	3.169***		0.719**	1.606**	2.581***		0.602**
	(0.721)	(0.791)		(0.302)	(0.637)	(0.687)		(0.294)
Salepw	−0.670***	−0.671***	−0.651***	−0.596***	−0.670***	−0.671***	−0.658***	−0.593***
	(0.096)	(0.096)	(0.240)	(0.097)	(0.096)	(0.096)	(0.239)	(0.096)
FD1*GO		0.429***	0.287**	0.456***		0.314***	0.184*	0.299***
		(0.096)	(0.126)	(0.102)		(0.084)	(0.100)	(0.095)
Salepw*FD			0.008				0.005	
			(0.052)				(0.052)	
Private*FD			−0.037***				−0.037***	
			(0.010)				(0.010)	
Private*GO			−0.282*				−0.232**	
			(0.142)				(0.108)	
Labour*GO			0.809***				0.768***	
			(0.033)				(0.034)	
Share of sector value added/province value added			−0.006	−0.009			−0.003	−0.001
			(0.011)	(0.015)			(0.011)	(0.016)
Share of sector labour/province population			−0.448*	1.723*			−0.458*	1.030
			(0.236)	(0.877)			(0.237)	(0.849)
Average wage in province by sector				0.066				0.066
				(0.060)				(0.058)
Provincial per capita income				0.137**				0.133**
				(0.052)				(0.052)
Population density	7.103***	6.999***	7.832***	6.496***				−0.002
	(0.947)	(0.934)	(1.131)	(1.184)				(0.010)
Private	34537	34537	34537	34537				0.252
	0.408	0.409	0.411	0.361				(0.179)
Labour	0.407	0.408	0.410	0.360				−0.156
				(0.052)				(0.113)
Constant	6.999***	9.061***	8.905***	6.496***	7.156***	7.054***	7.803***	6.457***
	(0.934)	(2.835)	(2.965)	(1.184)	(0.957)	(0.948)	(1.136)	(1.183)
Model statistics								
Observations	34,537	34,537	34,537	34,537	34,537	34,537	34,537	34,537
R-squared	0.409	0.411	0.411	0.361	0.408	0.409	0.411	0.358
Adjusted R-squared	0.408	0.410	0.410	0.360	0.407	0.408	0.410	0.358

Variables *Salepw* and *Labour* are in natural logarithms. *FD1* is the number of financial suppliers per 1,000 persons at the province level and in natural logarithms. *GO* denotes *GO50* for specifications (1)-(4) and *GO100* for specifications (5)-(8). Specifications (1)-(3) and (5)-(7) includes sector and province dummies. Specifications (4) and (8) exclude the sector and province dummies. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

Appendix E4. Effect of local financial development on wage-to-sales ratio growth of small firms in Vietnam

	GO50				GO100			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FD1	0.412***	0.442***		0.208**	0.412***	0.435***		0.184**
	(0.069)	(0.074)		(0.078)	(0.069)	(0.073)		(0.076)
GO	−2.233**	−3.340***		−1.104***	−1.974**	−2.648***		−0.915***
	(0.840)	(0.907)		(0.330)	(0.743)	(0.793)		(0.312)
Wagets	−0.678***	−0.678***	−0.662***	−0.593***	−0.678***	−0.678***	−0.667***	−0.592***
	(0.093)	(0.093)	(0.234)	(0.089)	(0.093)	(0.093)	(0.234)	(0.089)
FD1*GO		−0.351***	−0.229*	−0.443***		−0.217**	−0.109	−0.265**
		(0.099)	(0.114)	(0.112)		(0.086)	(0.095)	(0.102)
Wagets*FD			0.007				0.005	
			(0.051)				(0.051)	
Private*FD			0.042***				0.042***	
			(0.013)				(0.012)	
Private*GO			0.237				0.198*	
			(0.149)				(0.112)	
Labour*GO			−0.760***				−0.720***	
			(0.033)				(0.033)	
Share of sector value added/province value added			0.010	0.029			0.005	0.020
			(0.012)	(0.019)			(0.012)	(0.018)
Share of sector labour/province population			1.685***	0.357			1.691***	1.064
			(0.397)	(1.040)			(0.367)	(1.025)
Private				−0.105				−0.105
				(0.087)				(0.085)
Labour				−0.097				−0.094
				(0.069)				(0.069)
Constant	−4.763***	−4.677***	−6.208***	−4.470***	−4.828***	−4.757***	−6.176***	−4.530***
	(0.538)	(0.524)	(0.795)	(0.791)	(0.556)	(0.544)	(0.794)	(0.795)
Model statistics								
Observations	34,537	34,537	34,537	34,537	34,537	34,537	34,537	34,537
R-squared	0.415	0.416	0.419	0.361	0.415	0.416	0.419	0.360
Adjusted R-squared	0.414	0.415	0.418	0.361	0.414	0.415	0.417	0.360

Variables *Wagets and Labour* are in natural logarithms. *FD1* is the number of financial suppliers per 1,000 persons at the province level and in natural logarithms. *GO* denotes *GO50* for specifications (1)-(4) and *GO100* for specifications (5)-(8). Specifications (1)-(3) and (5)-(7) includes sector and province dummies. Specifications (4) and (8) exclude the sector and province dummies. The sample for estimation includes small firms with less than 20 employees. Robust standard errors clustered at the province level are in parentheses. Significance at the 1%, 5% and 10% is indicated by ***, **, and *, respectively.

Appendix F. VIF results

Variable	Sale/ GO50	Sale/ GO100	Investment/ GO50	Investment/ GO100	Salepw/ GO50	Salepw/ GO100	Wagets/ GO50	Wagets/ GO100
Sector labour/province population	1.19	1.19	1.19	1.18	1.19	1.19	1.19	1.19
FD*GO	1.13	1.12	1.13	1.12	1.13	1.13	1.12	1.12
Labour	1.12	1.12	1.11	1.11	1.05	1.05	1.05	1.05
Lagged-depvar	1.09	1.09	1.09	1.08	1.03	1.03	1.03	1.03
Private	1.05	1.05	1.05	1.05	1.01	1.01	1.01	1.01
VA sector/province	1	1	1	1	1	1	1	1
Mean VIF	1.10	1.09	1.09	1.09	1.07	1.07	1.07	1.07

VIFs are calculated based on the specifications (4) and (8) for each dependent variables in Appendices D1, D2, D3, D4, respectively; Lagged-depvar is the lagged value of dependent variables.