



UNIVERSITÄT PADERBORN
Die Universität der Informationsgesellschaft

CENTER FOR INTERNATIONAL ECONOMICS

Working Paper Series

Working Paper No. 2014-10

Institutional environment, human capital, and firm growth: Evidence from Vietnam

Thomas Gries, Ha Van Dung

June 2014



CENTER FOR
INTERNATIONAL
ECONOMICS

INSTITUTIONAL ENVIRONMENT, HUMAN CAPITAL, AND FIRM GROWTH: EVIDENCE FROM VIETNAM

Thomas Gires, Ha van Dung

Abstract

In this paper, we investigate the impacts of the institutional environment and the entrepreneur's education on firm growth in Vietnam. Using a firm-level dataset, we obtain a balanced panel data from 2006 to 2009 for 37,788 registered enterprises from a unique data set. We analyze the effects of the institutional factors on the growth of firms using the system GMM analysis. We find that in accordance to recent theoretical literature, higher level of institutional factors such as business support service, land access, time costs, and informal charges will promote firm growth in both employment and capital. Furthermore the impacts of institutional factors are more significant in capital growth of firms. In addition to the insight, we look at the impacts of entrepreneur's education on firm growth. We use the fixed effects estimation method and obtain the results supporting the hypothesis that higher level of entrepreneur's education will associate with a higher growth of firms.

Key words: firm growth, institutional factors, human capital, entrepreneurship, capital structure.

JEL classification: O12, O16

1. Introduction

Countries try to develop through expansion of a market economy. Entrepreneurship is a core element of developing a market economy. As a result, many studies have focused on the entrepreneurship in developed and transitional countries.¹ However, in developing countries which start to turn into a modern market economy, we do not know much about entrepreneurship and we are not clear about what fosters firms and firm growth under the conditions these infant market economies provide. Existing theories on firm growth do not sufficiently consider the institutional environment of less developed markets in developing economies (Sleuwaegen and Goedhuys, 2002). Furthermore, the literature has not fully investigated the contribution of entrepreneurial activities, which is one of the important factors to consider in underdeveloped and low income economies (Gries and Naude, 2011). If we know more about the institutional environment and if we can identify which entrepreneurial characteristics are needed, the answers can be useful for policy designers in fostering firm growth. The purpose of this paper is to examine the role factors describing the institutional environment (or institutional factors) of the entrepreneurship and entrepreneur's education play for firm growth in a low income, infant market economy like Vietnam. The empirical study has found that the institutional environment significantly affects firm performance. A more surprising finding is that the institutional factors are more significantly affecting the growth of a firm's capital than that of a firm's employment. Furthermore, firm growth is affected by skills and abilities of entrepreneurs.

The firm dynamics originate from Gibrat's law of proportion effect (LPE), which is the base for stochastic models and which states that the firm growth function is a randomly distributed model. According to this law, firm growth is independent of its size. Size

¹ Burke *et al.*, 2000; Honjo and Harada, 2006; Dunne *et al.*, 1989; Dunne and Hughes, 1994; Liu *et al.*, 1999; Praag, 2006; Park *et al.*, 2010; Reichstein and Dahl, 2004; Tomczyk *et al.*, 2013; Yusada, 2005

distribution of firms will increase with time and firms share the same growth opportunities across size (Bigsten and Gebreeyesus, 2006). However, in accordance to recent studies in developed and transitional economies, many empirical researches in developing economies showed that the Gibrat's Law does not hold. In an empirical study, McPherson (1996) finds that there exists a negative relationship between firm growth and both firm size and firm age when he investigates micro and small firms in southern Africa. Using the linear estimation method, he considers determinants of firm growth in size and age, sector, location, human capital, and socio-economic variables. Sector differentiates firm growth as firms in construction and the service sector have probably higher growth. Firms in urban and commercial areas grow more rapidly than those in rural and house-base areas. Gender discrimination is found to persist as firms with male entrepreneurs experience higher growth rates. Mead and Liedholm (1998) descriptively support the inclusion that there is a negative impact of firm age, firm size and female entrepreneurs on firm growth. They conduct a survey to examine the determinants of growth of micro and small firms in Dominica and five African countries (Botswana, Kenya, Malawi, Swaziland, and Zimbabwe). They find that enterprises in these countries grow faster if they are smaller, younger, and male-headed firms. The sectorial variable differently affects firm growth across countries. However, the study of Biesebroeck (2005) finds superior performance of large firms. To investigate the impacts of firm size on firm growth and productivity of manufacturing enterprises in nine sub-Saharan African countries, the study uses a panel data set from 1992 to 1996 including approximately 200 firms per country. The results reveal that the largest manufacturing firms display the highest growth rate in sub-Saharan African countries. Firms with 100 employees and above are more productive and more likely to survive. Large firms are found to grow faster and to increase productivity faster. The aggregate

productivity growth is largely dependent on the performance of large firms. The contribution of micro and small firms to aggregate productivity growth is not remarkable.

Apart from enterprise characteristics, institutional factors such as the quality and quantity of infrastructure, the nature and the enforcement of business regulations, property rights, and the openness of public resources are considered as important determinants of firm growth (Aterido *et al.*, 2011). Sleuwaegen and Goedhuys (2002) use data of manufacturing firms in Côte d'Ivoire to investigate the influence of institutional elements on firm growth. A sample of 185 manufacturing firms from 1995 was selected. Quantitative results indicate that the legitimization of firms has positive impacts on firm growth and that there exists a negative relationship between firm growth and both, firm size and firm age. Results show that firm growth obstacles, including regulatory barriers, market constraints, infrastructure, and financial constraints differ systematically with firm size. Large and micro firms report less frequent constraints compared to small and medium firms. Fisman and Svensson (2007) employ firm data in Uganda to study the impacts of bribery payments and taxes on firm growth. These two business environment factors are found to have negative impacts on firm growth, whereby the negative influence of corruption is more severe to firm performance than that of taxation. Corruption is also considered an obstacle to firm growth in the work of Honorati and Mengistae (2007). The growth of small-scale manufacturing firms in India is examined and a relatively small sample size has been employed. Four institutional factors including corruption, labor regulation, access to finance, and the quality of power supplies are obstacles to business operation and growth. Hallward-Driemeier *et al.* (2006) emphasize the importance of the investment climate on firm performance in China with a large sample size of 1,500 firms.

Technological infrastructure, government regulatory burdens, and corruption matter largely, while labor market flexibility and access to finance are found to have less impact on firm growth. In another study using a large number of firms, Dollar *et al.* (2005) investigate the investment climate and its impacts on firm growth in 4 developing countries, including China, Bangladesh, India, and Pakistan. There is a significant variation of investment climates within each country and the role of local government is important. Power outages and customs delays are the most severe obstacles for firm productivity and profitability. The availability of financial services strongly relates to firm growth. However, they do not find any impacts of general issues of governance and corruption across countries and locations. The influence of corruption is considered in detail in the research of Wang and You (2012), which indicates that corruption likely fosters firm growth in China. This study also shows that the disparity of financial development across regions affects firm growth. Because of the imperfect Chinese financial market, higher probability to access external finance is supposed to enhance firm growth.

The literature on firm growth in Vietnam is relatively rare. This may result from the unavailability of firm-level data, which requires many resources. Hansen *et al.* (2009) use data from three overlapping surveys during the period of 1990 and 2000 to investigate the impacts of government assistance and other interactions with the state sector on long-term performance of small and medium size manufacturing enterprises in Vietnam. Starting with a total of 447 firms in 1990, the data set is reduced to 300 incumbent firms in 2000 due to the combination of three different datasets. The determinants of SME growth have been indicated. Firm size relates negatively to firm growth while urban firms grow faster than their rural counterparts. Sole proprietorship, cooperatives, and limited liability firms also grow faster than household firms. The

initial government assistance seems to have positive impacts on firm growth. Firms that have the state sector as a customer grow faster than those without customers from the state sector. Another study with 337 manufacturing SMEs in 2005 has been done by Tuan and Yoshi (2009) employing the normal OLS for multiple estimators. The results reveal that SMEs introducing new products grow faster than those without new products. Firm size, firm age, and competition intensity negatively relate to firm growth while higher private shares will promote the growth of firms. Nguyen and Dijk (2012) use data of 874 enterprises from a survey in 2005 to analyze the relationship between corruption and growth of private and state-owned enterprises in Vietnam. They use three different perceived measures for corruption and find that corruption is harmful to growth of private firms but not for state-owned firms. They also induce that the quality of provincial public governance such as land access, private sector development policy, and the costs of new business entries can generate significant differences in the level of corruption across provinces in Vietnam.

The literature on the role the institutional environment plays for firm growth and performance in developing economies is rather limited. Most previous studies use either firm-level subjective or objective measures for the institutional environment and no study is able to look at a comprehensive number of institutional conditions. Firm-level subjective measures represent a firm's attitude towards the business environment and the data relies on questions such as: "Do business associations play an important role in advising and countering policy?" And the answer may be a Likert scale ranked from 1 to 5 or higher. The objective measures relate to countable values of the business environment such as "How many times did your firm receive tax inspections last year?". We would like to fill this literature gap by employing absolutely new indicators as proxies for the institutional environment. These indicators compromise both objective

and subjective measures and are considered comprehensive indicators for the institutional environment. These indicators are professionally established to measure different dimensions of the business environment and are regarded as critical tools for measuring and assessing the standards of economic governance in Vietnam (VCCI, 2013). This is one objective of this paper and we therefore concentrate on the role the institutional environment plays for firm growth in Vietnam as a representative for developing economies. Deriving the idea from the theoretical work of Gries and Naude (2011), it is suggested that successful entrepreneurial activities are more likely if the market environment allows a match between entrepreneurial ideas and opportunities in the market to establish a successful business, we form *hypothesis.1* with additional modifications:

Hypothesis 1: Higher levels of institutional factors will be positively related to firm growth.

This hypothesis implies that firms located in provinces which have experienced higher points on the institutional quality scale will associate with higher growth rates. In other words, the business environment created by the local authority is considered a determinant of firm performance and the quality of local economic governance will affect firm growth in the same direction.

The literature on firm dynamics in developing economies seems to neglect the role of entrepreneurial human capital. Relatively few studies have focused on this issue and the results are mixed. The study of McPherson (1996) includes entrepreneurial human capital to the model and finds that human capital positively relates to firm growth. Enterprises with trained entrepreneurs grow faster than those with untrained entrepreneurs. However, entrepreneurial human capital seems to have no impacts on growth according to other studies. Hansen *et al.* (2009) measure the impacts of

entrepreneurial human capital by adding the level of education of the entrepreneur into the model specifications, but they don't find any significant evidence for the effect of this variable on firm performance. The study of Tuan and Yoshi (2009) leads to the same conclusion when they use two indicators for human capital of entrepreneurs including education and working experience in the specifications. Both indicators for human capital are found to have no impact on firm growth. In order to fill the gap in the literature, we would like to examine the role of entrepreneurial human capital on firm growth in Vietnam and following the theoretical work of Gries and Naude (2011) on the impacts of human development on entrepreneurial functioning,² we form *hypothesis 2*:

Hypothesis 2: Human capital development of entrepreneurs will associate with a higher degree of firm performance or a higher level of education of entrepreneurs will result in higher growth rates of firms.

Hypothesis 2 states that firms with entrepreneurs with higher levels of education are likely to experience higher growth rates.

In order to justify these two hypotheses, we use firm-level data in combination with provincial data. One important contribution of this study is that it employs a rich data set from a yearly census, which has not been explored before reaching a total of over 233,000 enterprises in 2009. A high number of observations can give a general and comprehensive picture about the growth process of firms in the context of different local business environments in Vietnam. In addition, the combination of time-series data and cross-section data allows us to apply a more in-depth methodology by implementing more reliable estimation methods for panel data. We employ the dynamic model and control for the endogeneity of firm variables. To investigate the role of the

² Which implies that the human capital development will associate with a higher degree of entrepreneurial functioning

entrepreneur's education and how it influences firm growth, we use the fixed effect estimation method.

The empirical results in Vietnam show that higher level of the institutional factors such as business support service, land access, time costs, and informal charges will associate with higher growth rates of firms. The impacts of these institutional indicators can be observed in both dimensions of firm growth: employment and capital. An interesting finding is that the institutional factors have more significant impacts on the growth rate of a firm's capital than on the growth rate of a firm's employment.

That there is an impact of education on firm growth is confirmed. Firms that have entrepreneurs with a bachelor degree experience higher labor growth rates if these firms operate in the agriculture or service sector. We found no significant evidence for this same relationship when it comes to industrial firms. The influence of the entrepreneur's education on capital growth is not so clear. The results indicate that higher levels of education of entrepreneurs foster the capital growth of firms if these firms operate in the service sector while there is no significant evidence for an education effect in the agriculture and industry sectors.

The paper is structured as follows. Section II will present the empirical analysis which describes both descriptive and econometric methods used in this paper. Section III analyzes the empirical results in which the roles the institutional environment and the entrepreneur's education play for firm growth are highlighted. Section IV gives conclusions for the paper.

2. Data and Methodology

2.1. Data sources

The data used in this study has been retrieved from four main sources. *Firstly*, the firm data is extracted from the annual enterprise censuses conducted by the General Statistics

Office of Vietnam (GSO). The annual census which started in 2000 has surveyed 100% of incumbent state-owned, private and foreign enterprises firms (except those controlled by the Ministry of Defense and the Ministry of Police) in Vietnam. All enterprises in the survey are formally registered. The number of enterprises increased from 42,307 in 2000 to 233,236 in 2009. The survey is led by the GSO, and the Provincial Department Statistics Offices (DSO) are responsible for the data collection process. Entrepreneurs are asked to submit a completed answer sheet of the questionnaire to the respective DSO. The database contains two main sources of information: a) the enterprise's characteristics such as the enterprise's name, address, type, sector and b) the enterprise's structure such as the number of employees, wages, sales, R&D activities, environmental protection activities. More questions have been gradually added to the questionnaire in recent censuses. Some information just appears in the two surveys of 2008 and 2009 i.e. the entrepreneur's level of education or the information about the firm's technical issues. This dataset is the most comprehensive and largest source about entrepreneurship in Vietnam. The *second* source is the GSO website which provides data about the different provinces. The province-level dataset is collected on a yearly basis and published afterwards in the Statistical Yearbook of Vietnam. The *third* source is the Vietnamese Chamber of Commerce and Industry (VCCI). The VCCI provides data on the different indicators describing the institutional environment for entrepreneurship in Vietnam. These indicators are considered highly important and are the only measure of the institutional environment that has been compiled by official institutions in Vietnam. The *last* data source made use of is the World Bank website which supplies the GDP deflator of Vietnam for the study period. By means of the GDP deflator, we calculate the real growth rate of firm capital.

2.2. The dependent variable: firm growth

As in the studies of Dollar *et al.* (2005), Hallward-Driemeier *et al.* (2006), Aterido *et al.* (2011), Aterido and Hallward-Driemeier (2007), we consider firm growth in the dimensions of employment growth and capital growth. Following Allen *et al.* (2007) and Nguyen and Dijk (2012) we define that the employment growth is the rate of difference in the number of employees between year_t and year_{t-1} relative to the number of employees in year_{t-1}. The firm-level capital growth is similarly calculated using the position of total firm assets. We consider the real growth rate of firm capital since the value of total assets in the latter year (Y_t) is adjusted by the GDP deflator to the previous year (Y_{t-1}) before we get to the subtraction in the above fraction.

2.3. The institutional environment and firm growth

2.3.1. Institutional variables

We examine the impacts of the institutional environment on the growth of firms. Our investigation is based on a set of institutional indicators including nine different indicators measuring the business and institutional environment in Vietnam. These nine indicators comprise both, firm-level subjective and objective measures for the business environment to assess the economic governance on the provincial level. The aggregate measurement PCI (Provincial Competitiveness Index) is a weighted combination of these nine indicators and the PCI is regarded as the overall measurement of provincial governance. These institutional indicators have been developed since 2005 by the Vietnamese Chamber of Commerce and Industry (VCCI) and the U.S. Agency for International Development (USAID) (PCI, 2013). They are standardized to a ten-scale point and are: (i) ENTRYCOST: time cost to register, to get licenses, and perceived degree of difficulty to get all licenses; (ii) LANDACCESS: how easy to access land and the security of tenure; (iii) TRANSPARENCY: transparency and access to information

and legal documents; (iv) TIMECOST: time waste on bureaucratic compliance and inspections; (v) INFORCHARGE: informal charges; (vi) PROACTIVITY: creativity and cleverness in implementing central policy of provincial officials; (vii) SUPPORTSERVICE: availability of business support; (viii) LABORTRAIN: efforts of provincial authorities for training and skill development; and (ix) LEGAL: private sector's confidence in provincial legal institutions.³ A high score means: (a) less costs and charges with regard to the indicators (i), (iv), and (v), and (b): good governance with regard to the other indicators.

2.3.2. *Control variables*

The control variables consist of two groups: firm specifics and provincial characteristics. Firm-specific covariates include ownership, location, age, size, and capital structure. First, firm ownership is divided into public, private, and foreign firms. Ownership is classified, according to who is the majority shareholder: i.e. public enterprises are those in which more than 50% of total shares are in hand of the public sector. Two dummy variables (PUBLIC and PRIVATE) are used for the firm ownership covariate. Second, the location of firm's headquarter is considered as the firm's location. We separate location into three main regions: the north, the center, and the south of Vietnam. Two location dummies (SOUTH and NORTH) are used.

Firm age (AGE) is included to the model to test where the Gibrat's LPE holds or not. Firm age is a numeric variable and is measured in years. We expect that AGE has negative impacts on firm growth. We also include firm size (SIZE) into the model and SIZE is measured by the firm's total assets and it is expected to have negative effects on firm growth since large firms tend to grow slower than smaller ones. The capital structure of firms (STRUCTURE), which is measured by the rate between total

³ The definitions of indicators are given in Appendix 1.

liabilities and total assets of a firm at the beginning of the financial year, is included. It is used as a proxy for internal finance and is used to test whether firm growth is financially constrained.

Provincial characteristics are also supposed to have impacts on firm growth. To capture the provincial impacts, we concentrate on four main categories: urbanization, population growth, public investment and average human capital. First, the rate of people living in urban areas within one province (URBAN) is used to measure the urbanization-rate. Enterprises in regions with a relatively high urban density may experience higher growth rates than those enterprises operating in rural areas due to a better access to input and output markets. Highly urbanized areas in Vietnam are often big cities, which can provide large quantities and highly differentiated production factors such as capital and labor. Largely urbanized areas represent a large market for a firm's products at least if their outputs are consumed domestically. Most main ports are located in large cities and being located closely minimizes the transportation costs for firms, whose products are exported. As a pure population indicator may correlate with the urbanization variable we use the growth rate of population (POPULATION) instead. Third, firms may grow due to the attractiveness of the regional economic environment and the presence of public infrastructure. In order to capture these potentially favorable conditions that might be provided, we use annual public investment per capita (INVESTMENT) as an indicator on the provincial level to account for investment in the economic environment. We do not use the total annual public investment since provinces large in population and economic size can receive more capital from the central government, and the average capital can eliminate the difference in the provincial size. The quality of the labor force is one last important factor of the provincial characteristics considered here. The average number of students as a share of

the total provincial population (STUDENT) is used as a proxy for the labor force quality.

2.3.3. Samples

In order to verify *hypothesis 1*, we compile the first dataset, which combines enterprise information from 2006 to 2009 with provincial data of the same period. The first dataset is a balanced panel containing a total of 37,788 firms in three main categories: agriculture, industry and services.

Figure 1 shows the shares of firms in each sector. Agricultural firms account for 4% of the total number of firms but their shares of total employees and capital are much higher with 44% and 41%, respectively. 41% of the firms operate in the industrial sector, employing 44% of total employees, and binding 32% of total assets. The total share of service firms is largest (50%) but the employment and capital shares are lower than those of agricultural and industrial firms. The above figures indicate that agricultural enterprises are on average larger than those firms operating in service and industrial sectors in both aspects: employment and capital.

Figure 1: Share of firms

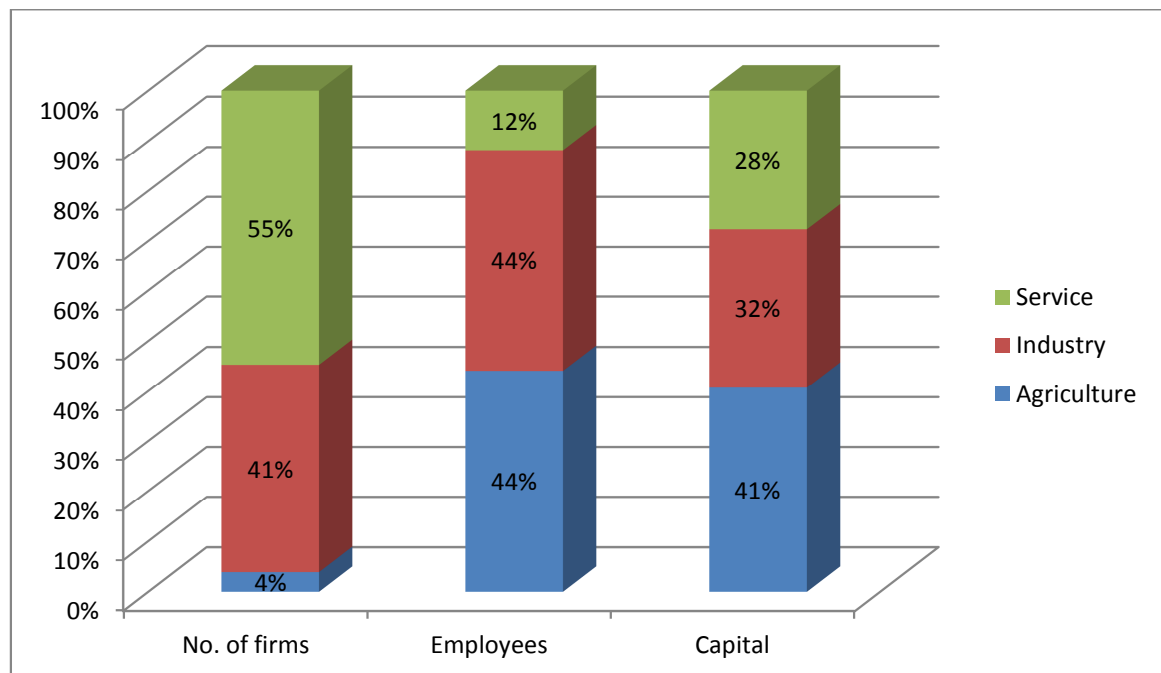


Table 1: Employment growth and capital growth

	Mean	25th percentile	Median	75th percentile
Employment growth	.100	0	0	.071
Agriculture	.061	0	0	.056
Industry	.125	-.038	0	.101
Service	.085	.000	0	.043
Capital growth	.200	-.113	.004	.256
Agriculture	.112	-.119	-.034	.117
Industry	.184	-.115	.008	.254
Service	.356	-.111	.004	.268

Table 1 reports the mean and the standard deviation of employment growth and capital growth across sectors. According to our sample, the average growth rate of total employees during the research period is 10%, which is lower than the 12% Aterido *et al.* (2011) report of. Across sectors, agricultural firms experience the lowest growth rate. Industrial firms grow twice as fast as the agricultural firms. Firm capital grows at an average rate of 32.5% yearly. Service firms experience the highest growth rates (35.6% on average) during the period while the capital of agriculture firms grows slowest, namely at a rate of 23% yearly. Both agricultural and industrial growth rates stay below average.

Graphically, the employment growth rate of firms, which is presented in Figure 2, fluctuates across time and sector. At most points of time, except in 2008, employment growth of agricultural firms is lower than those of industrial and service firms. The growth trend of agricultural firms is different from those firms operating in the industry and service sector. While in 2008, agricultural firms experienced higher growth rates in employment compared to 2007, reaching the highest level (9.6%) in 4 years, the employment growth rate in industrial and service firms decreased by about 1% and

3.3% in each sector, respectively. Growth trends of firm capital are identical in all sectors. Figure 3 shows that there was a large slowdown in capital growth during 2008 and 2009. In 2009 capital grew faster again. In 2008, the capital growth rate of industrial and service firms was at about 4% while these figures were roughly 24% in respect of industrial and 30% in respect of service firms in the years 2007 and 2009. One common feature is that firms of all sectors experienced significant lower grow rates in 2008. This may reflect the worldwide economic recession that started the year before.

Figure 2: Average employment growth of firms

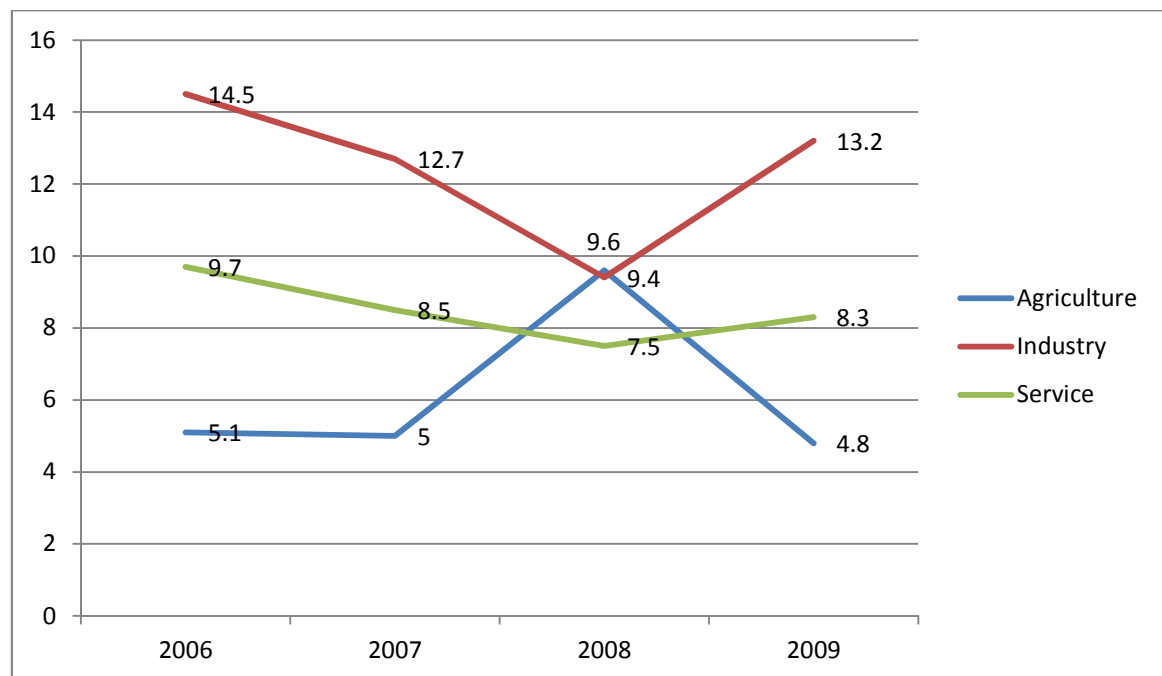


Figure 2: Average capital growth of firms

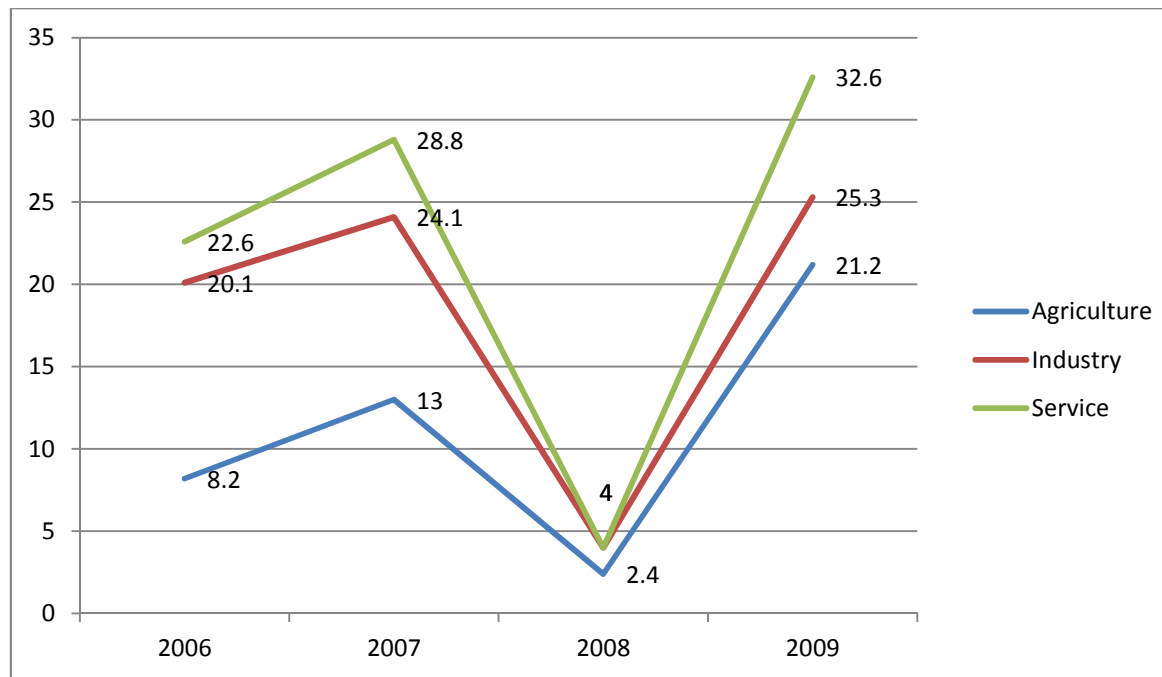


Table 2 reports descriptive statistics of variables used in the study. Most firms are privately owned while public and foreign firms represent a small number of total firms with 6% and 7%, respectively. The ratio of debt to total assets is 0.48. However, the high standard deviation shows that this rate differs more extremely among firms in Vietnam than those in Japan (Honjo and Harada, 2006). There is a high number of firms located in the south (41%). 26% of firms are located in the Center and 34% of firms are located in the North.

Table 2: Variable descriptions and statistics

Variable	Description	Mean	S.D.
Dependent variable			
Emp_growth	Employment growth	.100	.672
Cap_growth	Capital growth	.200	1.110
Entrepreneur's characteristics*			
EDU	University degree gained (yes = 1)	.720	.449
AGE_ENT	Age of the entrepreneur	47.234	9.097
MALE	Gender of the entrepreneur (male =1)	.791	.406
Firm's characteristics			
STRUCTURE	Rate of total liability to total assets at the beginning of year	.478	1.421
PUBLIC	Public sector holds more than 50% shares (yes = 1)	.063	.244
PRIVATE	Private sector holds more than 50% shares (yes = 1)	.866	.341
FOREIGN	Foreign sector holds more than 50% shares (yes = 1)	.071	.257
AGE	Age of firm	8.330	6.868
SIZE	Total firm's assets	.052	.717
NORTH	Firm's headquarter locate in the North (yes = 1)	.337	.473
CENTER	Firm's headquarter locate in the Center (yes = 1)	.257	.440
SOUTH	Firm's headquarter locate in the South (yes = 1)	.406	.491
Provincial characteristics			
URBAN	Urban rate	.377	.263
POPULATION	Population growth	1.444	4.178
STUDENT	Number of students per capita	39.277	45.520
INVESTMENT	Public investment per capita	82.708	93.016

** Statistics for two years (2008 and 2009) only*

2.3.4. Methodology

The lack of empirical evidence on the determinants of successful entrepreneurship in low income and infant market economies motivates this study and we investigate the impacts of institutional factors on firm growth in such economies. We use a firm-level dataset within the country's boundaries to explore the impacts of the institutional environment on firm growth in Vietnam.

Most previous studies investigate the growth of firm on the basis of cross-sectional estimations with specifications of augmented covariates in firm characteristics. The cross-sectional data implies that the observed variables fully reflect the heterogeneity of firms, and represent factors affecting firm growth. However, firm growth can be affected by potentially observable variables, which are not included in the model. The unobserved heterogeneity can cause the coefficients to be biased. Panel data can help to control for the unobserved heterogeneity within the analysis of firm growth (Bigsten and Gebreeyesus, 2006). Making use of our panel dataset, we employ the dynamic setting to estimate the impact the institutional environment has on firm growth by means of the following general specification:

$$\Delta Y_{it} = \beta \Delta Y_{it-1} + \alpha I_{it} + \gamma X_{it} + \mu_i + u_{it} \quad (1)$$

Where ΔY_{it} represents firm growth, (I_{it}) the institutional variables, X_i the control variables, μ_i unobserved and time-invariant effects, and u_{it} the pure error term. As the control variables X_{it} compose the firm-specific covariates (Z_{it}) and the province-specific covariates (S_{it}), the equation (1) can be modified as follows:

$$\Delta Y_{it} = \beta \Delta Y_{it-1} + \alpha I_{it} + \theta Z_{it} + \rho S_{it} + \delta_i + v_i + u_{it} \quad (2)$$

δ_i are unobserved and firm-specific time-invariant effects, and v_i are unobserved and province-specific time-invariant effects.

A simple OLS estimation of the equation (2) will yield inconsistent results since the endogeneity issue arises when the growth of firms (left-hand side) is a function of firm-specific factors (δ_i) or of the lag of firm growth (ΔY_{it-1}). In order to get around the endogeneity issue, the instrumental variable method is applied. One way to do this is the first difference generalized method of moments (GMM) estimator, which was formed in 1991 by Arellano and Bond. This method can eliminate the unobserved firm effects by first differencing and employing the lagged values of all endogenous variables as

instruments. The first difference GMM estimators are consistent only in case of no serial correlation of the error term. However, our dataset does not ensure the absence of serial correlation. We therefore use the system GMM, which was proposed by Blundell and Bond in 1998. In the system GMM model, lagged differences of endogenous variables are additionally counted as instruments in different additional moments. The province-level variables are more likely to be exogenous to the firm since any specific firm has only minor impacts on provincial average. In addition, the existence of province-level variables and sector differentiation in estimations might help to control for macro factors which might affect institutional variables and firm growth.

2.4. The entrepreneur's human capital and firm growth

2.4.1. The entrepreneur's human capital and additional variables

To investigate the impacts of the entrepreneur's human capital on the growth of firms, we use the entrepreneur's level of education as the proxy for the entrepreneur's human capital. The entrepreneur's education (EDU) is measured as a dichotomous variable, which receives 1 if the entrepreneur has a university degree or higher (Colombo and Grilli, 2005; Capelleras and Rabetino, 2008; Capelleras and Hoxha, 2010). Some of the entrepreneur's characteristics are added as control variables in this part. Gender of the entrepreneur (MALE) is added to the model and is coded 1 if the entrepreneur is male. The entrepreneur's age (AGE_ENT) is a numeric variable and measured in years at the survey time. Other control variables presented in the previous part are also included.

2.4.2. Samples

To respond to *hypothesis 2* regarding the role of human capital, we match the first with the second data source. Since the data regarding the entrepreneur's education are available only for the years 2008 and 2009, the balanced sheet of data contains these two periods only. After the matching process, the new dataset is a balanced panel with

38,293 enterprises including 1,573 agricultural firms, 15,720 industrial firms, and 21,018 service firms. Table 2 reports some entrepreneurial characteristics. The share of entrepreneurs that have a university degree is 72% which is higher than that in Argentina, Brazil, Mexico, and Peru (Capelleras and Rabetino, 2008) or in Kosova (Capelleras and Hoxha, 2010). Most firms (78%) are headed by a male. This figure is comparable to those in other developing economies (Coad and Tamvada, 2012; Capelleras and Rabetino, 2008) but much higher than that in transitional and developed economies (Capelleras and Hoxha, 2010; Tomczyk *et al.*, 2013). The average age of entrepreneurs is 47, which is equal to that in the research of Tomczyk *et al.* (2013) and is higher than those in Capelleras and Rabetino (2008) or Capelleras and Hoxha (2010).

2.4.3. Methodology

In line with the theoretical ideas of Gries and Naude (2011)⁴, the firm-level dataset allows us to examine the effects of the entrepreneur's education on firm performance in Vietnam. To respond to *hypothesis 2*, we re-modify equation (2):

$$\Delta Y_{it} = \beta EDU_{it} + \alpha I_{it} + \theta Z_{it} + \rho S_{it} + \delta_i + v_i + u_{it} \quad (3)$$

Because of the plain of short panel data, we estimate equation (3) with either fixed effects (FE) or random effects (RE) estimators. In order to choose consistent estimators, the paper uses a double-check procedure for the estimation selection. The first check employs the Hausman test for fixed effects. Under the null hypothesis that the effects are random, the Hausman test will compare the coefficients of time-varying regressors. In the second step, we compare FE and RE estimators with the existence of cluster-robust standard errors. The Sargan-Hansen test is used for this selection process. The results of these two tests lead us to select consistent estimators. In order to yield robust results without being confronted with the threads of heteroskedasticity, the estimations with cluster-robust standard errors will be applied.

⁴ Which states that human development will associate with a higher degree of entrepreneurial functioning

3. The results

3.1. The institutional environment and firm growth

In this section, the results will be presented and first we will concentrate on the response to *hypothesis 1*. We expect that higher scores on the institutional indicator-scale, which represents a more favorable institutional environment for a firm's operations, will associate with higher growth rates of firms.

Table 3 reports the estimations using the system GMM to identify the effects of the institutional environment on firm growth regarding employment and capital. The first three columns are for employment growth of firms in the agriculture, industry, and service sectors. The firm-level capital growth for each of the three sectors respectively, is presented in the last three columns.

Within the process of conducting the system GMM estimations, we firstly run and compare various specifications based on different sets of instruments. These sets of instruments include all exogenous variables plus different lags of endogenous variables such as first lags, second lags, and third lags with and without earlier lags. Within these sets, the number of exogenous variables is fixed whereas the number of lagged endogenous instruments varies according to different estimations. On the basis of the Sargan and Hansen test of overidentification, the set of instruments including exogenous variables and earlier lags of endogenous variables passes the overidentification restrictions. Thus, table 3 presents the system GMM estimations with exogenous variables as well as earlier lags of endogenous variables as instruments, which can provide consistent and reasonable estimates of interests. Since there is evidence of an unequal variance of the error term, which causes heteroscedasticity, we compute all estimations with robust standard errors.

Table 3: Estimation of impacts of the institutional environment on firm growth using the system GMM

VARIABLES	Employment growth			Capital growth		
	Agriculture	Industry	Service	Agriculture	Industry	Service
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	1.449 (2.143)	0.371 (0.327)	-0.011 (0.179)	-0.943 (0.651)	0.920** (0.395)	4.456*** (1.514)
Emp_growth _{t-1}	-1.337*** (0.510)	-0.907 (0.720)	-0.016 (0.273)			
Cap_growth _{t-1}				-1.233*** (0.256)	-1.198*** (0.134)	-1.105*** (0.123)
ENTRYCOST	0.010 (0.027)	0.008 (0.017)	0.006 (0.007)	0.023 (0.025)	-0.023* (0.013)	0.001 (0.013)
LANDACCESS	0.017 (0.036)	0.032** (0.014)	0.011 (0.007)	0.016 (0.025)	0.080*** (0.016)	0.036*** (0.012)
TRANSPARENCY	-0.047 (0.040)	-0.030* (0.017)	-0.012 (0.011)	-0.047* (0.026)	-0.026** (0.012)	-0.019 (0.012)
TIMECOST	-0.010 (0.015)	-0.014 (0.010)	0.002 (0.004)	0.016 (0.020)	0.008 (0.009)	0.031*** (0.007)
INFORMALCHARGE	0.100*** (0.036)	0.020 (0.024)	-0.017* (0.009)	0.092** (0.040)	0.038** (0.016)	0.026* (0.015)
PROACTIVITY	-0.009 (0.013)	-0.008 (0.010)	0.014* (0.008)	-0.001 (0.017)	-0.034*** (0.011)	-0.009 (0.008)
SUPPORTSERVICE	0.039* (0.023)	0.038** (0.017)	0.010** (0.004)	0.050** (0.022)	0.045*** (0.009)	0.017** (0.008)
LABORTRAIN	-0.022 (0.025)	-0.023* (0.013)	-0.014** (0.006)	-0.030 (0.027)	-0.030*** (0.011)	-0.000 (0.013)
LEGAL	-0.022 (0.020)	-0.011 (0.015)	-0.002 (0.005)	-0.012 (0.020)	-0.027** (0.012)	-0.029*** (0.010)
STRUCTURE	-0.067 (0.342)	0.252* (0.143)	0.049 (0.043)	0.916* (0.476)	-0.205 (0.171)	0.322 (0.244)
PUBLIC	-3.123 (2.801)	0.120 (0.485)	0.266 (0.257)	-0.047 (0.666)	-0.441 (0.664)	-3.615** (1.674)
PRIVATE	-1.526 (1.983)	-0.288 (0.370)	0.076 (0.173)	0.324 (0.672)	-0.577 (0.459)	-4.373*** (1.522)
SIZE	-0.015 (0.034)	-0.080** (0.039)	0.002 (0.002)	0.000 (0.013)	-0.121*** (0.045)	-0.024* (0.014)

AGE	0.024	-0.017***	-0.006**	-0.004	-0.017***	-0.035***
	(0.017)	(0.005)	(0.003)	(0.005)	(0.004)	(0.006)
NORTH	-0.083	-0.006	0.075***	0.054	0.084***	0.085***
	(0.078)	(0.022)	(0.019)	(0.087)	(0.028)	(0.027)
SOUTH	-0.267	-0.052	0.019**	0.146	-0.107	0.015
	(0.206)	(0.062)	(0.008)	(0.098)	(0.069)	(0.031)
URBAN	-0.039	0.077	0.120***	-0.565**	0.069	-0.212*
	(0.421)	(0.086)	(0.035)	(0.221)	(0.070)	(0.117)
POPULATION	-0.004**	0.000	0.000	-0.004*	-0.000	-0.002
	(0.002)	(0.001)	(0.001)	(0.003)	(0.001)	(0.002)
STUDENT	-0.001	0.000	-0.000**	0.002*	0.002***	0.002***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
INVESTMENT	0.000	-0.000	-0.000***	0.000	-0.001**	-0.001**
	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Diagnostic tests						
Sargan overidentification	8.09 [.15]	8.23 [.08]	2.73 [.74]	14.96 [.13]	2.27 [.52]	8.54 [.38]
Hansen overidentification	8.09 [.15]	7.69 [.10]	7.95 [.16]	15.88 [.10]	2.18 [.54]	12.04 [.15]
Instruments	27	26	27	32	25	30
Observations	3,988	45,314	58,349	3,988	45,314	58,241
Number of enterprises	1,472	15,639	20,677	1,472	15,639	20,674

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Entry costs and firm growth: the entry costs seem to have no effect on the growth rate of firms, except for the negative impacts on the growth of firm capital in the industry sector. This is because the major concerns in respect to entry costs is related to the start-up process of entrepreneurship such as the time to register, to acquire licenses as well as the number of licenses needed. The establishment of new branches which is part of the growth process of firms has also to fulfill these administrative requirements. Firms may have become familiar with all the procedures leading to the fact that this factor has no impacts. Another reason may be that there exists little difference in entry costs across provinces, i.e. the time to receive all necessary licenses and the number of licenses are uniquely adopted in the whole country and are nationally regulated.

Land access and security of tenure: The openness of land access and the security of tenures seem to be important to firm growth. Easier access to land and more security of land tenures once land is already acquired, will result in higher growth rates of firms. Land and its tenures is always connected with agricultural enterprises, however we do not find any significant evidence for the fact that land access and land tenures influence the performance of these firms. One reason may be that the quality of land is more important than the quantity of land for agricultural firms and the growth depends on the investment such as increasing land fertility or applying new techniques to increase the land output. Industrial firms are largely affected by this factor in both areas: employment and capital growth. These outcomes may result from the construction investment such as buildings and machinery, which absorb much of firm resources. The ease to access land and high security of land tenure will assure industrial firms to have rights and possibilities for a long-term production. Land access and tenure are also found to have effects on capital growth of service firms.

Transparency and access to information: the results indicate that a higher level of transparency will associate with lower growth rates of firms. This relationship is significant in respect to the employment growth of industrial firms and the capital growth of industrial and also agricultural firms. This indicator seems to have no significant impacts on the growth rate of firms operating in the service sector. The negative impacts may result from the fact that in active markets, new laws and policies have not been well communicated to specific firms. Such markets will attract and contain a large number of firms, which then can be overwhelmed by the local authority's ability to fully cover communication with all individual firms within the province. The insufficient connectivity between the local authority and firms may result in the fact that these provinces receive lower scores at this indicator.

Time costs of regulatory compliance: A relatively high value of this index indicates a reduced waste of time for bureaucratic compliance and local inspections. The variable has a significant influence on capital growth of service enterprises while it does not impact firms in other sectors. The insignificance of this indicator when it comes to agricultural and industrial firms may imply that bureaucratic compliance processes are very similar across provinces. In addition, the frequency of inspections by local regulatory agencies has been regulated at the national level, thus the number of inspections may be comparable across all firms and all sectors.

Informal charges: less informal charges will generally support higher growth rates of firms. This indicator fully supports *hypothesis 1* regarding the capital growth of firms as we find positive and significant impacts across all types of firms. The results imply that less extra fees will promote firm growth. Our findings are similar to those of some previous literature (Aidis, 2005; Krasniki, 2007; Capelleras and Hoxha, 2010; Nguyen

and Dijk, 2012). However, when it comes to the effect informal charges have on employment growth, we find a positive relationship.

Proactivity of provincial leadership: The influence of proactivity on firm growth is rather moderate. We find that the employment growth of service firms is positively related to proactivity whereas proactivity impacts capital growth of industrial firms negatively.

Business support services: the support services seem to be the most important institutional factor that promotes growth of enterprises in Vietnam. It is found that higher levels of business support such as trade promotion, information provision, business partner matchmaking, technological services as well as the quality of these services, will foster firm growth. So, this kind of support services can be considered growth incentives. Our result is supported by the study of Hansen *et al.* (2009), as they also found that initial government assistance has positive impacts on firm growth. This finding is relatively close to the matching theory of Gries and Naude (2011) as a match between support services, given by local government, and the business plan, ability, or vision of enterprises appears and this match is absorbed by the firms leading to growth or expansion.

Labor and training: the results indicate that provincial efforts to promote vocational training and skill development for local industries relate negatively to growth rates of industrial firms. This variable also affects employment growth of service firms while there is no evidence for any influence on agricultural firms. The negative impacts on industrial firms may have two reasons. Firstly, more efforts of local authorities are made in those provinces, where the labor skills and techniques are relatively low and firms in these sites grow slower than those in other provinces. The second reason may be that although the provincial government in some cases is putting more attention to

vocational training programs, this attention alone is not sufficient to improve the quality of regional workers. The lack of qualified workers can thus result in lower growth rates of firms compared to those in other provinces.

Legal institutions: this subjectively perceived factor affects capital growth of industrial and service firms negatively. It is revealed that firms experiencing higher growth rates have less faith in the stability of provincial legal institutions and in the possibility that local institutions can be an effective way for dispute solving. The firm's negative attitude towards local institutions is understandable because of the instability of legal regulations and laws in most developing economies. In these economies, the application and effectuation of laws and regulations by legal institutions may vary across provinces as the local authorities can use their power to (i) issue new sub-regulations that directly influence the business performance, (ii) intervene in the dispute resolutions, or (iii) cover themselves against the appeal of an investigation of corrupt behavior. Entrepreneurs who made experiences of this kind or are in skeptical of the local administration and its ambitions may forecast eventual adverse impacts in the future. Therefore, they may already prepare solutions for any negative effects resulting from the behavior and sanctions enforced by legal institutions, and thus their resulting losses may be less severe in the case of adverse selections.

Turning to control variables, in most specifications, firm age coefficients receive negative values and they are statistically significant in industrial and service sectors. It means that the Gibrat's LPE does not hold in the case of industrial and service firms in both: employment growth and capital growth aspects. Our results find that older enterprises grow slower than younger ones regarding firms active in the industry or service sector. This finding is supported by previous literature e.g. Sleuwaegen and Goedhuys (2002), Honjo and Harada (2006), Tuan and Yoshi (2009), Coad and Tamada

(2012), and Wang and You (2012). One common feature is that except for the study of Honjo and Harada (2006), which concerns Japanese data, the other also concerned developing economies such as Cote I'voire, India, or China. Most studies which rejected Gibrat's Law and therefore found positive relationships between firm age and firm growth used data from developed and transitional economies. This may indicate how different economic environment is in developing economies when comparing with more advanced economies. An economic boom in developing economies may create more growth opportunities for those firms, which are relatively new, as compared to the older firms. We find no statistical evidence for a firm age effect on firm growth in agricultural enterprises. Firm size is found to have negative impacts on growth of industrial firms. This is in accordance with most of the theoretical and empirical literature on firm dynamics (Sleuwaegen and Goedhuys, 2002; Honjo and Harada, 2006; Capelleras and Hoxha, 2010; Mateev and Anastasov, 2010; Park *et al.*, 2010; Coad and Tamada, 2012, etc) since mature firms tend to grow at lower rates than smaller ones. This indicates the diminishing returns of size to firm growth. However, the impacts of size on growth of agricultural and service firms are not clear and statistically insignificant.

Looking at firm characteristics, the coefficients of capital structure are positive and statistically significant in employment growth of industrial firms and capital growth of agricultural firms. These are consistent to the study of Honjo and Harada (2006), in which capital structure was found to have impacts on firm growth and these impacts vary across dependent variables. Other specifications propose that the debt to total assets rate negatively enters the growth equations or equals zero. These findings were launched by the empirical study of Honorati and Mengistae (2007) as they used the same system GMM estimation for firm growth and generally found very little evidence

for any impacts the capital structure may have on firm growth. Our results lead to the same conclusion, namely that firm growth is not financially constrained.

The influence of firm ownership on firm growth is not clear, except for the capital growth rate of service firms. In this case, we find that public and private ownership influence firm growth negatively. That means firms whose majority shareholder is the public or private sector, grow at a lower rates compared to firms with foreign majority shareholders. The legal ownership structure has no significant influence on firm growth in other specifications. Our results are partially contradicting the study of Hansen *et al.* (2009), in which household firms are found to experience lower revenue growth rates compared to larger sole proprietorship firms, cooperatives, and limited liability firms. The reason for the results may come from differences in the sample classification and in the sample size. While we classify all firms on the basis of ownership, Hansen *et al.* (2009) base their classification on the formal registration of a given firm, and they also exclude foreign firms from the sample. The second reason for the difference in results may be that Hansen *et al.* (2009) use a much smaller sample compared to ours. The effects of a firm's location on growth are statistically significant for service firms. The findings meet the expectation that firms in the north and the south, where the two largest economic centers, Hanoi and Hochiminh City are located, will experience higher growth rates than those in the center of Vietnam.

Regarding the provincial characteristics, the urbanization rate coefficient is significant in service firms, which accordingly experience higher employment growth, but lower capital growth. Agriculture firms are found to be negatively affected by a high rate of urbanization, while there is no influence of urbanization found in other specifications. The negative impact of the urbanization rate on the growth of agriculture firms may be the result of the industrialization and urbanization process, which began with the

implementation of economic reforms in 1986. Since that time, the government has concentrated on the industry and service sector. The reform switched the economic regime from a centrally-planned economy to a market-oriented economy. The reform has pushed the economy forward, which has been going hand in hand with an increasing urban population and some of these newly arising townsmen lost their cultivated shields to industrial enterprises.

Population growth seems to have no impact on firm growth. Its coefficients are mostly statistically insignificant in all specifications. The variable used to measure public investment has significant and negative signs in industrial or service firms. It implies that firms will grow faster in provinces that have lower average public investment. In Vietnam, the government often calls for investment from the private and foreign sector in all areas, including infrastructure (e.g. building new roads and bridges in the form of build-operate-transfer). Public investment is often conducted in areas where there is a lack of private and foreign investment such as schools, hospitals, and infrastructure in remote areas. Therefore, areas where private and foreign investment finds less economic opportunity, and thus leading to slower firm growth, may experience a higher public investment per capita in order to compensate for the missing private and foreign investment flow. The proxy for the quality of human capital, the number of students per capita, has strong impacts on capital growth and less influences on the employment growth of firms. This indicates that a higher quality of labor in the area will associate with higher growth rates of firm capital. The influence of labor quality on employment growth is not strong, as this variable is only found to impact service firms.

In sum, the empirical results divide institutional factors into two groups. The first group statistically supports *hypothesis 1* which states that higher levels on the institutional environment scale will associate with higher growth rates of firms. This group includes

the factors: business support service, land access, time costs, and informal charges. The second group, including the factors: entry costs, transparency, proactivity, labor and training, and legal institutions, does not give significant evidence to support our *hypothesis 1*. The results also indicate that the most significant effects these factors provoke, are related to the capital growth, rather than the employment growth of firms.

3.2. The entrepreneur's human capital and firm growth

Table 4 presents the estimations of employment and capital growth using the fixed-effects (FE) model. The Hausman test indicates a highly and statistically significant difference. This leads to the rejection of the null hypothesis and thus the FE model will yield the consistent estimators. The Sargan-Hansen test also strongly rejects the null hypothesis of RE and we can therefore conclude that the FE models are more appropriate. Therefore FE estimators with cluster-robust standard errors are selected.

Table 4: Estimation of impacts of the entrepreneur's education on firm growth using fixed-effects estimations

VARIABLES	Employment growth			Capital growth		
	Agriculture	Industry	Service	Agriculture	Industry	Service
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-3.938*	1.032	0.835**	-1.924	-2.299***	-2.221***
	(2.102)	(0.766)	(0.408)	(1.195)	(0.348)	(0.471)
ENTRYCOST	0.027	-0.100**	-0.029	-0.039	-0.018	0.004
	(0.116)	(0.041)	(0.031)	(0.040)	(0.018)	(0.024)
LANDACCESS	-0.161**	0.013	0.036*	-0.073**	-0.013	0.007
	(0.063)	(0.026)	(0.019)	(0.031)	(0.012)	(0.013)
TRANSPARENCY	0.273	0.079**	-0.020	-0.030	0.015	0.012
	(0.223)	(0.037)	(0.020)	(0.029)	(0.017)	(0.011)
TIMECOST	0.071	-0.012	0.015	-0.026	-0.018	0.007
	(0.072)	(0.029)	(0.015)	(0.039)	(0.013)	(0.010)
INFORMALCHARGE	-0.023	0.003	0.039	0.073*	-0.010	-0.029**
	(0.090)	(0.041)	(0.028)	(0.041)	(0.017)	(0.015)
PROACTIVITY	-0.039	-0.045*	-0.016	0.009	-0.004	-0.015
	(0.127)	(0.024)	(0.018)	(0.035)	(0.012)	(0.010)
SUPPORTSERIVIVE	-0.211	-0.054**	-0.002	0.007	-0.031***	-0.017*
	(0.154)	(0.027)	(0.012)	(0.033)	(0.011)	(0.010)
LABORTRAIN	0.355***	0.031	-0.013	0.013	0.032*	0.017
	(0.130)	(0.038)	(0.020)	(0.048)	(0.017)	(0.014)
LEGAL	-0.189**	0.055*	0.006	0.033	0.005	-0.004
	(0.082)	(0.032)	(0.022)	(0.026)	(0.012)	(0.012)
EDUCATION	0.710**	-0.049	0.093**	-0.014	-0.022	0.047*
	(0.327)	(0.051)	(0.037)	(0.067)	(0.022)	(0.026)
AGE_ENT	0.030	-0.004	-0.002	0.000	-0.000	0.019
	(0.018)	(0.005)	(0.003)	(0.002)	(0.002)	(0.017)
MALE	0.526	-0.081	-0.048	0.019	0.083**	-0.542
	(0.465)	(0.144)	(0.066)	(0.074)	(0.040)	(0.533)
STRUCTURE	0.063	0.013	0.002**	0.841***	0.233***	0.002
	(0.333)	(0.028)	(0.001)	(0.243)	(0.077)	(0.004)
PUBLIC	-0.234	0.155	-0.114	-0.654***	-0.094	-0.271
	(0.364)	(0.156)	(0.081)	(0.193)	(0.098)	(0.199)

PRIVATE	0.030 (0.285)	0.075 (0.097)	-0.138* (0.075)	-0.600*** (0.149)	-0.086 (0.094)	-0.279 (0.185)
AGE	0.061 (0.131)	-0.021 (0.051)	-0.022 (0.028)	0.216*** (0.082)	0.263*** (0.026)	0.257*** (0.021)
SIZE	0.271 (0.241)	-0.211 (0.143)	0.013 (0.013)	-0.987*** (0.238)	-0.680*** (0.132)	-0.018 (0.034)
URBAN	2.966 (2.809)	-0.316 (0.689)	-0.483 (0.565)	0.654 (1.999)	0.620* (0.366)	-0.359 (0.344)
POPULATION	-0.003 (0.006)	-0.002 (0.002)	-0.003 (0.002)	0.000 (0.002)	-0.001 (0.001)	0.003 (0.002)
STUDENT	0.002 (0.035)	0.005 (0.008)	-0.002 (0.005)	-0.003 (0.015)	-0.001 (0.004)	0.004 (0.005)
INVESTMENT	-0.008* (0.004)	-0.000 (0.001)	-0.001 (0.001)	-0.003** (0.001)	-0.001** (0.000)	-0.001 (0.001)
Hausman FE vs. RE	128.51	179.62	234.12	64.94	525.33	174.39
p-value	[.00]	[.00]	[.00]	[.00]	[.00]	[.00]
Sargan-Hansen statistic	86.34	73.24	163.72	504.8	229.75	n.a.
p-value	[.00]	[.00]	[.00]	[.00]	[.00]	n.a.
Observations	3,130	30,561	40,070	3,130	30,561	40,070
Number of enterprises	1,573	15,702	21,018	1,573	15,702	21,018

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The results partly confirm *hypothesis 2* that the human capital development of the entrepreneur will associate with a higher degree of firm performance or that a higher level of the entrepreneur's education will result in higher growth rates of firms. Unlike other studies such as those of Hansen *et al.* (2009), and Tuan and Yoshi (2009) which found no statistically significant evidence of educational effects on firm growth, our study finds that the entrepreneur's education has significant impacts on firm growth in some cases. The positive coefficients of the entrepreneur's education imply that enterprises headed by entrepreneurs with a solid educational background are more likely to experience growth rates above the average. Using a dummy variable, we find that the entrepreneur's education has a significant influence on the employment growth of agricultural and service firms as well as capital growth within service firms. However, the entrepreneur's education does not affect growth rates of industrial firms; neither employment growth, nor capital growth. The growth of agricultural firms is also independent from their entrepreneurs' education.

4. Conclusions

Using a large-scale survey of all enterprises in Vietnam we investigate two hypotheses, drawing from the theoretical literature of Gries and Naude (2011), relating to firm success. *Hypothesis 1* states that a higher level of institutional factors will lead to firm growth in both, employment and capital dimensions. We use a balanced panel dataset consisting of a sample of 37,788 enterprises, applying system GMM estimators. Our data comes from the yearly censuses conducted by the GSO. In order to create a balanced panel dataset including all required variables, our period of investigation spans from 2006 to 2009. To make a detailed picture of the economy, we divide enterprises according to their sector of operation into the three groups: agriculture, industry and service. Firm growth is considered in two dimensions: employment growth and capital

growth. The results show that institutional factors such as business support service, land access, time costs, and informal charges empirically confirm *hypothesis 1*, saying that a higher level of institutional environment scores will associate with higher growth rates of firms. However, we find that some institutional factors such as entry costs, transparency, proactivity, labor and training, and legal institutions do not support this hypothesis. The findings indicate an interesting result, namely that the impacts of institutional factors are not similar between employment growth and capital growth. More robust results are found when it comes to the capital growth of firms.

Within *hypothesis 2*, we examine whether the entrepreneur's education matters for firm growth. For data availability reasons, we form a balanced panel dataset with a two-year period from 2008 to 2009, including 38,293 enterprises in three sectors. Since the dataset is a short panel, we employ the fixed-effect model, which is proven to give more consistent estimates than the random effect model. Our results indicate that *hypothesis 2*, saying that a higher level of the entrepreneur's education will result in higher growth rates of firms, is partially supported. The hypothesis is confirmed regarding employment and capital growth of service firms as well as regarding employment growth of agricultural firms. However, we find no significant impacts of the entrepreneur's education on employment growth and capital growth of industrial firms, and capital growth of agricultural firms.

APPENDIX

Appendix 1: Definitions of institutional factors

Variable	Full name	Definition
ENTRYCOST	Entry Costs	Provincial index that measures of 1) the time it takes a firm to register and acquire land; 2) the time to receive all the necessary licenses needed to start a business; 3) the number of licenses required to operate a business; and 4) the perceived degree of difficulty to obtain all licenses/permits.
LANDACCESS	Land Access and Security of Tenure	Provincial index that combines two dimensions of the land problems confronting entrepreneurs-how easy it is to access land and the security of tenure once land is acquired.
TANSPARENCY	Transparency and Access to Information	Provincial index that measures whether or not firms have access to the proper planning and legal documents necessary to run their businesses, whether or not those documents are equitably available, whether or not new policies and laws are communicated to firms and predictably implemented, and the business utility of the provincial webpage.
TIMECOST	Time Costs of Regulatory Compliance	Provincial index that measures how much time firms waste on bureaucratic compliance, as well as how often and for how long firms must shut their operations down for inspections by local regulatory agencies. This year, the index also includes a battery of indicators measuring progress on public administration reform (PAR).
INFORMALCHARGE	Informal charges	Provincial index that measures how much firms pay in informal charges, how much of an obstacle those extra fees pose for business operations, whether or not payment of those extra fees results in expected results or “services,” and whether or not provincial officials use compliance with local regulations to extract rents.
PROACTIVITY	Proactivity of Provincial Leadership	Provincial index that measures the overall attitude of provincial officials as well as their creativity and cleverness in implementing central policy, designing their own initiatives for private sector development, and working within sometimes unclear national regulatory frameworks to assist and interpret in favor of local private firms.

SUPPORTSERVICE	Business Support Services	Provincial index that measures the availability of business services, such as private sector trade promotion, provision of regulatory information to firms, business partner matchmaking, and technological services for firms; the number of private providers of these services; and the quality of these services.
LABORTRAIN	Labor and Training	Provincial index that measures the efforts by provincial authorities to promote vocational training and skills development for local industries and to assist in the placement of local labor.
LEGAL	Legal Institutions	Provincial index that measures the private sector's confidence in provincial legal institutions; whether or not firms regard provincial legal institutions as an effective vehicle for dispute resolution or as an avenue for lodging appeals against corrupt official behavior.

Appendix 2: Impacts of the entrepreneur's education on firm growth using random-effects estimations

VARIABLES	Employment growth			Capital growth		
	Agriculture (1)	Industry (2)	Service (3)	Agriculture (4)	Industry (5)	Service (6)
Constant	-0.179 (0.444)	0.969*** (0.274)	0.228 (0.140)	-0.004 (0.231)	0.221** (0.109)	0.239*** (0.089)
ENTRYCOST	-0.013 (0.065)	-0.085** (0.033)	-0.005 (0.020)	-0.052* (0.029)	-0.016 (0.014)	0.001 (0.013)
LANDACCESS	-0.021 (0.041)	0.011 (0.019)	0.038*** (0.013)	-0.051*** (0.019)	0.023*** (0.009)	0.025** (0.010)
TRANSPARENCY	0.160*** (0.048)	0.009 (0.023)	-0.023** (0.011)	-0.037* (0.021)	-0.021** (0.011)	-0.012* (0.007)
TIMECOST	-0.019 (0.026)	-0.015 (0.012)	-0.002 (0.007)	0.058*** (0.016)	0.076*** (0.006)	0.075*** (0.005)
INFORMALCHARGE	-0.044 (0.035)	-0.035 (0.030)	-0.018 (0.016)	0.097*** (0.034)	-0.055*** (0.013)	-0.084*** (0.012)
PROACTIVITY	-0.088** (0.042)	-0.018 (0.013)	0.017** (0.008)	-0.011 (0.020)	-0.032*** (0.006)	-0.010* (0.005)
SUPPORTSERIVICE	-0.170*** (0.046)	-0.052*** (0.018)	0.007 (0.008)	0.054** (0.022)	-0.019** (0.008)	0.021*** (0.007)
LABORTRAIN	0.140** (0.064)	0.026 (0.024)	-0.031** (0.013)	-0.063** (0.028)	0.023** (0.012)	-0.021** (0.009)
LEGAL	0.036 (0.033)	0.084*** (0.024)	0.002 (0.013)	0.042* (0.022)	0.025*** (0.010)	0.020** (0.008)
EDUCATION	0.183* (0.104)	0.028 (0.021)	0.026** (0.012)	-0.037 (0.029)	-0.012 (0.010)	0.002 (0.008)
AGE_ENT	0.001 (0.002)	-0.006*** (0.001)	-0.003*** (0.001)	-0.003** (0.001)	-0.004*** (0.000)	-0.004*** (0.001)
MALE	0.109*** (0.039)	0.052* (0.028)	0.038*** (0.011)	-0.043 (0.029)	0.057*** (0.009)	0.013 (0.012)
STRUCTURE	-0.051 (0.072)	-0.001 (0.005)	0.002 (0.001)	0.316*** (0.066)	0.018 (0.018)	0.004 (0.006)
PUBLIC	-0.034 (0.067)	0.059*** (0.019)	-0.022 (0.019)	0.115** (0.050)	0.064*** (0.012)	-0.025 (0.020)

PRIVATE	0.270*** (0.078)	0.221*** (0.018)	0.133*** (0.017)	0.229*** (0.052)	0.163*** (0.008)	0.091*** (0.023)
AGE	0.001 (0.002)	-0.009*** (0.001)	-0.003** (0.001)	-0.002* (0.001)	-0.004*** (0.000)	-0.004*** (0.001)
SIZE	-0.001 (0.002)	0.001 (0.013)	0.002 (0.001)	0.000 (0.001)	-0.015*** (0.005)	0.001 (0.001)
URBAN	0.155 (0.204)	0.041 (0.065)	0.040 (0.036)	-0.197* (0.113)	-0.187*** (0.023)	-0.141** (0.057)
POPULATION	-0.005*** (0.002)	-0.000 (0.001)	-0.001 (0.001)	0.003*** (0.001)	0.004*** (0.001)	0.005*** (0.001)
STUDENT	-0.001 (0.002)	0.001** (0.001)	-0.000 (0.000)	0.000 (0.001)	0.001*** (0.000)	0.000 (0.000)
INVESTMENT	-0.001** (0.000)	-0.000 (0.000)	0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Hausman FE vs. RE	128.51	179.62	234.12	64.94	525.33	174.39
[p-value]	[.00]	[.00]	[.00]	[.00]	[.00]	[.00]
Sargan-Hansen statistic	86.34	73.24	163.72	504.8	229.75	n.a.
[p-value]	[.00]	[.00]	[.00]	[.00]	[.00]	n.a.
Observations	3,130	30,561	40,070	3,130	30,561	40,070
Number of enterprises	1,573	15,702	21,018	1,573	15,702	21,018

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

VARIABLES	Employment growth			Capital growth		
	Agriculture (1)	Industry (2)	Service (3)	Agriculture (4)	Industry (5)	Service (6)
Constant	-0.179 (0.444)	0.969*** (0.274)	0.228 (0.140)	-0.004 (0.231)	0.221** (0.109)	0.239*** (0.089)
ENTRYCOST	-0.013 (0.065)	-0.085** (0.033)	-0.005 (0.020)	-0.052* (0.029)	-0.016 (0.014)	0.001 (0.013)
LANDACCESS	-0.021 (0.041)	0.011 (0.019)	0.038*** (0.013)	-0.051*** (0.019)	0.023*** (0.009)	0.025** (0.010)
TRANSPARENCY	0.160*** (0.048)	0.009 (0.023)	-0.023** (0.011)	-0.037* (0.021)	-0.021** (0.011)	-0.012* (0.007)
TIMECOST	-0.019	-0.015	-0.002	0.058***	0.076***	0.075***

	(0.026)	(0.012)	(0.007)	(0.016)	(0.006)	(0.005)
INFORMALCHARGE	-0.044	-0.035	-0.018	0.097***	-0.055***	-0.084***
	(0.035)	(0.030)	(0.016)	(0.034)	(0.013)	(0.012)
PROACTIVITY	-0.088**	-0.018	0.017**	-0.011	-0.032***	-0.010*
	(0.042)	(0.013)	(0.008)	(0.020)	(0.006)	(0.005)
SUPPORTSERIVIVE	-0.170***	-0.052***	0.007	0.054**	-0.019**	0.021***
	(0.046)	(0.018)	(0.008)	(0.022)	(0.008)	(0.007)
LABORTRAIN	0.140**	0.026	-0.031**	-0.063**	0.023**	-0.021**
	(0.064)	(0.024)	(0.013)	(0.028)	(0.012)	(0.009)
LEGAL	0.036	0.084***	0.002	0.042*	0.025***	0.020**
	(0.033)	(0.024)	(0.013)	(0.022)	(0.010)	(0.008)
EDUCATION	0.183*	0.028	0.026**	-0.037	-0.012	0.002
	(0.104)	(0.021)	(0.012)	(0.029)	(0.010)	(0.008)
AGE_ENT	0.001	-0.006***	-0.003***	-0.003**	-0.004***	-0.004***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
MALE	0.109***	0.052*	0.038***	-0.043	0.057***	0.013
	(0.039)	(0.028)	(0.011)	(0.029)	(0.009)	(0.012)
STRUCTURE	-0.051	-0.001	0.002	0.316***	0.018	0.004
	(0.072)	(0.005)	(0.001)	(0.066)	(0.018)	(0.006)
PUBLIC	-0.034	0.059***	-0.022	0.115**	0.064***	-0.025
	(0.067)	(0.019)	(0.019)	(0.050)	(0.012)	(0.020)
PRIVATE	0.270***	0.221***	0.133***	0.229***	0.163***	0.091***
	(0.078)	(0.018)	(0.017)	(0.052)	(0.008)	(0.023)
AGE	0.001	-0.009***	-0.003**	-0.002*	-0.004***	-0.004***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
SIZE	-0.001	0.001	0.002	0.000	-0.015***	0.001
	(0.002)	(0.013)	(0.001)	(0.001)	(0.005)	(0.001)
URBAN	0.155	0.041	0.040	-0.197*	-0.187***	-0.141**
	(0.204)	(0.065)	(0.036)	(0.113)	(0.023)	(0.057)
POPULATION	-0.005***	-0.000	-0.001	0.003***	0.004***	0.005***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
STUDENT	-0.001	0.001**	-0.000	0.000	0.001***	0.000
	(0.002)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)
INVESTMENT	-0.001**	-0.000	0.000***	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Hausman FE vs. RE	128.51	179.62	234.12	64.94	525.33	174.39
p-value	[.00]	[.00]	[.00]	[.00]	[.00]	[.00]
Sargan-Hansen statistic	86.34	73.24	163.72	504.8	229.75	n.a.
p-value	[.00]	[.00]	[.00]	[.00]	[.00]	n.a.
Observations	3,130	30,561	40,070	3,130	30,561	40,070
Number of enterprises	1,573	15,702	21,018	1,573	15,702	21,018
Constant	-0.179	0.969***	0.228	-0.004	0.221**	0.239***

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

References

1. Aidis, R. (2005) *Institutional Barriers to Small- and Medium-sized Enterprise Operations in Transition Countries*. Small Business Economics, 25, p. 305-318.
2. Allen, F., Chakrabarti, R., De, S., Qian, J., and Qian, M. (2012) *Financing firms in India*. Journal of Financial Intermediation, 21, p. 409-445.
3. Aterido, R., and Hallward-Driemeier, M. (2007) *Impact of Access to Finance, Corruption and Infrastructure on Employment Growth: Does Sub-Saharan Africa Mirror Other Low-Income Regions*. Policy Research Working Paper 5218. World Bank, Washington.
4. Aterido, R., Hallward-Driemeier, M., and Pages, C. (2011) *Big Constraints to Small Firm's Growth? Business Environment and Employment Growth across Firms*. Economic Development & Cultural Change, Vol. 59, Issue 3, p. 609-647.
5. Biesebroeck, J. V. (2005) *Growth and Productivity Growth in African Manufacturing*. Economic Development and Cultural Change, Vol. 53, Issue 3, p.85-99.
6. Bigsten, A. and Söderbom, M. (2006). *What Have We Learned from a Decade of Manufacturing Enterprise Surveys in Africa?* The World Bank Research Observer 21(2): 241–65.
7. Burke, A., Fitzroy, F., and Nolan, M. (2000) *When Less is More: Distinguishing between Entrepreneurial Choice and Performance*. Oxford Bulletin of Economics and Statistics 62 (5), p. 565–587.
8. Cameron, A. C. and Trivedi, P. K. (2010) *Microeconometrics using Stata*. Stata Corp LP. Texas.
9. Capelleras, J. and Hoxha, D. (2010) *Start-up size and subsequent firm growth in Kosova: the role of entrepreneurial and institutional factors*. Post-Communist Economics, Vol. 22, No. 3, p. 411-426.
10. Capelleras, J. and Rabetino, R. (2008) *Individual, organizational and environmental determinants of new firms employment growth: Evidence from Latin America*. International Entrepreneurship and Management Journal, Vol. 4, Issue 1, p. 79-99.
11. Coad, A. and Tamvada, J. P. (2012) *Firm growth and Barriers to growth among small firms in India*. Small Business Economics (39), p. 383-400.

12. Colombo, M. G. and Grilli, L. (2005) *Founders' human capital and the growth of new technology-based firms: a competence-based view*. Research Policy (34), p. 795-816.
13. Dollar, D., Hallward-Driemeier, M., and Mengistae, T. (2005) *Business Climate and Firm Performance in Developing Economies*. Economic Development and Cultural Change 54, p. 1–31.
14. Dunne, T. and Huges, A. (1994) *Age, size, growth and survival UK companies in the 1980s*. Journal of Industrial Economics, Vol. 42, Issue 2, p. 115-140.
15. Dunne, T., Roberts, M. J., and Samuelson, L. (1989) *The growth and failure of U.S. manufacturing plants*. Quarterly Journal of Economics, Vol. 104, Issue 4, p. 671-698.
16. Fisman, R. and Svensson, J. (2007) *Are corruption and Taxation really harmful to growth? Firm level evidence*. Journal of Development Economics, 83, p. 63-75.
17. GSO (2013) The General Statistics Office. Hanoi.
18. Gries, T. and Naude, W. (2011) *Entrepreneurship and human development: a capability approach*. Journal of Public Economics, 95, p.216-224.
19. Hallward-Driemeier, M., Wallsten, S., and Xu, L. C (2006) *Ownership, investment climate and firm performance: Evidence from Chinese Firms*. Economic of Transition, Vol. 14, No. 4, p.629-647.
20. Hansen, H., Rand, J., and Tarp, F. (2009) *Enterprise Growth and Survival in Vietnam: Does Government Support Matter?* Journal of Development Studies, Vol. 45, No. 7, p. 1048-1069.
21. Honjo, Y. and Harada, N. (2006) *SME Policy, Financial Structure and Firm Growth: Evidence from Japan*. Small Business Economics (27), p. 289-300.
22. Honorati, M. and Mengistae, T. (2007) *Corruption, the Business Environment, and Small Business Growth in India*. Policy Research Working Paper 4338.
23. Krasniki, B. A. (2007) *Barriers to entrepreneurship and SME growth in transition: the case of Kosova*. Journal of Developmental Entrepreneurship, Vol. 12, No. 1, p.71-94.
24. Liu, J., Tsou, M., and Hammitt, J. K. (1999) *Do small plants grow faster? Evidence from Taiwan electronics industry*. Economic Letters, 65, p. 121-129.
25. Mateev, M. and Anastasov, Y. (2010) *Determinants of small and medium sized fast growing enterprises in Central and Eastern Europe: A panel data analysis*. Financial Theory and Practice, Vol. 34, Issue 3, p. 269-295.

26. McPherson, M. A. and Liedhorm, C. (1996) *Determinants of small and micro enterprise registration results from surveys in Niger and Swaziland*. World Development, Vol. 4, No. 3, p. 481-487.
27. Nguyen, T. T. and Dijk, M. A. V. (2012) *Corruption, growth and governance: Private vs. state-owned firms in Vietnam*. Journal of Banking & Finance, 36, p. 2935-2948.
28. Park, Y., Shin, J., and Kim, T. (2010) *Firm size, age, industrial networking, and growth: a case of the Korean manufacturing industry*. Small Business Economics, (35), p. 153-168.
29. PCI (2013) The Vietnam Provincial Competitiveness Index website.
30. Praag, C. M. (2006) *Venture Performance and Venture Inputs: The Role of Human and Financial Capital*. in The Life Cycle of Entrepreneurial Ventures. International Handbook Series on Entrepreneurship, Vol. 3, p. 507-533.
31. Reichstein, T. and Dahl, M. (2004) *Are firm growth rate random? Analyzing patterns and dependencies*. International review of Applied Economics, Vol. 18, No. 2, p. 225-246.
32. Sleuwaegen, L. and Goedhuys, M. (2002) *Growth of Firms in Developing Countries, evidence from Cote d'Ivoire*. Journal of Development Economics, Vol. 68, p. 117-135.
33. Tomczyk, D., Lee, J., and Winslow, E. (2013) *Entrepreneur's personal values, compensation, and high growth firm performance*. Journal of Small Business Management, Vol. 51, Issue 1, p. 66-82.
34. Tuan, N. P. and Yoshi, T. (2009) *Factors contributing to the growth of small and medium enterprises: An empirical analysis of Vietnam's manufacturing firms*. Singapore Management Review, Vol. 31, No. 2, p. 35-51.
35. Wang, Y. and You, J. (2012) *Corruption and Firm Growth: Evidence in China*. China Economic Review, 23, p. 415-433.
36. Yusada, T. (2005) *Firm Growth, Size, Age, and Behavior in Japanese Manufacturing*. Small Business Economics, 24, p. 1-15.

Recent discussion papers

2014-10	Thomas Gries Ha Van Dung	Institutional environment, human capital, and firm growth: Evidence from Vietnam
2014-09	Ha Van Dung	Short-term precaution, insurance and saving mechanisms in rural Vietnam
2014-08	Thomas Gries Ha Van Dung	Household Savings and Productive Capital Formation in Rural Vietnam: Insurance vs. Social Network
2014-07	Achim Voß Mark Schopf	Lobbying over Exhaustible-Resource Extraction
2014-06	Eugen Dimant	The Nature of Corruption – An Interdisciplinary Perspective
2014-05	Natasa Bilkic Thomas Gries	Uncertainty and Conflict Decision
2014-04	Thomas Gries Natasa Bilkic	Investment under Threat of Disaster
2014-03	Natasa Bilkic Thomas Gries	Destructive Agents, Finance Firms and Systemic Risk
2014-02	Thomas Gries Margarete Redlin	Maritime Piracy: Socio-Economic, Political, and Institutional Determinants
2014-01	Ana Mauleon Nils Roehl Vincent Vannetelbosch	Constitutions and Social Networks
2013-16	Nils Roehl	Two-Stage Allocation Rules
2013-15	Zhichao Guo Yuanhua Feng Thomas Gries	Changes of China's agri-food exports to Germany caused by its accession to WTO and the 2008 financial crisis
2013-14	Eugen Dimant Tim Krieger Margarete Redlin	A Crook is a Crook ... But is He Still a Crook Abroad? - On the Effect of Immigration on Destination-Country Corruption
2013-13	Republished as CIE Working Paper 2014-06	
2013-12	Yuanhua Feng Lixin Sun	A Semi-APARCH approach for comparing long-term and short-term risk in Chinese financial market and in mature financial markets
2013-11	Joe Cox Daniel Kaimann	The Signaling Effect of Critics - Evidence from a Market for Experience Goods
2013-10	Eugen Dimant Tim Krieger Daniel Meierriecks	The Effect of Corruption on Migration, 1985-2000 <i>[Published in Applied Economics Letters 20(13), 2013]</i>
2013-09	Yuanhua Feng Sarah Forstinger Christian Peitz	On the iterative plug-in algorithm for estimating diurnal patterns of financial trade durations