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WORKING PAPER

The impact of training on firm performance: Case of Vietnam[1]

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October 2008

2008/538

[1] Paper has been accepted for presentation at the 7th International Conference of the Academy of Human Resource Development (Asia Chapter), to be held in Bangkok, Thailand, from November 3-6, 2008. We would like to thank the reviewers for useful comments and suggestions.

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D/2008/7012/47

The impact of training on firm performance: case of Vietnam.

Abstract: This study uses data from the Vietnam Employer survey to measure the impact of training programs on firm performance. From the survey of 196 companies, the major findings indicate that companies that implemented training in 2006 have increased sales and productivity of both manufacturing and non-manufacturing companies in 2006. However, manufacturing companies that implemented training programs after 2005 lead to an increase of 9 percent in total sales and 9.1 percent in productivity per year between 2005 and 2006 but has no statistically significant effect on 2005-2006 percent change in sales and productivity of non-manufacturing companies if these companies provided training after 2005

Keywords: Training; sales; productivity; firm performance.

Introduction

Human resource academics and professionals together have identified training policies that are critical a condition to improve employee's skills, firm performance, organizational survival (Schuler 1995) and considered essential for a firm to remain competitive (Barney 1991; MacDuffie 1995; Salas & Cannon-Bowers, 2001). Thus, the training and its impact on firm performance is an important topic in the fields of human resource management and industrial relations. A number of authors have attempted to estimate the relationship between training programs and productivity using firm-level data (Bishop 1991; Bartel 1994; Tan & Batra 1995; Arthur, Bennett, Edens & Bell 2003; Aragon-Sanchez, Barba-Aragon & Sanz-Valle 2003; Garcia 2005; and Zwick 2006). Bishop (1991) using the data from the Employment Opportunities Pilot Projects (EOPP) Survey and subjective measure method to link training and productivity whereas Bartel (1994) using standard Cobb-Douglas production function and firm level data from several economic sectors to estimate the impact of training on firm productivity.

In light of the international attention on the relationship between training and firm performance, it is disturbing that the study on this topic is so limited in Vietnamese context. In this paper, we use the data from 2007 Vietnam Employer Survey and Cobb-Douglas production function to estimate the impact of training on firm productivity in Vietnam. Our approach to the study is facilitated by using a data that contains information on the value of sales, receipts or shipments, the book values of capital stock, the cost of materials used in production during calendar years 2005 and 2006, the number of labor, employee training costs, and other related information.

In an attempt to contribute to this research field, we provide a skim of literature on the effect of training on firm productivity in the second section. The brief on the current training situation in Vietnam and research design are provided in the third and fourth section. Data

collection and estimation framework that are used for estimation framework are described in the fifth and sixth section. Results and discussions are present in the seventh section and last section is conclusions.

Literature Review

Human capital resources include knowledge, skills, experience, etc controlled by a firm that enables the firm to improve its performance, competitiveness, innovation, efficiency and effectiveness (Daft, 1983; Martocchio & Baldwin, 1997; Lawler & Ledford, 1998; Bassi & McMurrer 1998). The belief that employer-provided training has an impact on firm productivity has been prevalent among academics for many years. Some of the studies (Barron et al. 1994 and Bishop 1994) have looked at the relationship between training and productivity by using a subjective measure method of productivity. They estimated the impact of training in the first three months of employment on firm productivity using data from 1982 Employment Opportunity Pilot Project (EOPP) survey with 659 companies. The survey included information on formal and informal training, duration and intensity of training, wages, and productivity. Barron et al (1994) found that 10% increase in training increases productivity by 3.7%. Besides data from EOPP survey, Bishop (1994) also used other data set from National Federation of Independent Businesses (NFIB) survey to estimate the impact of training on firm productivity. The NFIB survey has a larger sample of companies (2,599 companies) than the EOPP survey. However, the two surveys have similar contents and focus on the most new hires**.** The estimating results from NFIB survey by Bishop concluded that formal training has no initial effect on anything but it increases current productivity by 15.9 percent.

Another measure method approach (Holzer, Block, Cheatham & Knott 1993; Bartel 1994; Black & Lynch 1996a; and Boon &Van der Eijken 1998) is to use a firm level dataset to estimate the impact of training on productivity. Holzer et al. (1993), using data from

Michigan Job Opportunity Bank-Upgrade program between 1988 and 1989, estimated the effect of total hours of training in the product scrap rate. They collected data on total hours of training and companies' outcomes. They found that training has positive effects on the quality of output. In addition, training has little effect within the first few years on sales, but positive and marginally significant effects on short-term employment changes. Bartel (1994) uses data on the training policies and economic characteristics of firms in the Columbia Business School survey to measure the impact of formal training programs on labor productivity. The survey contained information on training activities, number of employees and output in 1983 and 1986. The major findings of this study is that firms that were operating below their labor productivity in 1983 and implemented training programs after 1983 had significant productivity gains during the 1983-1986 period. Bartel (1994) also found that training investment increased productivity by about 16 percent. Black & Lynch (1996a) looked at the relationship between training and productivity using final samples of 2,945 firms from the National Center on the Educational Quality of the Workforce's National Employer Survey (EQW-NES). The survey was designed to collect company information about the value of sales, receipts, or shipment; the book value of capital stock; and the cost of materials used in production during calendar year 1993. They used a Cobb-Douglas production function in their estimation and found that a 10 percent increase in average education will lead to a 8.5 percent in manufacturing productivity and a 12.7 percent increase in non-manufacturing productivity.

Although training plays an important role in a firm's skill provision, it also creates a sustainable competitive advantage, and improves productivity for the firm, even though some studies on productivity effects of training had contrary results. Using general and specific training for their studies, Barrett & O'Connell (2001) found that the specific training had no significant effect on productivity growth and Loewenstein & Spletzer (1999) failed to demonstrate the impact of general training on firm productivity. Schonewille (2001) found

that the general and specific training has statistically insignificant effect on productivity. Ng & Siu (2004) estimated the impact of training on firm performance in China by types of training (technical training and managerial training) and they found that technical training had no impact on productivity.

The above summary literature implies that training is does not always improve or impact on firm productivity. In addition, there is a lack of study to estimate the impact of employer-provided training on firm performance in Vietnam. Therefore, our following study was not only providing an estimate specific case but also a timely supplementation in the literature.

The current training situation in Vietnam

After more than 20 years of economic reforms, Vietnam's economy has made important achievements in growing industrial output and services. The number of private and foreign companies has increased very quickly and attracted a large amount of labor. In addition, Vietnam has been a member of the World Trade Organization since November 2006 and hence there is expected to be a surge in foreign direct investment and international trade, which will undoubtedly lead to higher growth in labour demand. Therefore, the Vietnamese government has identified education as a foremost national policy because highly qualified human resources are considered one of the important driving forces to accelerate the industrialization and modernization process and play the basic issue for social development and rapid, sustainable economic growth (MPI, 2001). Many state-funded projects have been launched for human resource training such as a five-day training course offering information about laws and policies, production strategies, and how to set up a company (Judge & Levine, 1997); a seven-day course focusing on improving human resource management, marketing, finances and technology skills (World Bank, 1997); or a 14-day course training business people in consulting and marketing (Gross & Weintraub, 2005).

On the other hand, state-owned and private enterprises have begun to design many training programs for their companies. The first group comprises state-owned enterprises, which provide training for 96 per cent of incumbent employees and 62 per cent of new employees (Quang & Dung, 1998). Through training, employees will upgrade their technical and problem-solving skills, and some training courses motivate working spirit and improve behavior of employees. The second group contains joint-venture companies and foreign-owned companies, which tend to provide more training for employees than is provided by state-owned enterprises. The companies in this group often seek collaboration with education institutions or consultancy companies to organize short courses for their employees (Quang, 1997). The training provided concentrates more on behavioral, technical and professional skills. The third group (Thang & Quang, 2007) comprises small and medium-sized enterprises. They seldom have formal human resources departments and training investment. Hence, training activities are generally implemented by education institutions or consultancy companies. Vietnamese government plays an important role in training skilled workforce for these enterprises.

Research Design

The Vietnam Employer survey was designed and administered by an individual group of researchers in Ghent University in a mail survey in July and August of 2007 to Vietnam nationally representative sample of companies with more than 50 employees. The focus of the questionnaire was on firm characteristics (total value of revenues, sales, or receipts; total value of capital or the cost of goods and materials used in production), use of education and training investments (types of training programs, total cost of training programs, reasons for establishment training, sources of trainers, government grants or subsidies for training), employment and work organization (the number of employees, benchmarking programs, Total Quality Management program, flexitime, company strategies). This was the first survey

of workplace practices for collecting information that allowed us to estimate the impact of training and other factors on firm productivity in Vietnam.

The main focus of our research was in the intersection between employers' practices and human capital in those companies. Therefore, we could not choose small companies because they could not provide enough information for our questionnaire such as value of sales, book value of the fixed capital stock, cost of goods and service, human resource training policies, or work organization characteristics. Other small companies did not maintain a separate line item for training in the budget, or they were not sure about expenditures data for the training costs. Therefore, we decided to concentrate on the firms with more than 50 employees. Although the survey excluded firms with less than 50 employees (which represent about 84 percent of all in Vietnam), the sample represents about 80 percent of all workers. Non governmental and non profit organizations, public administrative organizations, and corporate headquarters were not included in the sample.

Data Collection

In the case of Vietnam, the survey had a sampling frame that included both the manufacturing (food and tobacco, textile and apparel, lumber and paper, printing and publishing, chemicals and petroleum, primary metal, machinery and computer, electrical machinery, and miscellaneous manufacturing) and non-manufacturing firms (construction, transportation service, communication, wholesale trade, finance and banking, insurance, hotels, business services) in July and August of 2007. A nationally representative sample of 1,000 companies with more than 50 employees was drawn from several industries by using the 2007 Telephone Directory of Vietnam.

The initial contacts for this study were the general managers of the companies or business units at each site. We mailed each company a cover letter and questionnaire measuring firm characteristics, training activities, and work organization, but insufficient and non-

respondents were eventually contacted by telephone. A final total of 202 of companies participated in the study. Hence the response rate based on the 1,000 companies was 20.2 percent. Appendix table 1 presents the distribution of the sample by industry. After using SPSS and E-View econometric software for estimate the data, there were 196 companies that gave information necessary to code all of the variables required for this study, 6 companies were eliminated because of incomplete required data. Summary statistics of major companies' data of the survey are show in appendix table 2.

The variables

The purpose of this survey was to collect information on a broad range of firm characteristics, training activities, training costs, reasons of training, source of training provider, kind of training, employment and work organization. The survey did not ask for information on the amount of time employees spent on the training program. Therefore, T stands for the information regarding to the training costs of the company each year. The data collected for the training variable included in a question relating to cost of training. For each questionnaire in the survey, output Y is measured by the Vietnam Dong (VND) of sales, receipts, or shipments and K is measured by fixed capital stock of the company at the end calendar year. Reported labor (RL) is measured as the number of employees in the companies.

There are several independent variables for equation all the equations. First, the independent variable is the 2006 book value of the capital for the calendar year of the company i. Second, independent variable is the 2006 reported labor. Reported labor is measured by the number of employees at the end of calendar year 2006. Third, training variable is measured by the training cost divided cost of goods and services used in the production of company sales, receipts, or shipments. Fourth, the dummy variables are included for all equations. A dummy variable is measure of the percentage of the full-time workforce that has been employed at the company for less than one year; other dummy variables are needed in the analyzing process

such as use of benchmarking, Total Quality Management, or flexible time in the company. Table 1 summarizes the dependent and independent variables of our study.

Table 1: Summary Statistics of Principal Variables

Dependent variables:

Log of productivity 2006 (ln(Y/RL))

Log of sales 2006 (lnY)

2005-2006 percent change in productivity (dln(Y/RL))

2005-2006 percent change in sales (dlnY)

Independents variables:

Log of capital 2006,

Log of reported labor 2006,

Training

% Workers < 1 year

Benchmark

Total Quality Management

Flexitime

The Estimation Framework

Analogous to the previous studies, we assume the production function to be adequately described by a Cobb-Douglas specification. Output Y of company is a function of two inputs, capital K and "effective labor" EL. The production function can be written as:

$$Y = A * K^{\beta} * EL^{\gamma} \qquad (1)$$

Where A is an efficiency parameter, β and γ are numbers greater than zero. Effective labor is weighted of the number of trained employees and presented in the following equation:

$$EL = RL * (1+\lambda T) \qquad (2)$$

Reported labor (RL) is the amount of labor employed; T is the proportion of trained employees in a company, λ is negative parameter. Within this framework, effective labor (EL) equals reported labor, if the company has no training program and EL exceeds RL with increases in the value of training programs. In the case of Vietnam, this study replaces it by

the proportion between the training cost and total costs of the company. Substituting equation (2) into equation (1), we can be rewritten equation (1) as:

$$Y = A_{*}K^{\beta}{}_{*}[RL_{*}(1 + \lambda T)]^{\gamma} \qquad (3)$$

If log-transform model (3), we obtain:

$$Ln(Y) = lnA + \beta lnK + \gamma\, lnRL + \gamma\lambda T + \alpha X + \varepsilon \qquad (3^{*})$$

The model (3*) is linear in the parameters ln A, β, and γ and is therefore a linear regression model. It is nonlinear in the variables Y, K, RL, or T but linear in the logs of these variables.

We divide equation (3) through reported labor and take logarithm of both sides, using Taylor expansion to term ln (1+ λT) at close zero (ln (1+ λT) ≈ λT) and adding a vector of control variables, X. The vector X includes dummy variables for specific types of training activities, the number of the full-time employees that has been employed at the company for less than one year, dummy variables for the use of TQM or benchmarking, a dummy variable equal to one if there is a research centre in the company. We get following function:

$$Ln(Y/RL) = lnA + \beta lnK + (\gamma\text{-}1)\, lnRL + \gamma\lambda T + \alpha X$$

The model econometrics to estimate the parameters is:

$$Ln(Y/RL) = lnA + \beta lnK + (\gamma\text{-}1)\, lnRL + \gamma\lambda T + \alpha X + \varepsilon \qquad (4)$$

The equation (4) presents a model of productivity in which we will estimate the impact of training on productivity.

However, there are many factors relevant to company productivity beside capital, labor and training factors. Thus, in order to avoid omitted variable bias and to eliminate unobserved heterogeneity in productivity levels, we used the deferent equation of the model (3*) and (4). We have following models to estimate the parameter change of sales and productivity:

$$dLn(Y) = a + \beta dlnK_i + \gamma\, dlnRL_i + \gamma\, \lambda dT_i + w_i \qquad (5)$$

$$dLn(Y/RL_i) = \beta dlnK_i + (\gamma\text{-}1)\, dlnRL_i + \gamma\, \lambda dT_i + w_i \qquad (5^{*})$$

A change in training provided previously may be related to a change in productivity in the near future. Hence, the other advantage of equation (4) is forecasting whether training provided in 2005 brought firm productivity growth between 2005 and 2006.

Results and discussions

Before estimating the equation (3*) and (4), we will present some descriptive statistics on the major variables of the companies in table 1. Dependent variables includes log of productivity 2006 (ln(Y/RL) and log Sales (ln(Y)). According to the framework, company increase in training might lead to increase in sales but not increase in productivity because productivity (Y/RL) depends on both sales and reported labor. There are a number of studies (Bartel, 1994; Tan & Batra, 1995; Black & Lynch, 1996; Ng & Siu, 2004) estimated the impact of training on firm output data (sales) while other studies (Bartel, 1994; Tan & Batra, 1995; and Zwick, 2006) investigated the impact of training on firm productivity (sales/number of employees). Therefore, we chose to estimate both dependents because we would like to provide for readers the full picture about the relationship between employee's training and firm performance (including sales and productivity).

We use all above variables in table 1 for estimating the equations (3*) and (4). However, some variables were statistically insignificant to the result of estimation at acceptable level and some other variables could cause multicollinearity. Thus, according to the statistic and econometrics rules, in our sales and productivity estimation models, we drop these variables by a backward elimination procedure in which initially a large model is hypothesized and systematically non-significant variables are eliminated one by one (Damodar, 1995) and the last results of regression in table 2 and table 3. All remaining variables are now highly significant.

In table 2, we present the results of estimating equation (4) using 2006 Labor productivity as the dependent variable. In row 7 of table 2, the training variable has significant impact on

productivity of both manufacturing and non-manufacturing companies. A 1 percent increase in training cost induced a 1 percent increase in productivity in a manufacturing company and 0.73 percent increase in a non-manufacturing company. Interestingly, in column 2 of the table 2, the training of a manufacturing company not only effects productivity of that company but also has the largest significant impact on productivity compared with capital variable (0.52 percent) and reported labor variable (0.62 percent). It could be argued that training plays an important role in improving productivity of a manufacturing company. This result may shed some light on the widening skill and skill shortage employee gap that occurs in developing countries.

Table 2: Dependent variable: Log (Productivity 2006) (T-values in parentheses)

Model: $Ln(Y/RL) = lnA + \beta lnK + (\gamma\text{-}1)\, lnRL + \gamma\lambda T + \alpha X + \varepsilon$ (4)

Independent variable	***Dependent variable*** Log (Y/RL)	
	Manufacturing	**Non-Manufacturing**
Constant	7.031	10.714
	(9.489)**	(6.826)**
Capital 2006	0.521	0.155
	(11.471)**	(0.527)
Reported labor 2006	-0.618	-0.522
	(-9.983)**	(-0.453)
Training	-1.004	-.734
	(-6.268)**	(-3.118)**
Benchmark	-0.033	-0.593
	(-0.274)	(-1.736)*
Flexible time	-0.157	1.518
	(-0.394)	(2.295)**
N =	155	41
Adjusted R2	0.631	0.473

Note: T-tests are given in parentheses.
*Significance at the 10% level.
**Significance at the 5% level.

In column 2 of the table 2, the capital variable and reported labor variable has an insignificant impact on productivity of a non-manufacturing company. The other important finding is that the benchmarking program and flexible time dummy variable of four dummy variables has significant impact on productivity of a non-manufacturing company with 0.6 percent and 1.5 percent respectively. The flexible time has high significant impact on productivity of non-manufacturing companies because an expanded flexible time program will be increased autonomy and responsibility for employees that may increase employee job satisfaction and productivity. In addition, in order to satisfy the needs of customer, flexible time program have been applied in almost all companies in the service sector in Vietnam.

As discussed in the first paragraph of this section, at the same time using a model to estimate 2006 productivity of the company in the survey, an other model (equation 3*) of the determinant of 2006 Sales is estimated in which the dependent variable is the sales of the company in the sample and the independent variables are the summary statistics of principal variables in table 1. The results of the equation (3*) estimation using 2006 sales as the dependent variable are shown in table 3. Training variable is an important determinant of company sales and has significant effect in both the manufacturing and non-manufacturing sectors. The estimated coefficient in the Cobb-Douglas model indicate that a 1 percent increase in training in the company will lead to a 1 percent increase in sales in manufacturing and a 0.72 percent in non-manufacturing companies. The results show a similar range of estimates found by Black and Lynch (1996) in their investigation of establishment on the Educational Quality of the Workforce National Employers' Survey.

Row 5 of table 3 shows that the number of labor variable has positive impacts on sales of both manufacturing and non-manufacturing companies by 0.38 percent and 1.37 percent respectively. One possible explanation of why the number of labor has high significant effect on sales of non-manufacturing companies is that there are 35 construction companies on total

69 non-manufacturing companies of the survey sample while construction sector is a labor-intensive industry with a strong reliance on specialized skills. The results are true compared with the theoretical and empirical research on characteristics of non-manufacturing establishments.

Other interesting results in table 3 include the positive and rather large significant effect that benchmarking program, and flexitime variables have on sales of non-manufacturing companies. However, the variables have no significant impact on sales of manufacturing companies. Combining the estimated results of the table 3, we can be conclude that numbers of labor in manufacturing companies had relatively less effect on sales compared with non-manufacturing companies while the training variable in non-manufacturing companies had less effect on sales compared to manufacturing companies in the survey.

Table 3: Dependent variable: Log (Sale 2006) (T-values in parentheses)

Model: $Ln(Y) = lnA + \beta lnK + \gamma\ lnRL + \gamma\lambda T + \alpha X + \varepsilon$ (3*)

	Dependent variable Log (Y)	
Independent variable	**Manufacturing**	**Non-Manufacturing**
Constant	7.031	9.485
	(9.489)**	(4.866)**
Capital 2006	0.521	0.502
	(11.471)**	(5.241)
Reported labor 2006	0.382	1.371
	(6.168)**	(3.916)**
Training	-1.004	-.724
	(-6.268)**	(-3.079)**
Benchmark	-0.109	-.584
	(-1.866)	(1.710)*
Flexible time	0.037	1.355
	(0.195)	(1.998)*
N =	155	41
Adjusted R2	0.75	0.681

Note: T-tests are given in parentheses.
*Significance at the 10% level.
**Significance at the 5% level.

The next step in the analysis is to consider whether the implementation of these training programs led to significant increases in productivity and sales after 2005. We use equation (5) and (5*) to estimate changes of labor productivity and sales of the company. In order to estimate equation (5) and (5*), information related of the companies in year 2005 is needed and results are shown in table 4 and 5.

Table 4: Dependent variable: 2005-2006 Percent change in sales (T-values in parentheses)

Model: $dLn(Y) = a + \beta dlnK_i + \gamma\, dlnRL_i + \gamma\, \lambda dT_i + w_i$ (5)

	Dependent variable = dln(Y)	
Independent variable	**Manufacturing**	**Non-Manufacturing**
Constant	0.283	1.518
	(3.314)**	(3.338)**
Capital 2006	0.242	.657
	(3.438)**	(7.245)**
Reported labor 2006	-0.618	-0.522
	(-9.983)**	(-0.453)
Training	-0.899	-0.033
	(-5.094)**	(-2.006)
Benchmark	-0.125	-.635
	(-2.411)**	(-2.928)**
% Workers < 1 year	0.005	-.014
	(2.015)**	(-1.821)*
N =	155	41
Adjusted R2	0.231	0.624

Note: T-tests are given in parentheses.
*Significance at the 10% level.
**Significance at the 5% level.

In table 4, the estimated coefficient on training is significant in the manufacturing company group, indicating that companies that implemented training programs after 2005 will have an increase of 9 percent total sales per year between 2005 and 2006. We find that training has no statistically significant effect on 2005-2006 percent change in sales of non-manufacturing companies. According to equation (2), we can argue that the companies that implemented training after 2005 reduced the size of their workforces and each worker would be performing more tasks more efficiently. This would have created an increase in output per worker. However, the companies in the sample that implemented training program after 2005 actually raised the size of their workforce between 2005 and 2006 (data collected from question 20 on size of workforce) in the survey. Therefore, we could conclude that the argument is rejected by the data.

Row 7, table 4 reports results for the impact of number of employees of less than 1 year on 2005-2006 percent change in sales in both manufacturing and non-manufacturing companies. There are two possible explanations of why the variable had an impact on sales. First, newly hired employees with no relevant work experience required more time and cost to train them. Second, these companies might pay quite a high cost for turnover rate in terms of lower sales because many of those trained employees have moved on to other firms where the firm specific components of training yield no benefits or their wages did increase after training.

Equation (5*) is used to consider whether the companies that implemented training programs led to increased productivity of these companies after 2005 and the results are shown in table 5. Similar with the results in table 4, training has a significant effect on 2005-2006 percent change in productivity of manufacturing companies (9.1 percent productivity per year in 2005-2006 stage) but has no statistically significant effect on 2005-2006 percent change in productivity of non-manufacturing companies. However, reported labor variable has an effect on the 2005-2006 percent change in productivity of manufacturing companies(9 percent

productivity per year in 2005-2006 stage) and flexible time variable has an effect on 2005-2006 percent change in productivity of non-manufacturing companies(5.1 percent productivity per year in 2005-2006 stage).

Table 5: Dependent variable: 2005-2006 Percent change in labor productivity(T-values in parentheses)

Model: $dLn(Y/RL_t) = a + \beta dlnK_t + (\gamma\text{-}1)\, dlnRL_t + \gamma\, \lambda dT_i + w_i$ (5*)

	Dependent variable = dln(Y/RL)	
Independent variable	**Manufacturing**	**Non-Manufacturing**
Constant	0.283	1.29
	(3.307)**	(2.895)**
Capital 2006	0.241	0.632
	(3.432)**	(7.114)**
Reported labor 2006	-0.894	0.965
	(-7.162)**	(0.750)
Training	-0.906	0.014
	(-5.123)**	(0.052)
Benchmark	-0.128	-0.164
	(1.766)*	-1.095
% Workers < 1 year	0.005	-0.026
	(1.766)*	(-3.433)**
Flexible time	0.037	-0.509
	0.195	(-2.397)**
N =	155	41
Adjusted R2	0.395	0.61

Note: T-tests are given in parentheses.
*Significance at the 10% level.
**Significance at the 5% level.

VIII. Conclusion

The Vietnam Employer survey of companies shows clearly that most employers in the Vietnam provide some type of training for their employees, although there is a variation by company size and industry. It means that employers believe that training frequently improves

employees' skills and boosts their motivation. This, in turn, leads to higher productivity and profits. The training costs are relative to the number of workers in the company. The large employee sized companies are more likely to provide training programs than small sized companies. The decision of training investments by employers also differs according to their group of employees, skills of newly hired employees, timing, and location. As in other countries, medium-sized companies in Vietnam are less likely to offer computer, teamwork, or basic education training. In addition, as outsourcing of training increases, much of the training provided will be by consultants outside these companies.

The study has used company-level data to examine impact of employee training and firm performance in Vietnam. The major findings indicate that companies that increased training in 2006 lead to significant increases in sales and productivity of manufacturing and non-manufacturing companies in 2006. However, manufacturing companies that implemented training programs after 2005 had lead to an increase of 9 percent in total sales and 9.1 percent in productivity per year between 2005 and 2006 but had no statistically significant effect on 2005-2006 percent change in sales and productivity of non-manufacturing companies if these companies provided training after 2005. The findings mean that a relationship between training and firm performance exists, not only at the level of the individual employee, as demonstrated in previous studies, but also at company level. The results also suggest that non-manufacturing companies need to concentrate on a benchmarking program and flexible time beside training programs.

Our study was designed to overcome several limitations of previous studies using subjective estimates of productivity and sales and collects more data on firm characteristics, education and training characteristics, and employment and work organization characteristics. However, we only estimated effects of training on productivity and sales. Therefore, first, we suggest that future research needs to analyze the various dimensions of employee training programs,

e.g. formal and informal employee training, the type of training methods and design, the type of employees trained, and time spent by employees in training. Second, we have estimated the impact of training on sales and productivity. Therefore, there is an opportunity for future research to estimate the impact of training on other non financial firm performance. Third, the effects of training on firm performance of each sector (e.g., textile and apparel, lumber and paper, chemicals and petroleum, construction industry, finance and banking, insurance, hotels, business services) may vary differently. Thus, more studies on the relationship between training and firm performance for specific sectors is needed. Fourth, it is important to examine how organizational strategies moderate the relationship between human resource training and firm performance. Finally, the international comparison of relationship between training and firm performance is required in order to provide the interesting picture in human capital investment.

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Appendix

Table 1: Distribution of Sample by Industry

Industry	Frequency	Percent	Cumulative Percent
Manufacturing			
Food and Tobacco	22	10.9	10.9
Textile and Apparel	7	3.5	14.4
Lumber and Paper	17	8.4	22.8
Printing and Publishing	7	3.5	26.2
Chemicals and Petroleum	15	7.4	33.7
Primary Metals	5	2.5	36.1
Fabricated Metals	32	15.8	52.0
Machinery & Computers, Electrical	14	6.9	58.9
Machinery, and Instruments	4	2.0	60.9
Transportation Equipment	3	1.5	62.4
Miscellaneous Manufacturing	7	3.5	65.8
Non-Manufacturing			
Construction	35	17.3	83.2
Transportation Services	6	3.0	86.1
Communication	5	2.5	88.6
Utilities	5	2.5	91.1
Wholesale Trade	6	3.0	94.1
Retail Trade	3	1.5	95.5
Finance	6	3.0	98.5
Insurance	1	.5	99.0
Hotels	2	1.0	100.0
Total	202	100.0	

Table 2: Summary Statistics of major companies' data of the survey

Summary Statistics of major companies data of the survey							
	Unit	Activity				Total	
		Manufacturing		**Non-Manufacturing**			
		Mean	S.D	Mean	S.D	Mean	S.D
Sales, receipts or shipments 2005	mill VND	267803	412254	294537	421644	273229	413258
Sales, receipts or shipments 2006	mill VND	318725	469491	370718	507460	329278	476599
Book value of capital stock 2005	mill VND	284413	894252	194793	294966	266041	808537
Book value of capital stock 2006	mill VND	327409	900042	271667	381406	315982	820320
Total cost of good and services 2005	mill VND	245784	357409	279547	408147	252637	367452
Total cost of good and services 2006	mill VND	272439	390670	351583	497282	288503	414392
Total labor force 2005	Person	599	638	278	296	534	599
Total labor force 2006	Person	776	1799	307	315	681	1622
Total training cost 2005	mill VND	235	285	191	383	226	307
Total training cost 2006	mill VND	279	341	294	484	282	373
Total training cost 2005/ Total labor force 2005	VND/per	455	538	582	706	481	577
Total training cost 2006/ Total labor force 2006	VND/per	482	464	898	1142	567	679
Total training cost 2005/ Total cost of good and services 2005	%	0.23	.33	.19	.26	.22	.32
Total training cost 2006/ Total cost of good and services 2006	%	.24	.35	.32	.60	.25	.41
Percentage of employees proficient at their jobs	Percent	87.33%	12.11%	89.66%	5.22%	87.80%	11.09%

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