

Human resource management practices and firm outcomes: evidence from Vietnam

HRM practices
and firm
outcomes

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Abstract

Purpose – The purpose of this paper is to estimate the effects of human resource management (HRM) practices on firm outcomes at the firm level in Vietnam.

Design/methodology/approach – The paper employs a fixed-effects framework for the estimation using a panel sample of manufacturing firms from small- and medium-sized enterprise surveys between 2009 and 2013.

Findings – The paper finds that, on average, a firm that provides the training for new workers gains roughly 13.7, 10 and 14.9 percent higher in output value per worker, value added per worker and gross profit per worker, respectively, than the counterpart. Moreover, an additional ten-day training duration for new employees on average leads to a 4.1 percent increase in output value per worker, a 3.0 percent rise in value added per worker and a 3.0 percent growth in gross profit per worker. The paper also uncovers that a marginal 10 percent of HRM spending results in about 2 and 1.6 percent rises in output value per worker and value added per worker, respectively.

Originality/value – Using the case of Vietnam, this paper shows the important roles of HRM practices in explaining firm outcomes.

Keywords Vietnam, Human resource management, Firm outcomes

Paper type Research paper

Introduction

Management-related functions inside firm significantly determine firm's growth (Bloom and van Reenen, 2007; Milgrom and Roberts, 1990). Moreover, the theory arguably treats "management as technology" and apparently indicates the positive impact of management on firm performance (Bloom *et al.*, 2016). Among management-related functions, human resource management (HRM) is probably the most fundamental part because it fosters the efficient use of human resources (Bloom and van Reenen, 2011). Feasibly, examining the impacts on firm outcomes of HRM practices is similar to that of the adoption or the diffusion of a new technology. Thus, that whether a firm carries out HRM practices compared to the counterpart is likely an understandable explanation for dispersion in business results across firms[1].

The study of HRM is traditionally the realms of industrial sociology and psychology, which emphasize the functions of institutions and culture as the primary determinants of the organizational structure inside firms. Whereas conventional labor economics only focuses on the study of labor markets such as labor demand, supply, unemployment and investments in education, this subfield of economics roughly ignores HRM-related practices[2] inside organizations and leaves them as "black-boxes."

JEL Classification — M52, M53, M54

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Recent decades have witnessed the development of economic analysis of HRM within organization and the introduction of personnel economics (Bloom and van Reenen, 2011). Personnel economics examines two main problems facing any organization, including how to recruit appropriate candidates for available vacancies, and how to organize work and motivate employees (Lazear and Shaw, 2007; Lazear and Oyer, 2013). This study focuses on the second issue and quantitatively explores the impacts of HRM practices on firm outcomes using Vietnamese small- and medium-sized enterprises (SMEs) data.

Many analogous studies are almost in developed countries such the USA and European countries using econometric analysis. However, there is a lack of studies from developing countries including Vietnam. This study provides firm-level evidence on the empirical literature of HRM practice impacts in Vietnam and developing nations as well.

Vietnam is a transition economy with the transformations from many economic activities including business functions inside organization toward modern international standards. Firms' applications and adoptions of contemporary people management measures especially from the West become a discernible trend in the context of growing globalization of Vietnam's economy (King-Kauanui *et al.*, 2006; Truong and van der Heijden, 2009).

SMEs are dominant and essential subjects within the Vietnamese economy. SMEs amount to about 90 percent in 2000–2008, and even 97 percent in 2008 of the total enterprises in Vietnam (Vu *et al.*, 2016). Moreover, SMEs play considerable roles in the economy (Hung, 2007; Trung *et al.*, 2009; Kokko and Sjöholm, 2005). For instance, SMEs account for approximately 40 percent of GDP and 32 percent of the total investment in 2006 (Hung, 2007). In addition, SMEs generate about 2.5m new jobs in 2005 (Trung *et al.*, 2009), and it was also the main driver for poverty reduction in rural Vietnam (Kokko and Sjöholm, 2005). Given SMEs' contributions, understanding management-related practices including HRM actions of SMEs, therefore, provides more efficient evidence-based policies for the pro-growth and the pro-poor strategies in Vietnam.

Research on the effect of HRM practices on firm outcomes for SMEs is important for several reasons. First, evidence on the HRM role in SMEs is a literature gap from the developing countries because most existing studies focus on the large-sized organizations in developed countries (Ogunyomi and Bruning, 2016). Second, SMEs account for a large share of total business and become main drivers for economic growth especially in developing nations (Cardon and Stevens, 2004). In addition, SMEs account for the remarkable population of companies and become the significant force for economic growth in the developing countries. Furthermore, various HRM practices likely produce various impacts on firm outcomes (Bloom and van Reenen, 2011).

In this study, we test whether there are differences in the effects of some HRM practices that include training (measured by binary and training days), incentive measure and per capita HRM spending. Existing research on HRM is almost qualitative studies in Vietnam. However, such studies are arduous to sufficiently reveal the importance of HRM practices. Hence, quantifying the effect of HRM practices on firm outcomes is more momentous for evidently discerning the role of HRM practices. Providing quantitative evidence is this study's main motivation.

Literature review

The existing literature detects that HRM practices have significant effects on firm outcomes such as productivity, performance or innovation. Cooke (1994) provides evidence for the positive effects of HRM practices on firm outcomes in Michigan, the USA. Specifically, the application of employee participation and group incentives raise value added. Lazear (2000) finds that there is an increase of 22 percent in productivity stemming from a change in the payment method from flat hourly wage to per windshield piece rate pay for American firms.

Black and Lynch (2001) find that the labor productivity for American non-manager employees is remarkably and positively associated with the profit-sharing strategy – an incentive measure, and the correlation is even stronger for those from union enterprises. Bartel *et al.* (2007) reveal that HRM practices including team working, incentive pay and training result in increases in new IT technology applications into the manufacturing activities in the USA.

Lavy (2009) discovers a strong and positive association between teacher performance and bonus award based on pupils' examination pass rates and scores. Bloom *et al.* (2012) show that the people management score (including multiple strategies such as careful hiring, performance pay, merit-based promotion, fixing/firing) as a proxy for the HRM measure accounts for higher IT productivity in Europe. Messersmith and Guthrie (2010) show that the use of high-performance work system is positively related to sales growth, product and innovation for infant high-tech companies in the USA.

However, the result of positive or negative impacts of HRM practices admittedly depends on the proxy choices for firm outcomes and even the data used. For instance, Freeman and Kleiner (2005) discover that the termination of piece rates reduces productivity but engenders a positive impact on firm profit. In addition, while studies using cross-sectional data robustly are suggestive of positive impacts on firm productivity of HRM practices, studies using time-series data likely yield opposite findings (Ichniowski *et al.*, 1997).

For research on the HRM role of SMEs from developing countries, Ogunyomi and Bruning (2016) find that, on average, a firm using HRM practices, respectively, have 12 and 16 percent of financial and non-financial performances larger than that of the counterpart in Nigeria.

King-Kauanui *et al.* (2006) conduct the first study on the effects of HRM practices on firm performance in Vietnam and find that training, performance appraisal systems and incentive pay are positively linked to firm performance. Notably, incentive pay generates the highest impact. Although this study focuses on SMEs, it only has a small sample of firms in Ha Noi at one year. In contrast, we use a large sample of firms in ten provinces of Vietnam in many years. Such sample allows us to investigate a more comprehensive impact of HRM practices on firm outcomes.

Estimation methods

In estimating the effects of an HRM practice on firm outcome, researchers face a potential problem that the possible existence of some determinants which simultaneously affect both HRM practices and firm outcomes. In other words, there potentially exists an endogeneity problem that highly produces bias estimates using ordinary least squares estimation procedure. For instance, a firm that has good businesses is more likely to spend sufficient resources for its HRM practices. Therefore, it is important to control unobservable or omitted factors such as latent firm-level characteristics that might jointly determine both HRM practices and firm consequences.

In a standard manner, researchers commonly use an instrumental variable (IV) approach to address this challenge. Notwithstanding, identifying a satisfactory IV that fulfils requirements including: having an exclusion restriction, being uncorrelated with other omitted variables and having an ample strength is probably a challenging task. Given this difficulty, we arguably employ a fixed-effects framework to control latent factors and estimate the impacts of HRM practices on firm outcomes.

Moreover, using a panel sample of manufacturing firms from Vietnamese SMEs between 2009 and 2013 enables us to apply fixed-effects model for the estimation. Also, we can regard 2009–2013 as a short period so that we possibly treat undiscovered characteristics at firm-level as time-invariant factors. It is, therefore, another rationale for our usage of fixed-effects model as an identification strategy in this study.

In the full econometric model, we specifically add dummy variables for province and year and province-year interactive terms to restrain determinants that probably change at these various levels over years between 2009 and 2013. The regression equation is as follows:

$$Y_{ijt} = \alpha + \beta HRM_{ijt} + \gamma_i + \delta_j + \tau_t + \eta_{jt} + \varphi X_{ijt} + \varepsilon_{ijt}, \quad (1)$$

where Y_{ijt} is a measure of an outcome for a firm i , in a province j and a year t . There are three key proxies for Y_{ijt} employed in this study including: output value per worker, value added per worker and gross profit per worker[3]. The components γ_i , δ_j , τ_t and η_{jt} , respectively, correspond to firm, province, year and province by year fixed effects indications; and ε_{ijt} is an idiosyncratic error term.

X_{ijt} is a vector of control variables for firm and province characteristics in the main specification. Specifically, control variables for firm characteristics include firm size, ownership structure, whether the firm has informal status, whether the firm is exporting firm, and whether the firm is inspected, and a control for province characteristics is the provincial competitiveness index (PCI)[4]. In the section of robustness checks, we add more control variables for manager characteristics including education, whether the manager's main income source is only from the firm, whether the manager is a veteran and whether the manager is a party member. Importantly, we add control variables in the model to resolve a potential threat to our identification, namely, other factors that are correlated with HRM practices supposedly associated with firm outcomes.

Next, HRM_{ijt} denotes an HRM practice that is employed by a firm i , in a province j and at a year t . HRM practice variables include a wide range of HRM activities that were implemented by a firm over the last year. In particular, the HRM practices are whether the firm provided the training for its new employees, the days of training, whether the firm employs incentive measures consisting of additional payments and fringe benefits as a main method for managing employees and per capita HRM spending.

The parameter of interest is the coefficient β , which presents the reliable effect of an HRM practice on an outcome of the firm under the assumption of strict exogeneity conditioned on the fixed effects estimation. Standard errors are clustered at the province level to conduct the statistical inference robust to heteroskedasticity and serial correlation within provinces over time.

Data and the sample

The data source of this study is from SMEs surveys. SMEs surveys are jointly carried out for every two years by University of Copenhagen, General Statistics Office of Vietnam, Vietnamese Institute of Labor Science and Social Affairs and Central Institute for Economic Management of Vietnamese Ministry of Investment and Planning. The first wave of SMEs survey is in 2002. The aim of SMEs surveys is to elicit various information of a firm including its general information, history, household characteristics of the respondent that is the manager or the owner of the firm, the characteristics of production activities and technology used by the firm, the structure of sales, indirect costs, raw materials and services, aspects related to investments, assets, liabilities and credit, fees, taxes and informal costs, employment and environment.

The sample for each wave of survey includes about 2,600 non-state-owned manufacturing firms located in ten Vietnamese provinces including Ha Noi, Phu Tho, Ha Tay[5], Hai Phong, Nghe An, Quang Nam, Khanh Hoa, Lam Dong, Ho Chi Minh City and Long An. For instance, the 2009 survey consists of 2,659 firms while the figures for the 2011 and 2013 surveys are 2,552 and 2,575 firms, respectively.

Although the data are generally structured as a cross-sectional structure for each year, a subgroup of SME firms is repeatedly interviewed from year to year. This advantage

enables us to construct a panel sample of manufacturing firms between 2009 and 2013 for this study. After cleaning the data sets and checking the consistent time-invariant characteristics among available variables, we obtain a balanced panel sample of 4,803 firms during 2009–2013. We equivalently have 1,601 firms for each year and a firm on average has nearly six fulltime workers. The summary statistics of the sample is specifically presented in Table I.

Overall, the proportion of firms applying HRM practices as main functional activities are modest. For training activities, only about 5.4 percent of firms from the whole sample provides the training for its newly recruited employees. For another measure of training, the average number of training days that firms give its workers for each training duration is only 1.13 days. Regarding the incentive measures, approximately 20.1 percent of firms delivers additional payments and fringe benefits to their workers as primary people management strategies. Finally, the mean spending for HRM activities per worker is roughly VND1.03m.

Admittedly, SMEs do not widely employ HRM practices as main functions. This is probably due to most Vietnamese SMEs is very small-sized firms. Specifically, micro-firms account for 70.3 percent of the sample while the percentages of small and medium firms are 23.7 and 6 percent, respectively. The lack of resources for HRM practices in micro and small firms highly likely leads to insufficient investments in HRM activities. For instance, while only 1.7 percent of micro-firms provide training, the total figures for small and medium firms are 10.5 and 27.3 percent, respectively. The mean training days are 0.3, 2.2 and 6.2 for micro, small and medium firms, respectively. Table AI provides specific information on HRM practices among firms.

Regarding firm results, average output value, value added and gross profit generated by a worker are, respectively, VND151, 46 and 27m for the whole panel sample. Notably, for the PCI variable, we collect data from the PCI Project, Vietnam Chamber of Commerce and Industry. PCI is a proxy for the quality of business environment of Vietnamese provinces. Other statistics on firm, manager and province characteristics are shown in Table I.

Empirical results

The effects of various HRM practices on firm outcomes are reported in Tables II–V. For each firm outcome as a dependent variable, we present estimates from three different specifications. First, we estimate a parsimonious specification that only consists of HRM practice variable and control variables (firm size, household enterprise, private/sole proprietorship, limited liability company, joint stock company, informal, export, inspection and PCI) (model 1). Second, we estimate an extended specification by adding year fixed effects (model 2). Third, we estimate a full specification that include HRM practice variable, control variables, province fixed effects, year fixed effects and province by year fixed effects (model 3). Three various specifications enable us to test the robustness of the estimation results for each firm outcome.

In each model, we focus on the parameter of interest the coefficient of HRM practice variable (β) that indicate the effect of an HRM practice on firm outcomes under the fixed effects framework. Estimation results from model 3 are used as the baseline estimates for each dependent variable. The coefficients in column 3 for output value per worker, column 6 for value added per worker and column 9 for gross profit per worker from Tables II–V are the baseline estimates. The following subsections present empirical results of the effects of training, incentive measure and HRM spending on firm outcomes.

Training and firm outcomes

This study uses two measures for training including: training dummy for whether a firm provides training for its new workers in last year; and the number of training days.

Table I.
Summary statistics
of the sample

Variables	Definition	2009		2011		2013	
		Mean	SD	Mean	SD	Mean	SD
<i>Dependent variables</i>							
Output value per worker	The real output value per worker (the log of million VND, the original year is 2010)	5.015	0.867	4.905	0.904	5.109	0.849
Value added per worker	The real value of valued added per worker (the log of million VND, the original year is 2010)	3.819	0.757	3.658	0.784	3.925	0.751
Gross profit per worker	The real gross profit per worker (the log of million VND, the original year is 2010)	3.303	0.839	3.174	0.821	3.414	0.857
<i>Independent variables</i>							
HRM practices							
Training	Whether the company provided regular training activities for at least 50 percent of new recruited workers (1 = Yes, 0 = No)	0.054	0.225	0.056	0.229	0.072	0.258
Training days	The mean number of training days for each training activity (days)	1.131	7.019	1.575	9.271	1.412	7.031
Incentive system	Whether the firm provided incentive practices to manage workers including commensurate additional payment systems and fringe benefits (1 = Yes, 0 = No)	0.201	0.401	0.000	0.000	0.321	0.467
HRM cost per worker	The average spending per worker for HRM activities (the log of million VND)	0.027	0.144	0.032	0.196	0.033	0.104
Firm characteristics							
Firm size	The number of fulltime workers (the log)	1.792	1.128	1.904	1.104	1.777	1.151
Household enterprise	Whether the firm's ownership is household (1 = Yes, 0 = No)	0.677	0.468	0.693	0.461	0.676	0.468
Private/sole proprietorship	Whether the firm's ownership private or sole proprietorship (1 = Yes, 0 = No)	0.079	0.270	0.074	0.262	0.082	0.275
Partnership/collective/cooperative	Whether the firm's ownership is partnership or collective or cooperative (1 = Yes, 0 = No)	0.027	0.161	0.027	0.162	0.026	0.158
Limited liability company	Whether the firm's ownership is limited liability company (1 = Yes, 0 = No)	0.180	0.384	0.172	0.377	0.178	0.383
Joint stock company	Whether the firm's ownership is joint stock company (1 = Yes, 0 = No)	0.037	0.189	0.034	0.181	0.038	0.192
Informal	Whether the firm did not register the business, or an informal firm (1 = Yes, 0 = No)	0.336	0.472	0.360	0.480	0.334	0.472
Export	Whether the firm is an exporting enterprise (1 = Yes, 0 = No)	0.062	0.242	0.056	0.229	0.063	0.243
Inspection	Whether the firm was inspected last year for policy, technical or other compliances (1 = Yes, 0 = No)	0.214	0.410	0.568	0.496	0.066	0.248
Manager characteristics							
Main income from firm	Whether income earned from the firm is the main income source of the manager (1 = Yes, 0 = No)	0.869	0.338	0.895	0.307	0.851	0.356
Veteran	Whether the manager is a veteran (1 = Yes, 0 = No)	0.071	0.256	0.071	0.257	0.083	0.276
Party member	Whether the manager is a member of Communism Party of Vietnam (1 = Yes, 0 = No)	0.093	0.291	0.071	0.257	0.104	0.305
Province characteristics							
Provincial competitiveness index (PCI)	The proxy for the quality of business environment for the province where is the firm's location (score)	55.317	4.598	53.152	5.986	56.300	3.109
Observations	The number of firms	4,803		1,601		1,601	
						56.498	3.300

Independent variables	Firm outcomes								
	Output value per worker			Value added per worker			Gross profit per worker		
	Model 1 (1)	Model 2 (2)	Model 3 (3)	Model 1 (4)	Model 2 (5)	Model 3 (6)	Model 1 (7)	Model 2 (8)	Model 3 (9)
Training	0.174*** (0.049)	0.152** (0.052)	0.128** (0.053)	0.118** (0.049)	0.103* (0.047)	0.095* (0.048)	0.139* (0.073)	0.112 (0.064)	0.081 (0.061)
Firm size	-0.375*** (0.034)	-0.374*** (0.026)	-0.380*** (0.028)	-0.287*** (0.025)	-0.274*** (0.019)	-0.278*** (0.021)	-0.478*** (0.034)	-0.482*** (0.027)	-0.485*** (0.030)
Household enterprise									
Private/sole proprietorship	-0.074 (0.224)	-0.082 (0.224)	-0.057 (0.221)	-0.238* (0.119)	-0.222* (0.119)	-0.231* (0.116)	-0.131 (0.125)	-0.147 (0.132)	-0.189 (0.143)
Limited liability company	0.105 (0.204)	0.102 (0.205)	0.117 (0.200)	-0.012 (0.111)	0.004 (0.115)	0.006 (0.110)	0.058 (0.142)	0.048 (0.143)	0.054 (0.147)
Joint stock company	0.149 (0.196)	0.167 (0.195)	0.187 (0.188)	-0.045 (0.112)	-0.026 (0.111)	-0.022 (0.099)	-0.001 (0.121)	0.019 (0.113)	0.007 (0.100)
Informal	0.118 (0.244)	0.120 (0.241)	0.170 (0.223)	-0.018 (0.136)	-0.022 (0.148)	0.001 (0.148)	-0.180 (0.206)	-0.176 (0.219)	-0.159 (0.210)
Export	-0.035 (0.033)	-0.035 (0.039)	-0.049 (0.049)	-0.004 (0.033)	0.004 (0.033)	-0.007 (0.029)	-0.004 (0.031)	-0.006 (0.036)	-0.019 (0.032)
Inspection	0.432*** (0.101)	0.435*** (0.110)	0.473*** (0.121)	0.334* (0.162)	0.324* (0.168)	0.349* (0.179)	0.407*** (0.116)	0.414*** (0.122)	0.443*** (0.116)
PCI	0.075** (0.024)	0.139** (0.059)	0.082* (0.039)	0.013 (0.029)	0.129*** (0.033)	0.103*** (0.029)	0.120*** (0.038)	0.173*** (0.045)	0.134*** (0.038)
Constant	0.028*** (0.008)	0.020* (0.010)	0.035*** (0.001)	0.039*** (0.005)	0.025*** (0.006)	0.040*** (0.001)	0.041*** (0.010)	0.034*** (0.010)	0.050*** (0.001)
R ²	4.121*** (0.499)	4.533*** (0.604)	3.601*** (0.192)	2.310*** (0.291)	3.040*** (0.342)	2.376*** (0.093)	1.920*** (0.531)	2.267*** (0.555)	1.751*** (0.105)
Observations	0.100	0.112	0.134	0.125	0.144	0.159	0.124	0.136	0.159
Province fixed effects	4.803	4.803	4.803	4.803	4.803	4.803	4.803	4.803	4.803
Year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Province by year fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
	No	No	Yes	No	No	Yes	No	No	Yes

Notes: Robust standard errors clustered on the provincial level are in parentheses. Partnership/collective/cooperative is omitted among firm's ownership structure dummies. *, **, ***Significant at 10, 5 and 1 percent levels, respectively

Table II.
Training (yes/no) and
firm outcomes

Table III.
Training days and
firm outcomes

Independent variables	Output value per worker			Firm outcomes			Gross profit per worker		
	Model 1 (1)	Model 2 (2)	Model 3 (3)	Model 1 (4)	Model 2 (5)	Model 3 (6)	Model 1 (7)	Model 2 (8)	Model 3 (9)
Training days	0.005*** (0.001)	0.005*** (0.001)	0.004*** (0.001)	0.004*** (0.0005)	0.004*** (0.0005)	0.003*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.003*** (0.001)
Firm size	-0.371*** (0.036)	-0.371*** (0.028)	-0.378*** (0.030)	-0.285*** (0.026)	-0.273*** (0.020)	-0.276*** (0.021)	-0.476*** (0.035)	-0.480*** (0.028)	-0.484*** (0.030)
Household enterprise	-0.079 (0.226)	-0.085 (0.226)	-0.060 (0.224)	-0.242* (0.120)	-0.225* (0.122)	-0.233* (0.119)	-0.136 (0.127)	-0.150 (0.135)	-0.190 (0.145)
Private/sole proprietorship	0.106 (0.203)	0.103 (0.205)	0.119 (0.200)	-0.011 (0.111)	0.005 (0.115)	0.008 (0.110)	0.059 (0.142)	0.050 (0.143)	0.055 (0.147)
Limited liability company	0.156 (0.194)	0.174 (0.193)	0.193 (0.186)	-0.040 (0.110)	-0.021 (0.109)	-0.018 (0.097)	0.005 (0.121)	0.024 (0.112)	0.011 (0.099)
Joint stock company	0.134 (0.237)	0.134 (0.234)	0.181 (0.217)	-0.007 (0.128)	-0.012 (0.140)	0.009 (0.140)	-0.167 (0.194)	-0.166 (0.209)	-0.152 (0.203)
Informal	-0.034 (0.033)	-0.034 (0.039)	-0.049 (0.049)	-0.004 (0.033)	0.004 (0.033)	-0.006 (0.029)	-0.003 (0.031)	-0.006 (0.036)	-0.019 (0.032)
Export	0.427*** (0.097)	0.430*** (0.106)	0.468*** (0.119)	0.329* (0.160)	0.319* (0.165)	0.344* (0.177)	0.401*** (0.113)	0.408*** (0.120)	0.439*** (0.114)
Inspection	0.072** (0.025)	0.138** (0.059)	0.081** (0.039)	0.010 (0.028)	0.128*** (0.033)	0.102*** (0.029)	0.116** (0.038)	0.171*** (0.046)	0.133*** (0.038)
PCI	0.028*** (0.008)	0.020* (0.010)	0.034*** (0.001)	0.039*** (0.005)	0.025*** (0.006)	0.040*** (0.001)	0.041*** (0.010)	0.034*** (0.010)	0.050*** (0.001)
Constant	4.106*** (0.500)	4.532*** (0.609)	3.603*** (0.189)	2.303*** (0.282)	3.045*** (0.333)	2.381*** (0.090)	1.913*** (0.521)	2.274*** (0.544)	1.759*** (0.087)
R ²	0.100	0.112	0.134	0.125	0.144	0.160	0.125	0.136	0.160
Observations	4,803	4,803	4,803	4,803	4,803	4,803	4,803	4,803	4,803
Province fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Year fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Province by year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes

Notes: Robust standard errors clustered on the provincial level are in parentheses. Partnership/collective/cooperative is omitted among firm's ownership structure dummies. *, **, ***: Significant at 10, 5 and 1 percent levels, respectively

Independent variables	Firm outcomes								
	Output value per worker			Value added per worker			Gross profit per worker		
	Model 1 (1)	Model 2 (2)	Model 3 (3)	Model 1 (4)	Model 2 (5)	Model 3 (6)	Model 1 (7)	Model 2 (8)	Model 3 (9)
Incentive measure	0.055 (0.037)	0.019 (0.031)	0.044 (0.035)	0.082 (0.055)	0.034 (0.047)	0.061 (0.041)	0.058 (0.079)	0.024 (0.064)	0.050 (0.062)
Firm size	-0.367*** (0.037)	-0.369*** (0.029)	-0.376*** (0.031)	-0.280*** (0.026)	-0.271*** (0.020)	-0.274*** (0.021)	-0.471*** (0.035)	-0.478*** (0.028)	-0.482*** (0.030)
Household enterprise	-0.081 (0.230)	-0.088 (0.229)	-0.067 (0.230)	-0.245* (0.124)	-0.228* (0.121)	-0.241* (0.122)	-0.137 (0.132)	-0.153 (0.137)	-0.197 (0.152)
Private/sole proprietorship	0.101 (0.207)	0.098 (0.206)	0.111 (0.203)	-0.018 (0.115)	-0.001 (0.115)	-0.001 (0.113)	0.054 (0.147)	0.044 (0.144)	0.048 (0.152)
Limited liability company	0.147 (0.196)	0.170 (0.193)	0.186 (0.187)	-0.053 (0.108)	-0.028 (0.107)	-0.027 (0.098)	-0.004 (0.120)	0.020 (0.111)	0.003 (0.099)
Joint stock company	0.116 (0.238)	0.127 (0.234)	0.167 (0.218)	-0.033 (0.141)	-0.023 (0.146)	-0.009 (0.150)	-0.186 (0.216)	-0.174 (0.221)	-0.167 (0.218)
Informal	-0.034 (0.032)	-0.034 (0.038)	-0.050 (0.048)	-0.004 (0.035)	0.003 (0.034)	-0.008 (0.030)	-0.003 (0.031)	-0.006 (0.036)	-0.020 (0.032)
Export	0.437*** (0.102)	0.439*** (0.109)	0.479*** (0.122)	0.338* (0.164)	0.328* (0.166)	0.356* (0.178)	0.411*** (0.117)	0.418*** (0.121)	0.449*** (0.115)
Inspection	0.093** (0.032)	0.143** (0.058)	0.084* (0.039)	0.037 (0.022)	0.132*** (0.034)	0.105*** (0.029)	0.138*** (0.041)	0.177*** (0.047)	0.136*** (0.037)
PCI	0.027*** (0.007)	0.020* (0.010)	0.037*** (0.001)	0.038*** (0.006)	0.026*** (0.006)	0.042*** (0.002)	0.041*** (0.011)	0.035*** (0.010)	0.051*** (0.002)
Constant	4.121*** (0.465)	4.487*** (0.611)	3.515*** (0.179)	2.344*** (0.319)	2.999*** (0.324)	2.274*** (0.121)	1.932*** (0.580)	2.228*** (0.529)	1.668*** (0.135)
R ²	0.098	0.110	0.132	0.126	0.142	0.160	0.124	0.135	0.159
Observations	4,803	4,803	4,803	4,803	4,803	4,803	4,803	4,803	4,803
Province fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Year fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Province by year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes

Notes: Robust standard errors clustered on the provincial level are in parentheses. Partnership/collective/cooperative is omitted among firm's ownership structure dummies. *, **, ***Significant at 10, 5 and 1 percent levels, respectively

Table IV.
Incentive measure and
firm outcomes

Table V.
HRM spending and
firm outcomes

Independent variables	Output value per worker			Firm outcomes			Gross profit per worker		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
HRM cost per worker	0.264*** (0.072)	0.235** (0.075)	0.208** (0.068)	0.192*** (0.033)	0.171*** (0.030)	0.171*** (0.028)	0.154 (0.092)	0.119 (0.082)	0.107 (0.065)
Firm size	-0.369*** (0.038)	-0.369*** (0.029)	-0.376*** (0.032)	-0.282*** (0.026)	-0.271*** (0.020)	-0.275*** (0.022)	-0.473*** (0.036)	-0.478*** (0.028)	-0.482*** (0.031)
Household enterprise	-0.083 (0.225)	-0.090 (0.225)	-0.065 (0.223)	-0.245* (0.119)	-0.228* (0.120)	-0.237* (0.118)	-0.137 (0.127)	-0.152 (0.134)	-0.193 (0.145)
Private/sole proprietorship	0.095 (0.204)	0.093 (0.205)	0.109 (0.200)	-0.019 (0.112)	-0.003 (0.115)	0.0001 (0.110)	0.052 (0.142)	0.043 (0.143)	0.049 (0.148)
Limited liability company	0.142 (0.194)	0.161 (0.192)	0.182 (0.185)	-0.050 (0.110)	-0.031 (0.109)	-0.027 (0.097)	-0.003 (0.121)	0.017 (0.112)	0.004 (0.099)
Joint stock company	0.125 (0.236)	0.126 (0.232)	0.174 (0.215)	-0.014 (0.126)	-0.018 (0.137)	0.004 (0.138)	-0.173 (0.192)	-0.170 (0.208)	-0.156 (0.202)
Informal	-0.035 (0.033)	-0.035 (0.039)	-0.049 (0.049)	-0.004 (0.033)	0.003 (0.033)	-0.007 (0.029)	-0.003 (0.032)	-0.006 (0.036)	-0.019 (0.032)
Export	0.428*** (0.101)	0.431*** (0.109)	0.471*** (0.121)	0.330* (0.165)	0.321* (0.169)	0.346* (0.180)	0.405*** (0.117)	0.413 (0.173)	0.443*** (0.117)
Inspection	0.074** (0.026)	0.138** (0.059)	0.080* (0.039)	0.012 (0.028)	0.128*** (0.034)	0.101*** (0.029)	0.120** (0.040)	0.173*** (0.046)	0.133*** (0.038)
PCI	0.029*** (0.007)	0.020* (0.009)	0.034*** (0.0006)	0.040*** (0.005)	0.026*** (0.006)	0.040*** (0.001)	0.042*** (0.010)	0.035*** (0.010)	0.050*** (0.001)
Constant	4.076*** (0.481)	4.492*** (0.595)	3.629*** (0.183)	2.279*** (0.280)	3.011*** (0.336)	2.400*** (0.090)	1.885*** (0.520)	2.237*** (0.549)	1.762*** (0.101)
R ²	0.100	0.112	0.134	0.125	0.144	0.160	0.123	0.135	0.159
Observations	4,803	4,803	4,803	4,803	4,803	4,803	4,803	4,803	4,803
Province fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Year fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Province by year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes

Notes: Robust standard errors clustered on the provincial level are in parentheses. Partnership/collective/cooperative is omitted among firm's ownership structure dummies. *, **, ***Significant at 10, 5 and 1 percent levels, respectively

Tables II–III present the estimation results for the impacts of training on firm outcomes corresponding with a specific measure for training activities among firms.

For the impact of a training course for new workers, the estimates from Table II overall indicates that firms with training tend to have better outcomes compared to ones without training. For the output value per worker, the baseline coefficient is statistically significant at 5 percent as shown in column 3. In an economic sense, the baseline estimate indicates that, on average, a firm with training leads to a nearly 13.7 percent increase of output value per worker compared to a firm without training. Columns 1 and 2 show statistically significant effects of training on output value per worker at 1 and 5 percent when using the first and second econometric models, respectively. The corresponding magnitudes of the effects are approximately 19.0 and 16.4 percent. It is obvious that when province, year and province by year fixed effects (model 1) are included in the model, the effect magnitude is smaller than the commensurate figures for the model without any mentioned fixed effects (model 1) and the model with only year fixed effects (model 2).

Meanwhile, column 6 indicates a positive impact of training on value added per worker at a 10 percent level of statistical significance. This baseline estimate indicates that providing the training for new workers improves a firm's value added per worker by about 10 percent in comparison with the counterpart. Using other econometric specifications, we also find statistically significant impacts of training on value added per worker at 5 percent for model 1 in column 4 and 10 percent for model 2 in column 5. The degrees of effects are 12.5 and 10.8 percent for model 1 and model 2, respectively.

Notably, the baseline estimate for gross profit per worker loses its statistical significance at conventional levels as presented in column 9 of Table II. The only estimate using model 1 in column 7 is statistically significant at 10 percent for the gross profit per worker. This estimate suggests that, on average, giving training to new workers raise a firm's profitability by a 14.9 percent rise of gross profit per worker, compared to a firm that does not offer any training activities for its new employees.

Apparently, the estimates from Table II as discussed above generally demonstrate that training has positive and significant impacts on a firm's output value per worker, value added per worker and gross profit per worker. Among three firm outcomes, training generates the largest on for output value per worker with a 13.7–19 percent increase. Next, a firm's gross profit per worker gains a 14.9 percent rise by adopting training. Finally, training improves a firm's value added per worker by an additional amount of 10–12.5 percent.

The effects of training are more apparent for the measure of training days in Table III. Accordingly, the estimates are strongly statistically significant at 1 percent for all three specifications and all three outcomes.

Columns 1–3 of Table III show that one additional day for training new employees gives increases in output value per worker. The estimates from three specifications almost suggest the same magnitudes of the effects. In particular, one more ten-day training leads to rises in output value per worker by 4.1–5.1 percent. For the baseline result from column 3, a firm's spending one more ten-day training for new workers results in an 4.1 percent increase in its output value per worker.

In the same pattern, the estimates in columns 4–6 of Table III demonstrate that on average an additional ten-day time for training new employees improves a firm's value added per worker by 3.0–4.1 percent, in which the marginal effect from the baseline model is 3.0 percent. Finally, the estimates for gross profit per worker in column 7–9 also show the marginal effects of additional gross profit per worker stemming from an increased ten-day training duration span between 3.0 and 5.1 percent in which the baseline effect is a 3.0 percent increase in gross profit per worker. There are no considerable differences in the magnitudes among these three firm consequences. Moreover, these findings show the strong robustness of positive impacts of training day on firm outcomes.

Incentive measure and firm outcomes

Table IV presents the estimation results of the impact of incentive measure on firm outcomes. Somewhat surprisingly, we find no statistically significant evidence on the effects of incentive measure on firm outcomes using all econometric specifications.

Although the estimates using all specifications for all firm outcomes loses the statistical significance at traditional levels, they still indicate positive and considerable impacts of adopting incentive measure as primary practices for managing people within a firm on output value per worker, value added per worker and gross profit per worker. Specifically, adopting incentive measure contributes to a rise of output value per worker by 4.5 percent for the baseline estimate from column 3 of Table IV. The estimates from model 1 and model 2 implies the improved output per worker by about 5.7 and 1.9 percent, respectively, as consequences of using incentive measure.

Meanwhile, the corresponding figures for value added per worker are 8.5, 3.5 and 6.3 percent using model 1 in column 4, model 2 in column 5, and model 3 in column 6, respectively. For the gross profit per worker, the marginal contributions of employing incentive measure are 6.0, 2.4 and 5.1 percent using model 1 in column 7, model 2 in column 8, and model 3 in column 9, respectively.

HRM spending and firm outcomes

Finally, Table V presents the estimation results for the impact of HRM cost on firm consequences. The findings show that there are statistically significant effects of HRM spending on the output value per worker and the value added per worker. However, we are unable to discover the statistically significant effects of HRM spending on the gross profit per worker at any conventional levels.

Columns 1–3 of Table V show the estimates for the output per worker. The baseline estimate in column 3 of Table V suggests that for any 10 percent increase in HRM spending, there is a 2 percent rise in output value per worker. The corresponding effects using models 1 and 2 in columns 1 and 2, respectively, are 2.5 and 2.3 percent. While the estimate, using model 1, is statistically significant at 1 percent, the estimates from model 2 and model 3 are both statistically significant at 10 percent.

The estimates from columns 4–6 are all statistically significant at 1 percent. The baseline estimate for value added per worker in column 6 of Table V indicates that the contribution for spending more 10 percent on HRM activities is about 1.6 percent higher in value added per worker. For other specifications, we find that the marginal effects of additional 10 percent in HRM spending are, respectively, approximately 1.8 and 1.6 percent rises in value added per worker.

However, we cannot find the statistically significant estimates from different specifications for gross profit per worker, although the directions and magnitudes of the estimates are similar to those for other firm outcomes. In particular, an additional 10 percent spending on HRM activities leads to rises of 1.5, 1.1 and 1.0 percent in gross profit per worker using model 1 in column 7, model 2 in column 8 and model 3 in column 9, respectively. Among these effects, 1.0 percent is the marginal effect from the baseline estimate.

Further robustness checks

In this section, we check the sensitivity of the results to extended specifications. We include more control variables for the firm manager's characteristics into three specifications as reported in the last section, which consist of whether the manager's main income source is from the firm, whether the manager is a veteran, and whether the manager is a member of the Communist Party of Vietnam (CPV).

Table VI provides the parameters of interest (β) for three firm outcomes using three extended specifications. Overall, the estimated coefficients do not significantly change in the direction and the magnitude as well compared to the main estimates reported from the previous section.

Specifically, the estimates for the effects of a training course are qualitatively similar to those in Table II. The estimates in columns 1, 2 and 3 suggest that the contributions to output value per worker of a firm that provides training for its new workers are between 14.2 and 19.7 percent relative to those who does not. The result estimated from the baseline extended specification in column 3 shows a 17.1 percent increase in output value per worker commensurate with delivering training that is insignificantly larger than the baseline result of 13.7 percent in column 3 of Table II. The estimates are strongly statistically significant at 1 percent for column 1 and 2, and 5 percent for column 3, respectively.

Meanwhile, the positive impacts of doing training on a firm's value added per worker are 13.0, 11.3 and 10.4 percent corresponding to the uses of model 1 in column 4, model 2 in column 5 and model 3 in column 6, respectively. The baseline estimate from the extended model in column 6 is roughly the same to that in column 6 of Table II with effects of 10.4 and 10.0 percent, respectively. The estimates are statistically significant at 1 percent for all three extended specifications. Columns 7–9 show the impacts of training on firm's gross profit per worker spans between 8.9 and 15.5 percent, although the baseline extended estimate loses its statistical significance. It is important to recognize that when more controls for manager characteristics are added, evidence on the positive impacts is more apparent with the increases in the statistical significance of the estimates. We see that the estimates are robust to the main estimates in Table II.

The estimates for the effects of training days on firm outcomes using extended specifications are more strongly consistent with those using the main specifications as in Table III in both the significant levels and the magnitudes of the effects. The only small exception is the estimate in column 6 that suggests a ten-day training course leads to a 4.0 percent increase in value added per worker compared to 3.0 percent in the result in column 6 of Table III. However, this change is very small and thus unimportant.

The findings of the impacts of incentive measure on firm outcomes are also similar to those from the main results presented in the previous section. The estimates are by no means statistically significant at any traditional levels, although the magnitudes and the directions of the impacts are also analogous to the main estimates in Table IV.

Finally, we consider the robustness of the estimates for HRM spending. The estimates using extended specifications as shown in Table IV indicate the robust effects. For example, we also find statistically significant and positive effects in the cases of output value per worker and value added per worker. The estimates for output value per worker are significant at the 1, 5 and 5 percent levels for model 1, model 2 and model 3 in columns 1, 2, and 3 respectively, while the corresponding figures for value added per worker in columns 4–6 are all 1 percent. Nonetheless, the estimates for gross profit per worker are all statistically insignificant for all extended specifications. This finding is similar to the main estimates in Table V.

In conclusion, the estimated results for the further robustness checks in Table VI demonstrate that the main findings of significant and apparent effects of training both for measures of binary and training days, and HRM spending on firm outcomes are strongly robust regardless of a variety of estimation specification choices. The findings of statistically insignificant effects of incentive measure on all firm outcomes are also consistent for various modeling choices.

Conclusion

The current paper employs a fixed-effects framework to estimate the effects of HRM practices on firm outcomes using a panel sample of small- and medium-sized firms in Vietnam. We find

Table VI.
Further robustness
checks

Independent variables	Output value per worker			Firm outcomes			Gross profit per worker		
	Model 1 (1)	Model 2 (2)	Model 3 (3)	Model 1 (4)	Model 2 (5)	Model 3 (6)	Model 1 (7)	Model 2 (8)	Model 3 (9)
Training	0.180*** (0.046)	0.158*** (0.048)	0.133** (0.049)	0.122** (0.044)	0.107*** (0.043)	0.099*** (0.043)	0.144** (0.068)	0.117** (0.058)	0.085 (0.056)
Training days	0.005*** (0.001)	0.005*** (0.001)	0.004*** (0.001)	0.004*** (0.0005)	0.004*** (0.0005)	0.004*** (0.0005)	0.005*** (0.001)	0.005*** (0.001)	0.003*** (0.001)
Incentive measure	0.056 (0.036)	0.020 (0.031)	0.046 (0.034)	0.084 (0.055)	0.034 (0.046)	0.063 (0.041)	0.060 (0.078)	0.025 (0.063)	0.051 (0.061)
HRM cost per worker	0.259*** (0.070)	0.229*** (0.073)	0.201*** (0.066)	0.187*** (0.035)	0.164*** (0.032)	0.163*** (0.030)	0.147 (0.097)	0.111 (0.087)	0.098 (0.070)
Province fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Year fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Province by year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes

Notes: Robust standard errors clustered on the provincial level are in parentheses. All regressions consist of constant, HRM practice, firm size, household enterprise, private/sole proprietorship, limited liability company, joint stock company, informal, export, inspection, PCI and additional control variables for manager characteristics including main income source, veteran, and CPV member. The number of observations for all regressions is 4,803. *, **, ***, Significant at 10, 5 and 1 percent levels, respectively

the significantly robust results of positive impacts of training and per capita HRM spending on a firm's output value per worker, value added per worker and gross profit per worker. On average, a firm that provides the training for new workers generate about 13.7 percent higher in the output value per worker, 10 percent higher in the value added per worker and 14.9 percent higher in the gross profit per worker than its counterpart. Moreover, an additional ten-day training period for new employees, on average, causes a 4.1 percent increase in output value per worker, a 3.0 percent rise in value added per worker and a 3.0 percent growth in gross profit per worker.

Training is conventionally seen as an important factor of employees' human capital and it, in turn, improves firm outcomes such as productivity or firm survival. Our findings on the positive effects of training on firm outcomes are consistent with other previous studies' results of Zwick (2006) for Germany, Barrett and O'Connell (2001) for Ireland, and Nguyen *et al.* (2011) for China and Vietnam.

We also find that the contributions for a marginal 10 percent spending on HRM practices creates about 2 percent and 1.6 percent higher output value per worker and value added per worker, respectively. We do not find statistically significant evidence on the impacts of HRM spending on the gross profit per worker.

In contrast to the apparent impacts of training and HRM spending on firm outcomes, we surprisingly find by no means statistically significant estimates on the effects of incentive measure on firm outcomes using all econometric specifications. This finding is contrast to the results from King-Kauanui *et al.* (2006) in which the incentive measure has the largest effect on the firm performance in Ha Noi, Vietnam.

In conclusion, HRM practices undoubtedly play important roles in outcome improvements among Vietnamese SMEs. Training is one the of measures for the upgrading human capital of employees inside firm that in turn improves firm outcomes. In another manner, how much a firm spends on HRM activities implicitly indicates the degree of the application of HRM into its functions. These are possible explanations for the positive impacts of training and HRM spending on firm outcomes in Vietnam. Despite successfully exploring the roles of HRM on improvements in firm outcomes with specific measures of marginal effects, we have not explored an important research gap that what is a main mechanism through which HRM practices influence firm outcomes in Vietnam, which is a crucial research question for further studies.

Notes

1. While HRM practices commonly consist of incentive/performance pay, profit-related pay, self-managed teams, performance feedback, job rotation, regular meetings and training, productivity is a common proxy for firm outcomes in economics (Bloom and van Reenen, 2011).
2. HRM-related practices probably consist of paying structure, work organization and incentive mechanism.
3. Note: to handle some variables with negative or zero values, we implement log transformation using the Stata commands.
4. PCI is constructed based aggregate information at the provincial level regarding different dimensions which include the market entrance, land access, transparency, time cost, informal cost, dynamic environment, business assistance, labor training, and legal institution (VNCI, 2008, 2010, 2012).
5. Although Ha Tay province has been amalgamated into Ha Noi since 2008, SMEs surveys carried out after 2008 have classified firms in Ha Tay and Ha Noi in two different provinces.

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Appendix

HRM practice	Total	Micro firm	Small firm	Medium firm
Training (percent)	5.4	1.7	10.5	27.3
Training (days)	1.1	0.3	2.2	6.2
Incentive measure (percent)	20.1	18.2	23.6	28.7
Per capita HRM spending (million VND)	0.05	0.01	0.12	0.21

Table AI.
HRM practices
classified by firm size

