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The Impact of Human Resource Management Practices on Total Factor Productivity of Small and Medium Enterprises in Vietnam

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Abstract:
The productivity of small and medium-sized enterprises (SMEs) has attracted considerable interest among scholars across the world. However, the number of studies is quite small, in one firm or one industry. This study examines nearly 5000 firms to explore the impact of human resource management (HRM) practices of SMEs in Vietnam. Using Generalized Method of Moments model (GMM) and data collected from Central Institution for Economic Management (CIEM) in 2011, 2013 and 2015, the results show that two HRM practices, including job rotation and fringe benefits, have a positive effect on Total Factor Productivity (TFP) while union and training have not been proven its impact on TFP since significance levels are higher than 10%. We also make some suggestions for companies to increase TFP growth.

Keywords: *Human resource management practices, total factor productivity, small and medium-sized enterprises in Vietnam*

1. Introduction

It has been widely recognized that small and medium-sized enterprises (SMEs) have a significant role to play in fostering a country's competitive advantage. SMEs are important in revitalizing the economy, preserving and creating employment, all of which are especially crucial when the economy is going through crisis situations (Mañez, 2012). In Vietnam, the average growth rate of SME sector has reached approximately 14% per year from 2006 to 2015 (Trinh& Thanh, 2017). However, based on the data of International Labor Organization (ILO) in 2015, the labor productivity of SMEs in Vietnam is trivial in comparison with other countries in ASEAN Economic community.

To ensure the survival and growth of the economy, one of the key solutions is to enhance the level of productivity of SMEs. This can be done by effective human resource management (HRM) practices (Jarad, 2010). Bloom and Reenen (2011) also suggested that HRM practices play an important role in productivity of SMEs, especially TFP.

The aim of this study is to examine the impact of HRM practices on TFP of SMEs in Vietnam. This is because previous research was mostly carried out in small number of samples, such as 26 steel manufacturers (Ichniowski, Shaw, & Prennushi, 1997), 439 Indian hotels (Budhwar, Chand, & Katou, 2007) and 456 Chinese companies (Akhtar, Ding, & Ge, 2008). Our study uses the data from nearly 5000 small and medium enterprises in Vietnam.

This paper is divided into 5 parts. Firstly, we provide a short literature review of HRM practices and how they affect TFP. Secondly, we show data source, samples and measurements of dependent, independents and control variables. The next section illustrates the results while the last one makes some discussions and some suggestions for managers.

2. Literature Review and Hypotheses

2.1. Human Resourse Management Practices (HRM Practices)

HRM practice has been researched for quite a long time and has no agreement on its components. Tan & Nasurdin (2011) concluded that HRM practices relate to specific practices in enterprises, including formal policies and management philosophies designed to attract, develop, motivate and maintain human resource to ensure effectiveness and survival of the organization. On the other hand, Barret and Mayson (2007) argued that strategic HRM provides the ability for internal firms to adapt to the competitive environment by arranging recruiting, selection, training, reward and development system. Because of these points of view, it can be concluded that HRM should be considered as a strategic process involving formal and informal policies designed to identify, attract, compensate, hold, assess and develop human resources

in a way that ensures the growth and sustainable development of both employees and employers. Therefore, it can be affirmed that HRM practices must achieve a balance between the needs of employees and employers to lead to a high level of organizational performance (Marlizar, 2018). In this study, we found that the approach to HRM practices from the perspective above is appropriate.

2.2. Total Factor Productivity (TFP)

Total factor productivity (TFP) plays an important role in the development of each organization. The concept of TFP has changed and expanded over time. From initial studies, TFP is understood as the balance between the growth rate of output and input, and it is expressed through Divisia indicators (Solow, 1957). Similarly, Giang, Xuan, Trung, Que, and Yoshida (2018) suggested that TFP is the weighted average power of all inputs. However, these definitions do not fully reflect the enterprise's TFP. After that, scholars recognize TFP in a different perspective. For example, the Vietnam Productivity Institute (2018) defined "TFP is an indicator to measure the productivity of both labor and capital in one specific activities or for the whole economy. TFP reflects the progress of science, technology and equipment. The increase in output depends not only on the increase in the quantity of inputs (traditional mode) but also on the quality of labor and capital". In keeping with the reality of Vietnamese SMEs, the research team found that the definition above of TFP is appropriate to use.

2.3. The Relationship between HRM Practices and TFP

HRM practices include formal planning on human resource, compensation, training, promotion and human resource development (Minbaeva, 2005). From the empirical studies, HRM practices play an important role in TFP growth in enterprises. Especially, the implementation of training activities, human capital accumulation makes TFP grow drastically in the application period (Shujing &Chaoming, 2006). In addition, Jajri and Ismail (2006) showed that the activities related to human resource development, human resource management and personnel structure affect productivity. This is evident when they compared India's TFP with the United States' TFP, the results show that the country has improved HRM practices with TFP growth more stable. Talking about labor contracts, Bental and Demougin (2006) argued that the application of contracts effectively promote employee motivation and TFP enhancement.

Many researchers have a similar view on these relationships, in which Black & Lynch (2001) have pointed out that HRM practices explain the change of TFP of firms and in some respects, two variables will have a close relationship with each other. The study of Ma and Lu (2015) showed the relationship between improving the quality of human resources (high-tech human resources) with TFP in enterprises. The research results express that these two variables are positively related and support each other.

- *Hypothesis: HRM practices have a positive impact on TFP.*

3. Method

3.1. Measurement

In this study, TFP is measured by following this formula:

Estimating productivity by Ordinary Least Squares – OLS produces biased results for TFP's estimation; therefore, estimating TFP using method introduced by Levinsohn and Petrin (2003) is to provide better results (Van Beveren, 2012). In this study, TFP is estimated following proposals of Levinsohn and Petrin (2003). To begin with linear production function:

$y_{it} = \beta_0 + \beta_l l_{it} + \beta_k k_{it} + \beta_m m_{it} + \omega_{it} + \eta_{it}$

$\omega_{it} = \beta_0 + v_{it}$ is defined as firm's current productivity and $\eta_t$is error uncorrelated to independent variables. Therefore, productivity can be estimated by the following recipe:

$\hat{\omega}_{it} = \hat{\beta}_0 + \hat{v}_{it} = y_{it} - \hat{\beta}_k k_{it} - \hat{\beta}_l l_{it} - \hat{\beta}_m m_{it}$

Finally, to estimate TFP, we take natural logarithm of $\hat{\omega}_{it}$. TFP is used to appraise effects of distinctive independent variables to TFP.

In this study, y_t is logarithm of firms' value added; l_t is logarithm of total number of labors within organizations, k_t is logarithm of the total value of capital; m_t is investment in machinery and equipment.

Dependent, independent and control variables are shown in table 1.

Variable		Measurement
HRM	Fringe benefits	Whether the firm provides fringe benefits for their employees (1= Yes, 0= No)
	Union	Whether the firm has company union (1= Yes, 0= No)
	Job rotation	Whether operators rotate across jobs or tasks on the line (1= Yes, 0= No)
	Training	Whether the company provided regular training activities for at least 50% of new recruited workers (1=Yes, 0= No)
TFP	LnVA	Ln (Value added)
	LnCap	Ln (The total value of capital at the end of year)
	Ln_mm	Ln (The total value of investment in machinery and equipment)
Control variables	Export	Whether the firm exports their goods (1=Yes, 0= No)
	Labor	Ln (the total number of firms' employees)
	Ownership	Ownership is divided into 5 forms: households, private sectors, cooperatives, limited companies, joint-stock companies.
	Firm age	Ln (fiscal year – established year)
	Trend	Trend = 1 if surveyed year is 2011 Trend = 2 if surveyed year is 2013 Trend = 3 if surveyed year is 2015

Table 1: Variable Measurements

3.2. Data

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 (GSO) of Vietnam, Vietnamese Institute of Labor Science and Social Affairs (ILSSA), and Central Institute for Economic Management (CIEM) of Vietnamese Ministry of Investment and Planning. The sample includes about 2600 firms located in 10 Vietnamese provinces including Ha Noi, Phu Tho, Ha Tay, Hai Phong, Nghe An, Quang Nam, Khanh Hoa, Lam Dong, Ho Chi Minh City and Long An. For example, the 2011 survey consists of 2552 firms while the figures for 2013 and 2015 surveys are 2575 and 2649 firms, respectively.

Variable		Observations	Mean	Standard deviation
TFP		4,812	10.2973	.7704523
HRM	Fringe benefits	4,812	.2869909	.4524043
	Union	4,812	.1016209	.3021806
	Job rotation	4,812	.0434331	.2038511
	Training	4,812	.0931006	.2906035
Control variables	Export	4,812	.0644223	.2455292
	Labor	4,812	1.892969	1.150693
	Ownership	4,812	1.862635	1.34322
	Firm age	4,812	2.605234	.6015798

Table 2: Descriptive Analysis
Resource: Calculation of authors

From the summary statistic of the sample represented in table 2, for training activities, only about 9.31% of firms from the whole sample provided a training program for their new recruited employees. In addition, the figures for union, job rotation and fringe benefits are 10.16%, 4.34% and 28.69% respectively. Regarding to export, there is just roughly 6.44% firms exported their goods to other countries. Moreover, the average firm age is around 2.6 year. Finally, over the period from 2011-2015, on average, TFP is approximately 10.29 unit.

3.3. Data Processing

Although, the data is generally structured as a cross-sectional structure for each year, a subgroup of SMEs is repeatedly interviewed from year to year. This advantage enables us to construct a panel sample of manufacturing firms from 2011 to 2015 for this study, which includes 4 steps

- Firstly, the data was collected from three different SMEs surveys taken place in 2011, 2013 and 2015
- Secondly, we calculated and extracted necessary indicators for the study based on the given data sources
- Next, we eliminate observations which have insufficient information and negative value added (VA)
- Finally, due to the studied period from 2011 to 2015, we select companies have been working continuously during the given time

Therefore, the final data includes 1604 firms from each survey, which means there are 4812 researched organizations in total.

There are several different methods to estimate statistic models. OLS model needs to meet some assumptions which many researchers from all over the world have been testing and indicating that coefficients are inconsistent and biased. Therefore, other alternative methods introduced to fix OLS problems such as Fixed Effect method (FE), Random

Effect method (RE), Generalized Least Squares (GLS) are proposed to produce homoscedasticity; estimating by instrument variable (IV) or Two-stage Least-Square (2SLS) when end ogeneity problem occurs. Recognizing issues in regression models always can be done by using tests. However, Generalized Method of Moments (GMM) considered to be a general method of a lot of those mentioned common methods. Even if endogeneity conditions are violated, GMM still produces consistent, unbiased and effective coefficients. GMM, in general, is used for panel data; especially, when repeat year (T) is many times smaller than observations (N), or inconsistency data.

The regression equation is as follow:

$TFP_{i,t} = \alpha_0 + \alpha_1 HRM_{i,t} + \alpha_2 Control_{i,t} + \varepsilon_i$

While $TFP_{i,t}$ measures the firm's current productivity for a firm i and a year t, the $HRM_{i,t}$ denotes a HRM practices that are employed by a firm i, in a year t. HRM practices include a wide range of HRM practices that are carried out by a firm over the previous years. Additionally, the $Control_{i,t}$is a vector of control variables for firm characteristics from the main specification. In particular, control variables include (1) whether a firm exports their products (2) the total number of workers (3) form of ownership (4) firm age (5) trend.

4. Result

To analyze the impact of HRM practices on TFP, to begin with, we run a correlation table (Table 3) to appraise the strength of the relations. In addition, to get further quantitative analysis, we use GMM model, the results are indicated at table 4.

	TFP	**Union**	**Job rotation**	**Training**	**Fringe Benefits**
TFP	1.0000				
Union	0.1940	1.0000			
Job rotation	0.1070	0.2084	1.0000		
Training	0.1171	0.2331	0.1598	1.0000	
Fringe benefits	0.3247	0.5073	0.1826	0.2505	1.0000

Table 3: Correlations between Studied Variables
Resource: Calculation of Authors

Table 3 indicates the correlations between all variables in the study. It is clear that all of the correlations between TFP and HRM activities (including fringe benefits, union, job rotation and training) are positive, which means, for example, the more training activities a firm provides for their production labors, the more TFP within these organization is to gain. It is also noticeable that the correlation between fringe benefits and TFP is the strongest (the figure is 0.3247), while the weakest one is of job rotation (0.1070).

	TFP		
	coeff	Robust Std. Err	P_value
GMM			
Union	-.0629809	.0442994	0.155
Job rotation	.111306	.0594893	0.061
Training	-.0221316	.0352198	0.530
Fringe benefits	.2506191	.0311739	0.000
Export	.0162295	.0497881	0.744
Ownership			
Private sectors	.2091411	.0437125	0.000
Cooperatives	-.0628351	.060023	0.295
Limited companies	.1880304	.0399213	0.000
Joint-stock companies	.0069699	.0593688	0.907
Firm age	-.1468676	.020135	0.000
Labor	.1028044	.0158037	0.000
Trend	.1123025	.0135654	0.000
B0	10.14101	.0578497	0.000

Table 4: GMM Result
Instruments for Equation 1: Union Job Rotation Training Fringe Benefits Export 0.Ownership 1.Ownership 2.Ownership 3.Ownership 4.Ownership 5.Ownership Firm Age Labor Trend _Cons
Resource: Calculation of Authors

The regression model is:

$TFP_{i,t}$ = 10.14101+ -.0629809*$Union_{i,t}$ +.111306*Job $rotation_{i,t}$+ -.0221316*$Training_{i,t}$ +.2506191*Fringe $benefits_{i,t}$ + .0162295*$Export_{i,t}$+.2091411*Private $sectors_{i,t}$-.0628351*$Cooperatives_{i,t}$ +.1880304*Limited $companies_{i,t}$+.0069699*Joint-stock $companies_{i,t}$ -.1468676*Firm $age_{i,t}$+ .1028044 *$Labor_{i,t}$+.1123025*Trend

From table 4, authors come to some significant conclusions:

Firstly, the relationship between union, training activities and TFP are not proved yet due to p_value > 0.1. In contrast, the positive influences of job rotation and fringe benefits on TFP have been proved with statistical meaning at 10% and 1% respectively. In particular, if a firm rotates jobs of their production workers, TFP will be .111306 unit higher than before. The same applied for fringe benefits, meaning that when a manufacturing organization provides fringe benefits for their employees, TFP is .2506191 unit higher than that does not. It is noticeable that the impact of fringe benefits to TFP is stronger than that of job rotation (.2506191 >.111306) and at higher confidence interval (10% and 1% respectively).

Secondly, the majority of control variables are proved to have positive influences on TFP. For example, the coefficient between Labor and TFP is .1028044 > 0; which means, when a firm employs one more production worker, their TFP is .1028044 unit higher than that does not. This conclusion has statistical meaning at 1%. On the other hand, some relationship between control variables and TFP are not proved yet. For instance, the positive effect of export on TFP is not proved due to high p_value (0.744).

5. Discussion and Conclusion

The results of this study indicate that there is a positive relationship between HRM practices and TFP. Specifically, job rotation in the enterprise and fringe benefits are proved to contribute to the organization's TFP growth. This is similar to Xiao's view(1991) that every business can significantly increase productivity through developing its fringe benefits policies. In addition, Cristini and Pozzoli (2010) pointed out that job rotation shows a positive and strongly significant relation with performance of companies in businesses in Italy and the UK. Besides, the findings have not yet demonstrated the impact of training and union on TFP. This result may be because the impact of the above variables not clear in SMEs in Vietnam.

On the basis of the research findings, several solutions are proposed to help SMEs Vietnam improve TFP through promoting HRM activities. First, businesses need to have effective human resource policies. According to CristineFelt (2018), to achieve maximum efficiency in using resources, businesses need to organize and arrange appropriate personnel. This will also help businesses achieve higher productivity and more development opportunities. Second, to have higher growth of TFP, businesses can improve the fringe benefits policies for employees. Previous research has shown that improving the allowance policies for employees will give them great motivation to work and achieve higher work efficiency. Because of the limitation of data used in this research, the measurement of HRM practices are restricted. In other words, there are other things such as selection and recruitment, employee benefits,further research can find out the realtionship between HRM practices and TFP with different results.

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