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Cost of corruption and efficiency in employment of firms: The case in Vietnam

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A B S T R A C T

This paper examines the impact of corruption on employers' efficiency in Vietnamese firms. The Generalized Least Square (GLS) estimation method was used for data sets surveyed for Vietnamese firms in 63 localities. The research results show that the unofficial costs in the industry and the total informal costs accounting for 10% or more of revenue will negatively affect the labor efficiency of these enterprises. For costs related to administrative procedures, businesses accept to pay these fees in order to save waiting time and it contributes to increase the efficiency of employers in businesses. In addition to the corruption factor, the study also shows that the number of employees, the location of operation, the average value of fixed assets per employee and the return on equity also affect the efficiency of use. employees in Vietnamese enterprises.

1. Introduction

Studies compile survey data based on measures of corruption at the country level, such as the Corruption Perceptions Index (CPI) estimated by Transparency International or the Control of Corruption index of the World Bank's World Governance Index all shows that poor countries tend to be most corrupt. Explaining this situation, scholars believe that in developing countries, their resources for controlling corruption are often limited or absent. As a result, poor countries tend to have higher levels of corruption (De Rosa, Gooroochurn, & Gorg, 2010). The effects of corruption on production and business activities have been studied by many scholars. Some studies have suggested that corruption in some cases positively affects and enhances the performance of firms because it helps them overcome institutional weaknesses and heavy regulatory requirements. Lui (1985) argued that the size of bribery in economics reflects different opportunity costs of firms. Therefore, more efficient businesses are more likely to be willing to pay for these costs. It results in licenses or incentives obtained based on the size of the bribe that can achieve an optimal Pareto allocation. Countries with less legal environments often use technical barriers (Alesina, Alberto, Silvia Ardagna, Giuseppe & Fabio, 2005), bureaucratic behavior, and paper (red tape) to hinder businesses when entering the market. These behaviors lead to suppressing competition for businesses and increase opportunities for state officials to become corrupt. This reduces firm productivity and negatively impacts new business entry (Djankov, Simeon, Rafael, Florencio & Andrei, 2002). Kaufmann and Wei (1999) argued that the legal burden is exogenous, so the optimal distributive nature that Lui (1985) mentions is a partial equilibrium. Hence, corruption can have a positive effect of corruption on firm performance in the short run but it cannot keep them in general equilibrium in the long run. Supporting the views of Kaufmann & Wei (1999), Aidt and Dutta (2008) suggest that short-term corruption can help firms overcome heavy regulatory requirements, but this inadvertently creates incentives. to create more such regulations in the long run.

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In addition, corruption falsified the allocation of financial resources (Svensson, 2003), and falsified the allocation of business talent (Murphy, Shleifer & Vishny, 1991, 1993; Acemoglu & Verdier 1998), according to which source force, instead of going into production, is used as a bribe. Recently, a number of studies on institutions and corruption affecting the development of the stock market in the EAP region (Phuong, 2020a, Phuong, 2020c). For enterprises, Phuong (2020b) found that low administrative procedure costs in Vietnam have a positive impact on helping businesses reduce time costs, but when total informal fees surpassing 10% of the sales of businesses, it becomes a burden for businesses and inhibits them from investing in the long term. This is an aspect of the direction to study the impact of corruption on business and production activities. In order to dig deeper into this research direction, a question arises is how does corruption affect the efficiency of firms' labor use? To answer this question, this article will examine the effects of corruption on labor efficiency in Vietnamese firms.

2. Research model and data

2.1 Research model

Based on previous studies, the article builds up the research model including the following variables:

The dependent variable (**ldhqua**): Labor efficiency reflects the efficiency of the firm's use of labor in terms of revenue generation of employees. Labor efficiency in operating enterprises is measured by the average net revenue per employee compared with the average income of an employee.

Explanatory variables: Many scholars have suggested different methods of measuring corruption variables. Phuong (2020a) uses time series data aggregated from The Worldwide Governance Indicators (WGI) to measure corruption to the development of East Asian and Pacific stock markets. This measurement method is suitable for research at the national level but very difficult to do at the provincial level within a country. Furthermore, for studies that use dummy variables from survey data at the provincial level in a country to measure corruption, the impact of corruption on firms will be inaccurate (Huong, Tuyen, Tuan, Steven, 2018). To overcome the limitations of dummy variables when using survey data, this article measures corruption based on the proportion of firm responses to each question. Four measures of corruption based on PCI survey results for 63 provinces in Vietnam from 2016-2018 are presented in Table 1. This method has been used in Phuong's study (2020b).

Table 1
Survey questions to measure corruption variables

	Question	% selection		Variables of corruption
1	Firms in the same industry often have to pay additional informal fees	Agree	⇒	Corruption in the industry (**kctnganh**)
2	Enterprises must spend more than 10% of their revenue on informal fees for state officials in business-related activities.	Agree	⇒	The burden of corruption in business (**Kctdthu**)
3	Unofficial fees related to general administrative procedures are acceptable	Agree	⇒	The cost of accelerating is acceptable (**kctok**)
4	The work is achieving the expected results after paying informal fees	As always, in most cases	⇒	Ability to predict corruption (**kctcvhqua**)

Source: Based on VCCI survey data from 2016-2018

Control variables: Fixed assets per employee (**fixasl**) reflect firm's ability to increase labor productivity. When included in the estimation model, the variable fixed assets for an employee is calculated by taking the logarithm of the average value of fixed assets per employee. The number of employees currently working (**Sold**) reflects the size of the firm (Phuong, 2020b). Number of employees working in enterprises over the years is converted to logarithmic form before being included in research models.

Return on equity - **ROE** reflects the profitability of equity in production and business. ROE is calculated by the ratio of pre-tax profit to the average total equity of the business. Control of the operating area of the enterprise (**TW**): businesses that are licensed to do business in central cities of Vietnam (Cantho, Danang, Haiphong, Hanoi, Ho Chi Minh City) receive 1, the rest of the provinces get 0.

Estimation method: Each corruption measure is used in a regression model. There are four regression equations used in this paper that correspond to the four measured corruption variables. Regression technique Generalized Least Square (GLS) was used to estimate the research models. The advantage of this estimation over the Fixed Effects Model, Radom Effects Model and Pool regression techniques for table data is that it overcomes the heteroskedasticity and series correlation phenomena that occur in the regression models.

2.2 Research data

The data set in this study were collected from a variety of sources. Enterprise data is selected from the Vietnam Business White Paper 2019 and 2020 announced by the Ministry of Planning and Investment and the General Statistics Office. Variables measuring corruption are based on the survey results in Vietnam's Provincial Competitiveness Index (PCI) conducted by VCCI in the period 2016-2018.

3. Results and discussion

Average income of employees increased 39.7% from 5.882 million VND in 2011-2015 to 8.217 million VND in 2016-2018 period. The growth rate of average revenue per employee in the 2016-2018 period compared to the 2011-2015 period is slower than the growth rate of average income per employee. Employee efficiency is calculated by average net revenue per employee divided by average income per employee. As a result, the employment efficiency of the period 2016-2018 reached 14.9 times, 15.5 times lower than that of the 2011-2015 period. Vietnamese businesses in the 2016-2018 period increased investment in fixed assets compared to 2011-2015. This is reflected in the average fixed asset equipment per employee increased from 242 million VND in the 2011-2015 period to 332.5 million VND in the 2016-2018 period, equivalent to an increase of 37.4%. Increased investment in fixed assets is one of the key conditions for businesses to increase productivity in the future. The average return on equity (ROE) of Vietnamese enterprises in 2018 was 7.6%, down from 9% in 2016 and 10% in 2018. This can be explained by the fact that 2018 pre-tax profit increased only 2.1% compared to 2017, but the total equity of the business and the equity ratio between these two years increased by 18% and 14.1%, respectively. However, in terms of the whole period 2016-2018, this indicator still increased slightly by 6.1% compared to the period 2011-2015 when it increased from 8.2% to 8.7%.

Table 2
Statistics of variables in the model by year and by period

	Unit	2016	2017	2018	Average 2016-2018	Average 2011-2015
Employee efficiency in operating businesses	times	14.4	14.7	15.3	14.9	15.5
Average fixed assets per employee	Triệu VND	298	338	357	332.5	242
Number of employees working	Million workers	14	14.51	14.82	14.45	10.95
Return on equity - ROE	%	9.0	10.0	7.6	8.7	8.2
Percentage of registered businesses operating in central cities	%	61.95	60.36	60	60.7	
Corruption in the industry (kctnganh)	%	64.2	58.3	54.7	59.1	57.3
The burden of corruption in business (Kctdthu)	%	10.4	10.5	8.4	9.8	9.2
The cost of accelerating is acceptable (kctok)	%	78.7	79.4	81.1	79.7	78.2*
Ability to predict corruption (kctcvhqua))	%	56	62.8	62.1	60.3	61.1

*Note: * is the average value from 2013-2015.*
Values are averages across 63 provinces in Vietnam.
The five cities directly under the central government of Vietnam include Hanoi, Hai Phong, Da Nang, Ho Chi Minh City, and Can Tho.
Source: Ministry of Planning and Investment - Vietnam Business White Book 2019, 2020; VCCI- Provincial competitiveness index from 2011 to 2018.

The average number of operating enterprises in the 2016-2018 period was 558,704, an increase of 47.8% compared to the 2011-2015 period. In 2016, 2017, 2018, the number of enterprises operating in Vietnam was 505,059 respectively; 560,413; and 610,637 businesses. In which, businesses operating in five big cities directly under the central government account for about 61% of the total number of businesses in 63 provinces. It shows that the central cities have great attraction to businesses in Vietnam. Compared to the period 2011-2015, the average values of corruption variables in the period 2016-2018 are all higher except for the variable measuring the ability to predict corruption which is slightly reduced. It shows that Vietnamese enterprises still suffer the effects related to corruption.

Corruption in the industry: Although the average industry corruption index of 63 localities is decreasing from 64.2% in 2016 to 54.7% in 2018, it has shown that the unofficial costs of the industry paid by enterprises are changing positively. However, this index for the period 2016-2018 was 59.1%, still higher than the average in the period of 2011-2015 of 57.3%. In the period 2016-2018, Ben Tre (2018) is the province where businesses have to pay the lowest unofficial fees in the industry compared to other provinces. In contrast, Ha Tinh (2016) is the locality where enterprises have to pay the highest unofficial fees in the industry compared to other provinces.

The burden of corruption in business: Although the burden of corruption tends to decrease from 2016-2018. However, when the average for the 2016-2018 period is calculated, the index is 9.8%, which is still higher than the average for the 2011-2015 period of 9.2%. In the period 2016-2018, Vinh Phuc was the province in 2017 with the lowest corruption burden index, Dien Bien in 2018 was the province with the highest ratio compared to the rest of the provinces. Survey results showed that 1% of enterprises

in Vinh Phuc were asked to spend more than 10% of their revenue on informal fees for state officials in business-related activities. The number of enterprises having to pay more than 10% of this cost for Dien Bien province in 2018 is 25.6%. The cost of accelerating progress is still increasing from 78.7% (in 2016) to 81.1% (in 2018). This leads to the average value of this indicator in the period 2016-2018 of 79.7%, still increasing compared to the period 2011-2015 of 78.2%. It shows that the proportion of enterprises willing to pay informal fees is on the rise in order to shorten the time involved in administrative procedures. The lowest proportion of firms in Cao Bang who accepted to pay informal fees (64.2%) and the highest proportion of firms in Phu Yen (94.2%) accepted to pay informal fees period 2016-2018.

Ability to predict corruption: Compared to the 2011-2015 period, the percentage of businesses achieving the expected results after paying informal fees is slightly decreasing compared to the 2016-2018 period. It shows that firms' ability to predict corruption is decreasing. In the period 2016-2018, Dong Thap's ability to predict corruption is lowest in 2017 and Lang Son's ability to predict corruption is highest in 2018.

Table 3
Correlation analysis

	Ldhqua	fixasl	roe	tw	kctnganh	kctdthu	kctok	kctcvhqua
Ldhqua	1.00							
Fixasl	0.27	1.00						
Sold	-0.12	-0.19						
Roe	0.31	-0.13	1.00					
Tw	-0.01	-0.06	-0.03	1.00				
Kctnganh	-0.15	0.11	-0.29	0.00	1.00			
Kctdthu	-0.21	0.15	-0.32	-0.13	0.45	1.00		
Kctok	0.25	-0.04	0.20	-0.03	-0.46	-0.39	1.00	
Kctcvhqua	-0.03	0.19	-0.11	0.03	0.22	0.18	-0.28	1.00

Source: Authors calculated from research data

Analysis of the correlation between the dependent variable and the corrupt one showed that only the accelerating variable was positively correlated while the rest of the corruption variables were negatively correlated. The correlation sign between the corrupt variables together, only the variable (kctok) is negatively correlated with the remaining corrupt variables. This result is a predictor of the direction of the impact of corruption variables on labor efficiency in firms. The correlation between the dependent variables and the control variables in the model has absolute value less than 0.33, the correlation value between the corrupt variables has absolute value less than 0.47, so all of the above variables are consistent. to include in the research model.

Table 4
Regression results

Variable	GLS1	GLS2	GLS3	GLS4
fixasl	3.74***	3.91***	4.05***	4.02***
Sold	-1.62***	-1.65***	-1.69***	-1.48***
Roe	0.25***	0.27***	0.27***	0.26***
tw	4.78***	4.62***	5.10***	4.41***
kctnganh	-5.13***			
kctdthu		-12.74***		
kctok			14.65***	
kctcvhqua				-2.51
_cons	13.45**	10.73**	-2.28	8.93**
Number of groups	63	63	63	63
Wald test	252.12	197.48	388.17	416.61
Prob > chi2	0.00	0.00	0.00	0.00

Source: Authors calculated from research data

Vietnam sets the minimum wage to be paid to employees and is classified by region. Therefore, when enterprises use more workers, they must weigh the revenue that employees earn for the company and the income that enterprises must pay for these workers. The regression coefficient of the labor variable is negative and has statistical significance of 1% in all four regression equations. It shows that the increase in the number of employees in the enterprise has a negative impact on the labor efficiency of the firms which is very consistent with the reality. This result shows that in the 2016-2018 period, when Vietnamese enterprises use more workers to exceed the efficiency threshold, the increase in labor will reduce the efficiency of using labor in enterprises. Because the growth rate of net revenue is lower than the growth rate of the total salary fund that the business must pay. This result complements Phuong's study (2020b) on the impact of the number of employees on the firm's performance.

The coefficient of the variable average fixed assets per employee is greater than zero and has a 99% confidence level. This result shows that firms that increase investment in fixed assets and modern equipment per employee will be the foundation for businesses to increase labor productivity and efficiency in employers. Enterprises focus on modernizing the state of equipment and applying

the advances of science and technology to production, contributing to creating a competitive advantage for businesses. This is demonstrated by increasing labor productivity with uniform and high quality products.

ROE: The profitability of equity has a positive impact on the efficiency of labor in the firm when the regression coefficient of this variable in the models is greater than zero and statistically significant. The regression coefficient of the variable (tw) is positive and has statistical significance of 1%, showing that it has an impact on the labor use efficiency of firms. Labor efficiency of businesses registered for business and operating in centrally-run cities is often higher than that of enterprises registered and operating in the remaining localities. This result is reasonable because when workers in large cities directly under the central government, they inherit favorable conditions such as market size, technical infrastructure and favorable conditions. others can assist in their own work.

Corruption in the industry: The regression coefficient of the variable “kctnganh” is negative with statistical significance of 1%. It shows that when other factors remain unchanged, corruption in the industry negatively affects the firm's labor efficiency. In other words, an increase in informal costs in the industry affects both mental and physical benefits for workers. It is these factors that will negatively affect the regeneration of labor and reduce the productivity of workers. The impact of sector corruption on Vietnamese firms' long-term investment has not yet been found (Phuong, 2020b), but the results of this study complement Phuong's (2020b) study on the impact of corruption in industry to effectively use labor in businesses.

The burden of corruption in business: With the statistical significance of 1%, it proves that the burden of corruption in business affects the efficiency of enterprises' labor use. The coefficient of the variable “kctdthu” is negative, showing that the efficiency of the firm's labor use is negatively affected by this corruption factor. In other words, when enterprises have to spend more than 10% of their revenue to pay for informal expenses, their financial resources for long-term investments will decrease (Phuong, 2020). On the other hand, the results of this study also show that the average fixed assets per employee positively affects labor use efficiency. Therefore, it can be inferred that the burden of corruption reduces the long-term investment of firms and leads to reduced labor efficiency.

The cost of accelerating is acceptable: Of the four corruption variables, only the regression coefficient of the variable “kctok” is greater than zero, indicating a positive effect of this variable on the dependent variable. With the statistical significance of 1%, it is proven that the cost of speeding up has a positive impact on the efficiency of the enterprise's labor use. Vietnamese enterprises consider unofficial fees related to general administrative procedures to be acceptable and they are willing to pay these costs to speed up the process and save waiting time. By saving time related to administrative procedures, the efficiency of labor use of enterprises increases. Thus, the cost of accelerating progress not only positively affects long-term investment of Vietnamese enterprises (Phuong, 2020b), but this study also found that it also positively affects the efficiency of labor use.

Ability to predict corruption: The regression coefficient of the variable “kctcvhqua” is negative but has no statistical significance. It turns out that there is not enough statistical basis to conclude that the ability to predict corruption has impact on labor efficiency.

4. Conclusions

This paper uses survey data on the business results of Vietnamese enterprises and their assessment expressed in the reports on the provincial competitiveness index, to study the effects of corruption on the efficiency of labor use in Vietnamese firms. After correcting problems such as variance change and autocorrelation, Generalized Least Square technique was used for estimation in research models.

Research results based on data from 63 localities in Vietnam show that corruption has a negative impact on the efficiency of employers. This negative effect is evident when the total unofficial costs that firms have to pay 10% or more of their revenue, including the unofficial costs in the industry. In addition, the majority of enterprises believe that informal fees related to administrative procedures are acceptable, they pay for it to save waiting time. As a result, the efficiency of enterprises using labor increases.

Besides the factor of corruption, the study also shows that a number of control variables in the model also affect the labor use efficiency of Vietnamese enterprises. The number of employees has a negative impact on the efficiency of enterprises' capital use. In contrast, equipping fixed assets per employee, the company's location of operations in centrally-run cities, and return on equity have a positive impact on efficiency of labor of the enterprise.

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