

PROVINCIAL COMPETITIVENESS AND LABOUR MARKET RETURNS IN VIETNAM*

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Abstract

This paper examines the relationship between the quality of provincial governance and labour market returns in Vietnam. We find that better provincial governance has a positive effect on labour market wages for wage-earning workers. The finding is consistent across estimators, even after controlling for worker characteristics, geographic regions, urban context, economic sector and industry type. A better competitive environment for business attracts more firms to enter the market, which in turn creates greater demand for labour. Subsequently, higher demand for labour pushes up wages. Our unique contribution is that we considered the influence of provincial governance on the business environment and labour market returns.

Keywords: economic transition, institutional competitiveness, labour market returns

JEL Classification Codes: J21, J24, J31, I26, L19, P23

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I. *Introduction*

A number of studies have examined how economic reform and the labour supply affect returns to education in Vietnam (see, for example, Doan and Gibson, 2012; Doan, Le and Tran, 2017). These studies have found that an opening market has helped improve labour market returns to education. This paper argues that a more integrated labour market, adjusted for education, would prove its value across regions and industries for workers seeking better-paid jobs (Campos and Jolliffe, 2003; Yang, 2004). Moreover, returns are determined by interactions among supply factors, such as the relative supply of skilled workers, and demand factors, such as skills requirements due to technological change (Katz and Autor, 1999; Heckman, Lochner and Todd, 2003).

In well-functioning economies, that is, competitive economies, changes in labour market returns may be due to fluctuations in the supply and demand for skilled labour. Higher labour market returns mean that workers are better paid for the higher productivity of their work (Mincer, 1974; Becker, 1975). In a more competitive market, education and skills are expected to yield higher rewards. In Vietnam, however, a high degree of economic policy distortion shows a heavy biased favouring state-owned enterprises (SOEs) (IMF, 2012).

Local institutions or bureaucratic administration may affect labour market returns to skills. The local business environment, that is, local competition, may influence a firm's decision regarding investment and where to start up a business. A better business environment would attract more firms to invest in given areas and thus the demand for labour would increase. Fiercer business competition requires firms to reduce costs and make use of advanced technology and innovation by employing a higher-skilled workforce. Workers would therefore be paid higher wages, due to higher demand for their skills (Griffith, Harrison and McCartney, 2007; Guadalupe, 2007).

In our study, we will make use of variations across provinces as well as within each province in the level of competitiveness to examine how these variations affect labour market wages. In provinces where competition is greater, that is, where there is a higher provincial competitiveness index (PCI), an easier business environment enables more firms to enter the market, creating a higher demand for labour and pushing wages higher. Our hypothesis is that provinces where more firms invest, thanks to a more competitive environment, there tends to be higher returns to skill and education because the demand for employment is higher. Thus, when we control for education as a proxy for skill, the returns are expected to be higher for the same education level in provinces where the business competitiveness environment is better.

In Vietnam, there exists competition among the provinces to attract investment. Apart from common policies and regulations from the central government, each province has its own policies and administrative procedures (Tran, Tran, Pham and Vu, 2018). To attract more investment, some provinces offer favourable conditions, such as 'red carpet', 'one door one stamp', or 'one stop shop.' We note a variety of policies: offering business support, ease of market entry or ease of business setup, lower entry costs, easier access to land and security for business premises, a transparent business environment and business information, free of informal charges, shorter time requirements for bureaucratic procedures and inspections, a fair competitive environment, proactive and creative provincial leadership for solving problems for enterprises and fair and effective legal procedures for dispute resolution.¹ These variations in

business policies across provinces enable us to examine how provincial competitiveness affects labour market returns.

To the best of our knowledge, there is no study on the effect of provincial institutional competitiveness on labour market returns in Vietnam and probably elsewhere. This paper is the first, offering at least two novel contributions to the literature. First, it provides the first evidence of how local competitiveness affects labour market returns. Secondly, it sheds light on how local government policies play an important role in improving workers' wellbeing through generating a better competitive environment for businesses. In the next section, we review the literature. Section 3 presents the data and econometric model specifications. Section 4 presents the results. The conclusion and discussion are given in Section 5.

II. *Literature Review*

There are two main approaches to labour market returns. One is to examine industry differences to explain wage differentials across industries, while the other is to consider the role of market competition on labour market returns. Industry wage differentials, may be attributed to industry characteristics, but is also found among equally skilled workers in different industries. After controlling for measured and unmeasured labour quality, working conditions, transitory demand shocks, threat of unions and bargaining power, firm size and other factors, wage differentials remain.

In order to retain their best workers, reduce turnover and associated costs and provide greater motivation for workers to increase their efforts, firms offer incentives (Krueger and Summers, 1988). Even after controlling for a wide range of individual characteristics and geographic location, substantial wage differentials are still observed and can be explained by industry differences (Dickens and Katz, 1986). Among all the attributes these researchers used in their models, only industry average education and industry profitability had the same positive effect on workers' earning in all model specifications in every study they reviewed. As a proxy for workers' skill, education is always related to higher wage rates. Dickens and Katz (1986) found that industries paying higher wages had a lower quit rate, higher labour productivity, longer working hours, more educated workers, larger establishment firms, higher concentration ratios and were more profitable. This suggests that market power and rent-sharing, as well as the higher opportunity cost of job loss and worker loyalty, all play a role in wage rates.

The second approach states that greater market competition leads to higher labour market returns as firms look for more productive workers to improve production efficiency. Stronger competition for more productive workers results in higher labour market returns. If the labour market is perfectly competitive, firms take wages as given by the market (Nickell, 1999). Competition theory states that in a perfectly competitive labour market, workers only accept jobs in which they expect to receive compensation equal to their opportunity cost. Firms pay a wage that is just sufficient to attract workers of the quality firms want. Without rent-sharing, monopoly power in the product market has an adverse effect on labour market returns. That is, less competition in the product market is linked to lower wage rates because firms have the ability to determine labour market wage rates. In addition, without collective bargaining, the

¹ http://vccineews.com/news_detail.asp?news_id=34029

overall rise in market power throughout the economy will lead to lower wages (Nickell, 1999). However, Nickell also found evidence that product market power firms also share monopoly rent with their workers.

Moreover, efficiency wage theory suggests that there are important variations in wages which cannot be explained by the standard competition theory (Stiglitz, 1984, Krueger and Summers, 1988). The wage efficiency theory presents some key arguments for higher wage rates: (i) there are incentives for firms to raise wages in order to minimize worker turnover costs; (ii) increasing wages would raise workers' effort level because firms may make the cost of job loss greater for workers, thus encouraging workers to work harder; (iii) workers may be more loyal to firms if the firms share profits with their workers. This is quite common in Asian firm culture and; (iv) firms paying higher wages may attract a higher quality pool of applicants when they advertise job vacancies. These factors may not derive directly from the power of market competition but may constitute the indirect result of the competitive business environment. In short, the literature does not conflict with the competition theory.

Many studies suggest that increasing market competition will increase employment, and then higher employment will lead to higher wages (Dixit and Stiglitz, 1977; Blanchard and Kiyotaki, 1987; Griffith, Harrison and McCartney, 2007). The impact of market regulations on employment and wages has been thoroughly examined (see, for example, Fonseca, Lopez-Garcia and Pissarides, 2001; Bertrand and Kramarz, 2002; Kugler and Pica, 2003; Griffith, Harrison and McCartney, 2007). They found strong evidence that reforms easing access to the market decrease the average level of profits in the economy and increase employment and real wages.

A study of OECD economies shows that market reforms, labour reform, easing market entry and the business environment benefit workers through increased employment and real wages (Griffith *et al.*, 2007). Guadalupe (2007) also found that returns to skill within an industry increase with competition. Increased competition leads to changes in trade union bargaining and more investment in skill-biased technologies, that is, innovation to keep ahead of rivals, and improvement in the efficiency of organizational structure (Boone, 2000). Higher market returns to skills result from higher investment in more advanced technologies, innovation and rent sharing or profit distribution. When the product market is more competitive, profitability is more sensitive to costs. Firms then seek out more productive workers possessing higher skills to reduce production costs because higher-skilled workers produce at lower cost. Firms compete with each other to attract higher-skilled workers and thus the returns to skills increase.

The effect of product competition on wages is influenced by bargaining power (Blanchard and Giavazzi, 2003; Griffith *et al.*, 2007). However, where the market is more developed or more competitive, trade union bargaining or the influence of public administration on wage setting would be weaker (Card, 1996). Competition promotes technological change towards technologies favouring skills leading to higher demand for a better-skilled managerial workforce relative to an unskilled workforce (Aghion, Bloom, Blundell, Griffith and Howitt, 2005). This situation generates a larger wage gap or higher returns to skills. Ultimately, firms aim to lower costs and increase profits. More efficient firms often lead in innovation and investment in advanced technologies. An increase in demand for skills in the labour market results in higher compensation for skills. When Guadalupe (2007) studied the effect on labour market returns of reducing market entry barriers in Europe in the early 1990s, she found that reducing barriers increased market competition and skills were better rewarded.

In our paper, we assume that real wages are independent of union bargaining power because there is a single trade union in Vietnam established and controlled by the Communist Party government. This trade union does not support workers but cooperates with employers to counter or prevent workers' strikes (Schweisshelm, 2014). There are no independent unions in Vietnam² so that the effect of competition, if any, on real wages is not influenced by the power of a trade union.

III. *Data and Model Specification*

1. **Data**

Data used in this paper are from two sources. The first data source is from the Vietnam Provincial Competitiveness Index (PCI), which has been compiled annually since 2007 by the Vietnam Chamber of Commerce and Industry (VCCI) with support from USAID.³ The survey covers all 63 provinces of Vietnam. The provincial competitiveness index (PCI) comprises an annual business survey, assessment and ranking of the quality of economic governance by the provincial authorities in creating a favourable business environment for the development of the private sector in Vietnam (Tran, Vu, Doan, and Tran, 2016). The PCI is made up of 10 sub-indices below, reflecting areas of economic governance that affect the development of the local private business sector. The indices include:

- (1) Market entry costs for business start-ups;
- (2) Access to land and security of business premises;
- (3) A transparent business environment and equitable business information;
- (4) Informal charges;
- (5) Time requirements for bureaucratic procedures and inspections;
- (6) Restrictions on the marginalisation of private activity due to policy biases toward state-owned or foreign-owned businesses;⁴
- (7) Proactive, creative provincial leadership in problem solving for businesses;
- (8) Business support services;
- (9) Labour training policies and regulations, and
- (10) Fair and effective legal procedures for dispute resolution.

The sub-indices are computed based on the annual business survey⁵ and published data sources assessment and ranking of the quality of economic governance by provinces. Each sub-index is standardized on a 10-point scale, that is, ranging from zero to ten, the best or highest score is 10. Overall PIC is calculated as the weighted mean of sub-indices with a maximum score of 100 points. Provinces with higher PCI, are more competitive than others. The PCI data is structured by province and year, that is, it varies across provinces and across years.

² <https://www.bna.com/vietnam-move-independent-n73014462774/>

³ For the sampling and methodology of the survey, see http://eng.pcivietnam.org/uploads/96646-PCI%20USER%20GUIDE_Final_Website.pdf

⁴ This sub-index was not collected in 2012 and earlier years.

⁵ Questionnaire is available here <http://eng.pcivietnam.org/danh-muc-an-pham/phieu-khao-sat/>

TABLE 1. CORRELATION BETWEEN SUB-INDEX AND PCI

Entry Cost	Land Access	Transparency	Time Cost	Informal Charge	Pro-active	Business Support	Labour Training	Legal
0.116*	0.137*	0.640*	0.611*	0.184*	0.559*	-0.050	0.706*	0.391*

Notes: * Statistically significant at the 5% or lower level.

The second data source is from the Vietnam Household Living Standards Survey (VHLSS), conducted biennially by the General Statistics Office of Vietnam (GSO). These VHLSS data consist of around 9,300 households. The surveys offer a very large sample of about 119,200 working age (15-60 years old) household members, from which a sub-sample of 38,389 wage-earners is used in the estimation. Each round of the survey has between 7,000 and 8,300 wage-earner observations. The proportion of wage earners in the working age sample ranges from about 29 percent in 2008 to 38 percent in 2016. A consistent method of randomly stratified sampling of the records from each survey makes the data comparable across years and samples are representative for the national population of Vietnam (see Doan, Le, and Tran, 2017). We use the average hourly wage rate from the first and second jobs (if a worker has two wage-earning jobs) as the labour market wage rate.

We use data from the VHLSS 2008, 2010, 2012, 2014 and 2016 and merge them with the even-year PCI data in estimation using province and year as identification. In the lagged model specifications we employ the PCI of odd years as lagged values of the even-year PCIs.

As there are positive correlations between a PCI sub-index and overall PCI (see Table 1), we only run regressions for overall PCI. The correlation between “business support” and overall PCI is negative and insignificant at the five per cent level but the correlation is mainly driven by data of the 2010 survey. We tried to look for information from the PCI/VCCI’s reports, survey and any other notes, even we contacted the VCCI with the hope that we can justify for the unexpected relationship. Unfortunately, no information is available and no response from them. Assuming that the data “business support” is free of issue, then our assumption would be that poor quality of “business support” services would be the reason, the business environment or provincial competitiveness therefore has not received any benefit from symbolized “business support” that was offered by local governments. We also made effort to find evidence from existing studies and reports to assert the claim. Unfortunately, there exist no evidenceso we should not make any strong claim in our paper. Rather in the modelling sectionpresented later, in order to test the robustness of the results, we will also estimate models with “adjusted PCI”, that is, overall PCI without the ‘business support’ sub-index.

2. Estimation Methods

To estimate the effect of provincial competitiveness on labour market returns, we start with the Mincerian earnings equation (Mincer, 1974) with an extension to include individual characteristics, PCI and other controlling variables as follow:

$$\ln Y_{ijt} = \alpha + \beta_1 X_{ijt} + \beta_2 Z_{ijt} + \beta_3 PCI_{jt} + year_t + \epsilon_{ijt} \quad (1)$$

where $\ln Y_{ijt}$ is the natural logarithm of hourly wage income, including bonuses, allowances, and subsidies (both in cash and in kind) of individual i in province j and year t . X_{ijt} is a vector

of individual characteristics, such as year of education, years of work experience or potential experience (calculated as age *minus* schooling years *minus* six), experience squared term to allow for a non-linear pattern in lifecycle earnings, gender, and ethnicity. Z_{ijt} is a vector of variables to control for differentials in individual earnings attributable to economic sector (state vs. non-state), eight geographic regions, urban-rural, and 20 one-digit industries. The variable of interest is the provincial competitiveness index (PCI_{jt}), varying across 63 provinces and across years, and the error term (ε_{ijt}). Estimation of equation (1) is by ordinary least squares (OLS) for pooled cross-sectional data across years. Since we use nominal wages, we control for (*year*) year dummies to capture the time effect, including inflation in wage rates. The year dummy controlling is also to capture other external shocks over time e.g. minimum wage changes, natural disasters etc. We control for 20 one-digit industry dummies to capture the earnings differentials across industries as well discussed in the literature.

If we consider a province as a firm, then provincial competitiveness would influence business investment decisions as well as attracting more productive workers to the province to live and work and also affecting labour market returns. Since each region will have its own advantages e.g. natural advantages, attracting firms to invest and workers to live and work, we need to control for regional dummies, where provinces within a region may have fewer differentials. For example, provinces in the Highlands region differ considerably from those in the Southeast region in terms of transportation costs and socio-economic conditions. Within a region, however, provinces are rather similar, so that they are more likely to compete directly with each other to attract more business and investment.

Some industries pay their workers more than others, even after controlling for workers' observed characteristics. This suggests imperfect competition in the labour market (Martins 2004). There is evidence that higher ability workers are over-represented in high wage industries. The inter-industry wage difference is often attributed to characteristic industry differentials, differences in required skillsets or occupations, and rent-sharing (Dickens and Katz, 1987; Dickens and Katz, 1992; Neal, 1998; Gibbons, Katz, Lemieux and Parent, 2005). We therefore need to control for industry dummies to capture industry wage differentials as well as the effect of across industry competition on wage rates.

Our key variable of interest is PCI. Potential bias may arise from PCI endogeneity; that is, some potential factors may affect both PCI (X) and wages (Y). These include, for example, the level of provincial labour market development, economic activities, the economic advancement of the provinces, the tendency of higher skilled or more dynamic workers to move to provinces where there is a better business environment, a less bureaucratic administration, higher demand for labour and higher pay rates.

Another issue which may cause the biased estimate of the effect is that some provinces may have better PCI because higher skilled (or better educated) employees who earn higher wages, these higher earning workers (also local residents) and their employers may put higher pressure on local government to improve their administration procedures and business environment. In this case, there may be potential biases due to reverse causality, that is, higher wages result in better PCI.

To address these biases, we will employ lagged specification models where we run a regression of current wage rates on provinces' lagged PCI, and time-differenced specifications in which we consider the effect of variation in PCI on variation in wage rates within a province over time. However, we have data on the VHLSS only for even years, we are thus not able to

use the first-differenced specification model. We will therefore make use of two-year differenced or second-differenced models.⁶

The lagged model specification is:

$$\ln Y_{ijt} = \alpha + \beta_1 X_{ijt} + \beta_2 Z_{ijt} + \beta_3 PCI_{jt-1} + year_t + \varepsilon_{ijt} \quad (2)$$

where PCI_{jt-1} is the one-year PCI lagged value of province j in year t . Because we have all-year PCI for each province from 2007 to 2016, we will not lose any data for wages and PCI in any year. For example, for 2008 data the lagged PCI is the PCI of 2007.

The time-differenced model specification is:

$$\Delta \ln Y_{ijt} = \alpha + \beta_1 \Delta X_{ijt} + \beta_2 \Delta Z_{ijt} + \beta_3 \Delta PCI_{jt} + year_t + \Delta \varepsilon_{ijt} \quad (3)$$

As discussed earlier, we do not have odd-year data for the VHLSS, so in equation (3) we use a two-year differenced specification. Estimates (1) and (2) capture the effect of PCI (or lagged PCI) on wage income, while estimate (3) captures the effect of change in provincial PCI on change in labour market returns. In equation (3), we can also use the time difference of the first PCI lag to avoid reverse causality. Equation 3 can be modified into specification (4):

$$\Delta \ln Y_{ijt} = \alpha + \beta_1 \Delta X_{ijt} + \beta_2 \Delta Z_{ijt} + \beta_3 \Delta PCI_{jt-1} + year_t + \Delta \varepsilon_{ijt} \quad (4)$$

where $\Delta PCI_{jt-1} = PCI_{t-1} - PCI_{t-3}$

It should be noted, as mentioned earlier, that since the VHLSS repeated sample size is relatively small, the sample will shrink considerably and may result in less accurate estimates. Instead, we modify the time-differenced specifications (3) and (4) as in (5) and (6):

$$\Delta \ln Y_{ijt} = \alpha + \beta_1 X_{ijt} + \beta_2 Z_{ijt} + \beta_3 \Delta PCI_{jt} + year_t + \varepsilon_{ijt} \quad (5)$$

$$\Delta \ln Y_{ijt} = \alpha + \beta_1 X_{ijt} + \beta_2 Z_{ijt} + \beta_3 \Delta PCI_{jt-1} + year_t + \varepsilon_{ijt} \quad (6)$$

In addition, we also can use a fixed effect (FE) model to control for time invariant unobserved heterogeneity and remove the unobserved heterogeneity bias, but again the limited overlap of the sample over time restricts our operation. Only 19.2 percent of the sample was repeated in three surveys, 22.5 percent of the sample was repeated in two surveys, only a few observations were repeated in all four surveys, and no observations were repeated in all rounds of the survey (see Table 2). Intuitively, we do not have good panel data for applying the FE model.

In addition, with a closer look to data structure (see Appendix 1), we see that only roughly about 13% of the wage earning sample were repeated in two or more consecutive rounds of the VHLSS survey, so we do not have a good (even unbalanced) panel to apply panel models in this case.

Given the limitedly repeated wage earning observations over 5 rounds of the VHLSS survey, the panel methods such as Random Effect or Fixed Effect therefore is no longer appropriate in our case. McKenzie (2012) implies use of a more suitable method of ANCOVA to a short panel with low autocorrelation. He indicated that improvement in power of estimation

⁶ However, since the VHLSS sample repeated across years is quite small, this may affect the significance of the estimates in the time-differenced specification modelling.

TABLE 2. REPEATED SAMPLES ACROSS YEARS FOR WAGE EARNERS AGED 15-60

Repetitions	Observations	Percent	Cumulative
1	22,384	58.31	58.3
2	8,623	22.46	80.8
3	7,375	19.21	99.9
4	7	0.02	100.0
Total	38,389	100.00	

Source: VHLSS 2008, 2010, 2012, 2014 and 2016

by ANCOVA is greater when the baseline or lagged data (outcomes) have little predictive power for future outcomes. ANCOVA implies controlling for the lagged value of the outcome variable in the regression rather than differencing it out in the more common methods such as difference-in-difference or time-differenced specification. The ANCOVA estimates will be added to consolidate our finding.

IV. Estimation Results

First, we provide some basic information about key variables we use in the estimation. The weighted means of some key variables are presented in Table 3. The table shows stable values across surveys, except the nominal household non-wage income and hourly wage rates, due to relatively high inflation in the country and real wage growth. It also shows that the wage earning population is growing, due to the rapid transformation of Vietnam's economic structure. Over the study period, there was an overall improvement in PCI from 56 to about 60 (Table 4).

The pooled PCI data show that some provinces have high PCI scores while a few provinces are skewed to the left of the score distribution (Figure 1 and Table 5). Some provinces improved their scores even these provinces' PCI remained relatively lower than those of others (Table 5).

We apply the OLS estimator in Table 6. In the first column, we estimate the effect of PCI on labour market returns (measured in the hourly wage rate) using current year PCI data. After controlling for time, regional, and industry dummies, we observe that PCI has a positive and highly statistically significant relationship with labour market returns. Each percentage increase in the provincial competitiveness index results in about a 0.72 percentage point increase in a worker's wage rate, keeping other things constant. Other variable coefficients are expected and highly statistically significant. For example, males earn approximately 16.4 percent more than female workers, urban workers earn about 14.3 percent more than their counterparts in rural areas, and the state sector pays workers about 8% higher premium than does the non-state sector. This finding is consistent with Doan *et al.* (2017).⁷

To avoid reverse causality bias, instead of the current PCI we use the first lagged PCI, which in fact is the PCI of the odd years. That is, we link data from the VHLSS of even years with the PCI of previous odd years. Specifically, we link worker information, including income

⁷ Bear in mind that the coefficient of school year here is not comparable to the results of Doan *et al.* (2017), because controlling for industry dummies has removed some of the effect of education on earnings (see Psacharopoulos and Patrinos 2004).

TABLE 3. WEIGHTED MEANS OF KEY VARIABLES FOR THE WAGE-EARNING SUBSAMPLE

Year	Sex (M=1)	Age	Ethnicity (Majority=1)	Exp (Year)	Education (Year)	Household Size	Non-Wage Income	Hourly Wage	State Sector	Wage- Earners' Share
2008	0.60	33.5	0.944	15.8	10.6	5.3	31,111	10.45	0.319	0.29
2010	0.60	33.8	0.929	16.4	10.1	4.9	25,474	13.55	0.272	0.31
2012	0.59	34.3	0.929	17.1	9.4	5.0	27,018	14.89	0.250	0.34
2014	0.58	34.7	0.923	16.8	10.4	4.9	27,558	17.07	0.260	0.37
2016	0.57	35.1	0.904	17.3	10.8	4.9	32,947	19.34	0.232	0.38

Sources: VHLSS 2008, 2010, 2012, 2014 and 2016. Notes: Income variables are measured in VND1,000; non-wage income is annual household non-wage income, both wage and non-wage income was deflated to 2008 price; average exchange rate (USD/VND) was 16,481 in 2008; 18,983 in 2010; 20,919 in 2012; 21,259 in 2014; and 22,750 in 2016.

TABLE 4. WEIGHTED MEAN OF PCI SUB-INDICES FOR WAGE-EARNING SAMPLE

Year	Entry Cost	Land Access	Trans- parency	Time Cost	Informal Charge	Proactive	Business Support	Labour Training	Legal	PCI
2008	8.17	6.46	6.42	5.42	6.67	5.87	7.31	4.93	4.64	56.1
2010	6.55	5.56	5.91	6.27	6.31	5.00	6.19	5.57	5.15	58.7
2012	8.66	6.34	5.87	5.82	6.55	4.65	4.26	5.22	3.65	57.9
2014	8.10	5.64	6.21	6.46	5.10	4.39	5.93	6.24	5.62	59.3
2016	8.34	5.58	6.27	6.47	5.23	4.75	5.82	6.44	5.22	59.8

Sources: PCI 2008, 2010, 2012, 2014 and 2016

FIGURE 1. PCI DISTRIBUTION OF EVEN-YEAR POOLED DATA 2008-2016

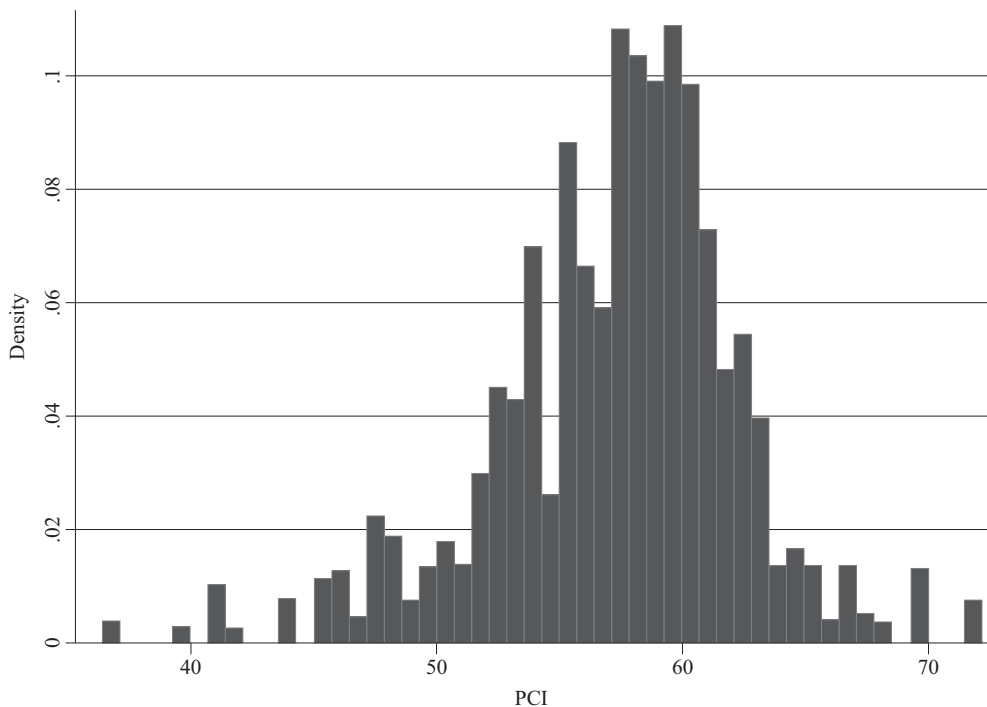


TABLE 5. TOP PROVINCES AND GREATEST IMPROVEMENT

Top 10 Provinces in 2016	PCI	Top 10 Provinces Improvement between 2008-2016	Percent Improvement in PCI
Quang Nam	61.2	Thanh Hoa	27%
Vinh Phuc	61.5	Cao Bang	29%
HCM city	61.7	Quang Binh	30%
Thai Nguyen	61.8	Dak Nong	31%
Vinh Long	62.8	Tay Ninh	33%
Lao Cai	63.5	Kon Tum	34%
Binh Duong	63.6	Thai Nguyen	34%
Đông Thap	65.0	Bac Kạn	37%
Quang Ninh	65.6	Bạc Lieu	41%
Da Nang	70.0	Dien Bien	55%

data for 2008 (VHLSS2008) with the PCI of 2007 (PCI2007), VHLSS2010 with PCI2009, VHLSS2012 with PCI2011, VHLSS2014 with PCI2013, and VHLSS2016 with PCI2015. In this way, we not only address the issue of reverse causality but also maintain sample size.

The results can be seen in column 2 of Table 6. The results are consistent with those in column 1, regardless of very small changes in estimated coefficients. Again, the estimate confirms the positive and statistically significant connection between local competitiveness and labour market returns.

In column 3, we use the second lagged PCI (PCI_{t-2}) to avoid the reverse causality bias of PCI on wage rates, as discussed earlier, since we have a limited overlapping sample across rounds of the VHLSS survey. Using the second lagged PCI caused a large loss in sample sizes (the sample size reduces by about 75% (from 36,683 to 9,046 observations). All the estimated coefficient of PCI is still positive and expected but its significance is lost, due to the substantial shrinkage of the sample. Our estimates become in this specification less representative for the population.

In column 4 of Table 6, apart from an individual's fixed variables over time, such as gender and ethnicity, we checked other variables to see if there was a shift across two consecutive survey years. We noted that there was little change between two consecutive survey years for the urban, sector, one-digit industry and region variables. We therefore treat these variables as fixed over the two consecutive surveys. Since the two-year difference of these variables will be zero, we remove them from the model specification in column 4, but we leave these variables in the specification in column 5. The sample size shrinks significantly to about 6,600 observations, which is relatively small compared with those in columns 1 and 2. The effect of PCI on wages is still positive but becomes much smaller, just about one third of the coefficient magnitude in column one, and statistically insignificant. Again, this estimate is less representative for the population, due to the major drop in sample size.

All the estimates confirm a positive and statistically significant relationship between local competitiveness and labour market returns. The better business environment attracted more investment and firms, in turn generating higher demand for labour and exerting pressure to increase wages. The 2016 PCI report by a research group at the PCI agency⁸ shows that there is

⁸ http://eng.pcvietnam.org/uploads/84281-Ho%20so%2063%20tinhh_%20final.pdf

TABLE 6. CROSS-SECTIONAL, LAGGED AND TIME-DIFFERENCED MODEL ESTIMATES

Variable	Current PCI	First Lagged PCI	Second Lagged PCI	Two-Year Differenced	Two-Year Differenced
PCI	0.0072** (0.001)				
PCI _{t-1}		0.0088** (0.001)			
PCI _{t-2}			0.0032 (0.002)		
Δ ₂ PCI				0.0026 (0.002)	0.0026 (0.002)
Δ ₂ Schoolyear				0.0240** (0.004)	0.0238** (0.004)
Δ ₂ Experience				0.0319** (0.006)	0.0327** (0.006)
Δ ₂ Experience squared				-0.0006** (0.000)	-0.0006** (0.000)
Δ ₂ Urban					0.0923 (0.101)
Δ ₂ Sector					0.0085 (0.039)
Urban (urban=1)	0.1431** (0.011)	0.1427** (0.011)	0.1337** (0.020)	-0.0388* (0.016)	
Sector (state=1)	0.0813** (0.016)	0.0800** (0.016)	-0.0150 (0.030)	-0.0249 (0.031)	
School year	0.0528** (0.002)	0.0528** (0.002)	0.0510** (0.002)		
Experience	0.0386** (0.001)	0.0386** (0.001)	0.0426** (0.003)		
Exp squared	-0.0008** (0.000)	-0.0008** (0.000)	-0.0009** (0.000)		
Gender (male=1)	0.1643** (0.008)	0.1648** (0.008)	0.1547** (0.015)	-0.0125 (0.017)	
Ethnicity (majority=1)	0.0343* (0.016)	0.0321* (0.016)	0.0483+ (0.029)	0.0072 (0.027)	
Constant	0.6332** (0.057)	0.5251** (0.054)	1.3598** (0.134)	0.0432** (0.040)	0.1125** (0.017)
Observations	36,683	36,683	9,046	6,592	6,592
R-squared	0.405	0.406	0.354	0.032	0.022
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: Robust standard errors in parentheses (corrected for sampling weights and clusters), statistically significant at 10% (+), at 5% (*), and at 1% (**); dependent variable is log of hourly wage. Hourly wage is measured in VND 1,000 (and for all tables hereafter). We also controlled for 8 geographic regional dummies, 20 one-digit industry dummies, and year dummies in all models. Δ₂ is two-year differenced or second-differenced.

strong evidence of the relationship, statistically highly significant, between quality of governance, or PCI, and private sector development. Accordingly, a one-point increment in PCI results in a 2.7 percent increase in newly established firms. A one-point increase in access to land or to labour training leads to a 12 percent increase in newly registered firms. The research also shows that in the longer term of the next 10 years, each point of increase in PCI would result in a 15 percent increase in the number of newly registered firms. Improvement in labour

TABLE 7. ESTIMATES OF THE EFFECT OF PCI ON LABOUR MARKET RETURNS WITHOUT SUB-INDEX OF “BUSINESS SUPPORT”

Variables	OLS	OLS
PCI adjusted	0.0050** (0.001)	
PCI adjusted (one year lagged)		0.0051** (0.001)
School year	0.0528** (0.002)	0.0529** (0.002)
Experience	0.0386** (0.001)	0.0386** (0.001)
Experience Squared	-0.0008** (0.000)	-0.0008** (0.000)
Gender (male=1)	0.1644** (0.008)	0.1647** (0.008)
Ethnicity (majority=1)	0.0368* (0.016)	0.0360* (0.016)
Urban (urban=1)	0.1458** (0.011)	0.1470** (0.011)
Sector (state=1)	0.0809** (0.016)	0.0800** (0.016)
Constant	0.7846** (0.054)	0.7598** (0.056)
Observations	36,683	36,683
R-squared	0.4040	0.4041
Prob>F	0.0000	0.0000

Notes: Robust standard errors in parentheses (corrected for sampling weight and clusters), statistically significant at 10% (+), at 5% (*), and at 1% (**); dependent variable is log of hourly wage. We also controlled for 8 geographic region dummies, 20 one-digit industry dummies, and time (year) dummies in all models.

training and a higher demand for labour, due to more new firms being established, would ultimately push up wages in the labour market.

1. Robustness Test

In this sub-section, we remove the sub-index of ‘business support’ from the overall PCI in light of the earlier discussion, that the correlation between this sub-index and overall PCI is unexpectedly negative; the negative relationship was found only in the 2009 and 2010 data.⁹ We therefore remove this sub-index, in the expectation that we are left with purer PCI data, labelled ‘PCI adjusted’. After excluding the sub-index of “business support” from overall PCI, we re-ran the regression with the first two model specifications as in Table 6. We only replicate estimations with the estimators that are appropriate to our data structure. Accordingly, we present only the results from the OLS, OLS with lagged PCI. Although the estimated coefficients are lower than the counterpart estimates in Table 6, the estimates in Table 7 are still highly statistically significant. Moreover, all other estimated coefficients of the variables are highly statistically significant and expected.

⁹ We contacted the VCCI for clarification but unfortunately received no response from them

TABLE 8. ANCOVA ESTIMATES OF THE EFFECT OF PCI ON LOG HOURLY WAGE INCOME

	(1)	(2)
Two year lagged	0.4668**	0.4670**
log of hourly wage income	(0.010)	(0.010)
PCI	0.0062**	
	(0.002)	
PCI _{t-1}		0.0051**
		(0.002)
School year	0.0245**	0.0245**
	(0.002)	(0.002)
Experience	0.0189**	0.0188**
	(0.002)	(0.002)
Experience squared	-0.0004**	-0.0004**
	(0.000)	(0.000)
Gender (male=1)	0.0813**	0.0816**
	(0.011)	(0.011)
Ethnicity (majority=1)	0.0102	0.0128
	(0.022)	(0.022)
Urban (yes=1)	0.0439**	0.0457**
	(0.011)	(0.011)
State sector (yes=1)	0.0336+	0.0322+
	(0.019)	(0.019)
Observations	6,652	6,652
Adjusted R-squared	0.5127	0.5126
Prob>F	0.0000	0.0000

Notes: Standard errors in parentheses, statistically significant at 10% (+), at 5% (*), and at 1% (**); dependent variable is log of hourly wage. We also controlled for 8 geographic region dummies and 20 one-digit industry dummies, and time (year) dummies in all models.

2. ANCOVA Estimation

We now employ ANCOVA method (see McKenzie, 2012) instead of time-differenced (two-year differenced) specifications. The model specifications are similar to those in columns 1 and 2 of Tables 6 with two-year lagged outcome value on the right hand side of the model.

The results of ANCOVA estimation (Table 8) are consistent with those in Tables 6 and 7. The sample size of both the ANCOVA estimation with two-year lagged outcome value on the right hand side of the model and the two-year differenced specification shrink significantly to about the same number of observations (about 6,600), but the power of ANCOVA estimation is much greater than the time-differenced specifications (comparing R squared and significance of PCI coefficients in columns 1 and 2 of Table 8 with those of columns 4 and 5 of Table 6).

Overall, all the results in three tables 6, 7 and 8 show a positive and statistically significant relationship between PCI and labour market returns regardless of some variations in the magnitude of the estimated coefficient of PCI due to variations in sample size.

V. *Conclusions and Discussion*

In this paper, we estimate the relationship between provincial competitiveness and labour market returns in Vietnam, using updated, large-scale, nationally representative data from five rounds of the Vietnam Household Living Standards Survey (2008, 2010, 2012, 2014 and 2016) in combination with the PCI data from the VCCI's provincial competitiveness surveys.

We find that local provincial competitiveness has a positive, statistically significant influence on labour market wages for wage-earning workers. The finding is consistent across the pooled OLS, lagged model, and ANCOVA estimators, even after controlling for worker characteristics, such as gender, education, ethnicity, and work experience; for location, such as geographic region, and urban-rural; and for sector attributes, such as economic sector and industry type.

Each province offers different business environments where firms can invest. A better business environment is believed to attract more firms and their investment, which in turn create greater demand for labour. Higher demand for labour pushes wages to a higher level. Our finding is congruent with the literature on competition and labour market returns (Nickell, 1999; Griffith *et al*, 2007; Guadalupe, 2007). However, our unique contribution is that we have examined the effect of local competitiveness or local institutional competitiveness on labour market returns via business environment.

Our findings suggest that the local competitiveness favours and improves the business environment by simplifying administration procedures with the aim of reducing costs for business start-ups, providing easy access to land and the security of business premises and supplying transparent business-related information so that businesses can minimize informal charges and time requirements for bureaucratic procedures and inspections. Good administration ensures fair competition between businesses, provides efficient business support, quality labour training, and effective legal procedures for dispute resolution. All these measures will help improve business competition environment, create more jobs for workers and increase their incomes. Better business competitiveness not only helps business and local economy's growth (Nguyen, Mickiewicz and Du, 2017) but also improves workers' income. Better provincial competitiveness positively influences local firms, especially the revenue growth of small and medium enterprises (Nguyen *et al*, 2017). The effect is stronger for newly established small firms and new entrants (Nguyen *et al*, 2017). Together, the growth of firms and workers' income will ultimately help improve employment opportunities and welfare for workers.

There are some venues for future research. In future research, we could examine the effect at different skill levels to see how competition affects labour market returns and we can also extend the current study to investigate the effect for each industry.

APPENDIX 1: STATA OUTPUT OF THE DATA STRUCTURE CHECK

```
. xtset if wage_earner==1
```

```
memberID: 1, 3, ..., 91716      n =      31317
      t: 1, 2, ..., 5          T =         5
      Delta(t) = 1 unit
      Span(t) = 5 periods
      (memberID*t uniquely identifies each observation)
```

```
Distribution of T_i:  min      5%      25%      50%      75%      95%      max
                   1         1         1         1         1         2         3
```

Freq.	Percent	Cum.	Pattern
7002	22.36	22.36	1....
5745	18.34	40.701
5061	16.16	56.86	.1...
4055	12.95	69.81	..1..
3948	12.61	82.42	...1.
1646	5.26	87.67	...11
1417	4.52	92.20	.11..
788	2.52	94.72	.111.
771	2.46	97.18	..111
884	2.82	100.00	(other patterns)
31317	100.00		XXXXX

REFERENCES

- Aghion, P., N. Bloom, R. Blundell, R. Griffith and P. Howitt (2005), "Competition and Innovation: An Inverted-U Relationship," *Quarterly Journal of Economics* 120 pp.701-728.
- Becker, G. (1975), *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education* (2nd ed.), New York: NBER.
- Bertrand, M. and F. Kramarz (2002), "Does Entry Regulation Hinder Job Creation? Evidence from the French Retail Industry," *Quarterly Journal of Economics* 117 pp.1369-1413.
- Blanchard, O. and F. Giavazzi (2003), "Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Markets," *Quarterly Journal of Economics* 118, pp.879-907.
- Blanchard, O. and N. Kiyotaki (1987), "Monopolistic Competition and the Effects of Aggregate Demand," *American Economic Review* 77, pp.647-666.
- Boone, J. (2000), *Competition*, CEPR Discussion Papers Series No. 2636.
- Campos, N. and D. Jolliffe (2003), "After, Before and During: Returns to Education in Hungary (1986-1998)," *Economic Systems* 27, pp.377-390.
- Card, D. (1996), *Deregulation and Labour Earnings in the Airline Industry*, NBER Working

- Paper No. 5687, Cambridge, MA: NBER.
- Dickens, W. and L. Katz (1986), *Inter-industry Wage Differences and Industry Characteristics*, NBER Working Paper No. 2014, Cambridge, MA: NBER.
- Dickens, W. and L. Katz (1987), *Inter-industry Wage Differences and Theories of Wage Determination*, NBER Working Paper No. 2271, Cambridge, MA: NBER.
- Dickens, W. and L. Katz (1992), "Does Unmeasured Ability Explain Inter-industry Wage Differentials?" *Review of Economic Studies* 59, pp.515-535.
- Dixit, A. and J. Stiglitz (1977), "Monopolistic Competition and Optimum Product Diversity," *American Economic Review* 67, pp.297-308.
- Doan, T. and J. Gibson (2012), "Return to Education in Vietnam during the Recent Transformation," *International Journal of Education Economics and Development*, 3, pp.314-329
- Doan, T., Q. Le and T. Tran (2017) "Lost in Transition? Declining Returns to Education in Vietnam," *European Journal of Development Research* 30, pp.195-216.
- Fonseca, R., P. Lopez-Garcia and C.A. Pissarides (2001), "Entrepreneurship, Start-up Costs and Employment," *European Economic Review* 45, pp.692-705.
- General Statistical Office (2008, 2010, 2012, 2014, 2016), *Vietnam Household Living Standards Survey: 2008, 2010, 2012, 2014 and 2016* [Datasets], Hanoi, Vietnam: GSO.
- Gibbons, R., L. Katz, T. Lemieux and D. Parent (2005). "Comparative Advantage, Learning, and Sectoral Wage Determination," *Journal of Labor Economics* 23, pp.681-724.
- Griffith, R., R. Harrison and G. McCartney (2007), "Product Market Reforms, Labour Market Institutions and Unemployment," *The Economic Journal* 117, C142-C166.
- Guadalupe, A. (2007), "Product Market Competition, Returns to Skill, and Wage Inequality," *Journal of Labour Economics* 25, pp.439-474.
- Heckman, J., L. Lochner and P. Todd (2003), *Fifty Years of Mincer Earnings Regressions*, NBER Working Papers 9732, Cambridge, MA: NBER.
- International Monetary Fund (2012), *Article IV Consultation*, IMF Country Report No.12/165, Washington, DC: IMF.
- Katz, L. and D. Autor (1999), "Changes in Wage Structure and Earnings Inequality," In O. Ashenfelter and D. Card (Eds.), *Handbook of Labour Economics* 3, pp.1463-1555, Amsterdam: Elsevier.
- Krueger, A. and L. Summers (1988), "Efficiency Wages and the Inter-industry Wage Structure," *Econometrica*, 56, pp.259-293.
- Kugler, A. and G. Pica (2003), *Effects of Employment Protection and Product Market Regulations on the Italian Labour Market*, Institute for the Study of Labor, Discussion Paper 948.
- Martins, P. (2004), "Industry Wage Premia: Evidence from the Wage Distribution," *Economic Letters* 83, pp.157-163.
- McKenzie, D. (2012), "Beyond Baseline and Follow-up: The Case for More T in Experiments," *Journal of Development Economics* 99, pp.210-221.
- Mincer, J. (1974), *Schooling, Experience and Earnings*, New York: NBER.
- Neal, D. (1998), "The Link between Ability and Specialization: An Explanation for Observed Correlations between Wages and Mobility Rates," *Journal of Human Resources* 33, pp.173-200.
- Nguyen, B., T. Mickiewicz and J. Du (2017), "Local Governance and Business Performance in

- Vietnam: The Transaction Costs' Perspective," *Regional Studies* 52, pp.542-557.
- Nickell, S. (1999), "Product Markets and Labour Markets," *Labour Economics* 6, pp.1-20.
- Psacharopoulos, G. and H. Patrinos (2004), "Returns to Investment in Education: A Further Update," *Education Economics* 12, pp.112-134.
- Schweisshelm, E. (2014), *Trade Unions in Transition – Changing Industrial Relations in Vietnam*, Briefing Paper, Friedrich-Ebert-Stiftung, Vietnam Office. Retrieved from: https://www.fes.de/gewerkschaften/common/pdf/2014_09Vietnamese_TU_in_Transition.pdf
- Stiglitz, J. (1984), *Theories of Wage Rigidity*, NBER Working Paper No. 1442, Cambridge, MA: NBER.
- Tran, T. Q., H.V. Vu, T.T. Doan and H.D. Tran (2016), "Corruption, Provincial Institutions and Firm Performance: Evidence from Vietnam," *Estudios de Economia* 43, pp.1-23.
- Tran, T. Q., A.L. Tran, T.M. Pham and H.V. Vu (2018), "Local Governance and Occupational Choice among Young People: First Evidence from Vietnam," *Children and Youth Services Review* 86, pp.21-31.
- Vietnam Chamber of Commerce and Industry (2007-2016), *Provincial Competitiveness Index: 2007-2016* [Datasets], Hanoi, Vietnam: VCCI.
- Yang, D. (2004), *Determinants of Schooling Returns during Transition: Evidence from Chinese Cities*, Blacksburg, VA: Virginia Polytechnic Institute and State University.