

Sub-national union coverage and the youth's labor market outcomes: evidence from a national survey in Vietnam

Thang Ngoc Bach

*Institute for Sustainable Development, National Economics University,
Hanoi, Viet Nam*

Hung Ly Dai

VNU International School, Vietnam National University, Hanoi, Viet Nam

Viet Hung Nguyen

Faculty of Economics, National Economics University, Hanoi, Viet Nam, and

Thanh Le

Faculty of Business and Law, University of Wollongong, Wollongong, Australia

Abstract

Purpose – This paper examines the effects of sub-national union coverage on the youth's labor market outcomes.

Design/methodology/approach – In the context of the private business sector in Vietnam, this study link individual labor market data with union coverage at provincial level in the period 2013–2016 to investigate the effects of sub-national union coverage on the youth's labor market outcomes. Contingent on the outcome variable, we use the OLS and probit model that control for diverse individual characteristics, year- and industry-fixed effects, and particularly control for selection bias in the labor market.

Findings – The empirical results show that the union coverage is positively associated with a wide range of the youth's labor market outcomes, including employment status, wage rate, work hour, and job formality. Also, the coverage is complementary to individual labor contract in determining the youth's wage rate.

Practical implication – Our empirical results indicate positive associations between union coverage and the youth's multi-dimensional labor market outcomes, which contribute to this young age cohort's smooth school-to-work transition, provided that the role of trade union is challenged both in developing and developed countries.

Originality/value – This study provides an in-depth study on the interplay between trade union and the youth's labor market outcomes that contributes to the literature of labor market institutions and youth employment policies in a dynamic transitional economy of Vietnam.

Keywords Collective bargaining, Trade unions, Youth employment, Labor market outcomes, Selection bias
Paper type Research paper

1. Introduction

There are a large number of studies on the effect of trade union, or collective bargaining, on wages and employment (for example; to name a few, Kahn, 2000; Card, 2001; Bryson and

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Blanchflower, 2003; Yao and Zhong, 2013 and Torm, 2018), but little research has been undertaken on the effect of trade union on the youth's multi-dimensional labor market outcomes. Most of the previous studies refer to employees of all age cohorts, thus ignoring its effects on the youth, which is distinguished with high unemployment and high job turnovers (Ryan, 2001). According to the school-to-work transition survey, young laborers from 15 to 29 years old in Vietnam take on average 2.5–5 years for a successful transition – finding a stable, secured and satisfactory job (Nguyen *et al.*, 2015). In this transition process labor market institutions plays an important role in determining youth employment (Ryan, 2001). For example, Christopoulou (2013) finds that youth labor outcomes had deteriorated across OECD countries since the mid-1970s, which was partly due to each country's mix of labor market institutions.

In a study of youth employment in four fast-growing Asian economies (Bangladesh, Cambodia, Nepal, and Vietnam), McKay *et al.* (2018) exert that many young people continue to be engaged in self-employment or unpaid family work, and the availability of formal jobs for the youth differs across the four countries. With a data set consisting of 17 OECD countries in the period 1960–1996, Bertola *et al.* (2007) find that time-varying unionization rates lower the employment-population ratio of young and older individuals relative to prime-aged, and unionization increases the unemployment rate of young men compared to prime-aged people. There have been few studies on the interplay between trade unions and youth labor market outcomes in developing countries. In Vietnam there is a need for labor market institutions that give voice to workers and employers but do not hinder creative destruction and creation of formal sector jobs (Schmillen and Packard, 2016). It is thus challenging to balance the presence of trade union and the youth's labor market outcomes. An in-depth study on the interplay between trade union and the youth's labor market outcomes contributes not only to the related literature of collective bargaining but also to youth employment policies in a dynamic transitional economy like Vietnam.

In this study we examine the relationship between trade union coverage and the youth's labor market outcomes in Vietnam during the period 2013–2016. Specifically, there are two major research questions. *First*, what are the effects of trade union coverage on the youth's multi-dimensional labor market outcomes, including employment status, wage rate, work hour and job formality? *Second*, does trade union coverage complement or substitute individual labor contract in determining wage rate and work hour? We seek to address these two questions by matching a large nationwide labor force survey of individuals with union coverage in the private sector in a dynamic transitional economy of Vietnam. Although the private sector is experiencing a high and dynamic growth process, its union coverage is much lower than that of the state and foreign sector (Torm, 2018). In addition, to examine large time changes and differences in union coverage at sub-national level, we employ a measure of union coverage at provincial level (the percentage of privately-owned firms having trade unions), instead of union density (union members as a percentage of all employees), as the former better captures various degrees of unionization across provinces and Vietnamese laws do not discriminate between union and non-union members in the workplaces.

Our study has the following three important findings. *First*, trade union coverage at provincial level is positively associated with employment status, wage rate and work hour. One-percent higher union coverage at the provincial level raises the probability of being employed by 0.15 percent, and increases wage rate and work hour by about 0.35 percent and 0.04 percent, respectively. *Second*, union coverage helps increase the youth's job formality in terms of having labor contract and social insurance. In particular, one-percent increase in union coverage raises the youth's probability of having contract and social insurance by 0.19 and 0.32 percent, respectively. *Third*, union coverage is complementary to individual labor contract in determining the youth's wage rate, not work hours. The positive association between union coverage and the youth' multi-dimensional labor market outcomes reiterates the collective bargaining role of trade unions at the sub-national level in protecting rights and

interests of this vulnerable age cohort in Vietnam. These three empirical results are robust to selection bias. In this aspect, individuals' labor market outcomes are affected by not only their capability and characteristics, but also their motivation to work. In this study, we employ Heckman two-part procedure to address this problem.

This study contributes to the related literature of collective bargaining and the youth's labor market outcomes in the following three aspects. *First*, to the best of our knowledge, this study is the first to address the interplay between union coverage and the youth's labor market outcomes in a developing economy like Vietnam. Trade union's representativeness in Vietnam differs greatly to developed countries. In this communist developing country, unions are entitled to act not only on behalf of their members, but likewise as conveyor belts of public authorities (Grosse, 2015). *Second*, studies of the relationship between trade union at sub-national level and the youth's individual labor market outcomes are scarce. Recent studies examine youth unemployment and labor market performance at regional level, but do not relate to collective bargaining (Demidova and Signorelli, 2012; Demidova *et al.*, 2013), or do not refer to individuals' labor market outcomes as our paper (Budd *et al.*, 2014). Linking union coverage at sub-national level with individual-level data is believed to provide more concrete micro-based evidence on the interplay between unions' externalities and individuals' labor market outcomes. *Third*, improvements in labor market conditions enhance the probability of having individual labor contract among the youth in developing countries, but whether this labor contractual institutions complement or substitute trade union is an open question.

The remaining of the paper is organized as follows. Section 2 is the literature review on the relationship between trade union and the youth's labor market performance. Section 3 discusses the development and some unique features of trade union in Vietnam. The following section is on data description and empirical strategy. Section 5 deals with empirical results and discussions. Section 6 concludes.

2. Literature review

There is a rich literature on the key drivers of the youth performance on the labor market. Most of these studies focus on youth employment in developed countries. In developing countries, recent studies examine all age cohorts, not the youth. For example, Yao and Zhong (2013) investigate the unions' effects on worker welfare in China, based on a sample set of 1,268 firms in 12 cities. They show that unionization exerts significantly positive impact on hourly wages and on pension coverage, but weakly negative effect on monthly working hours. Their studies are closely related to the findings by Ge (2007) and Lu *et al.* (2010) also on the case of China. Tom (2018), on one matched employer-employee data set from 2013 to 2015 surveys, analyzes the union wage premium among Vietnamese small and medium-sized enterprises. On accounting for firm and worker characteristics, the paper establishes that unionized workers' wages are 9–22 per cent higher than those of non-union workers. In particular, the wage gain at upper end is greater than that at lower end of wage distribution. By case-study method on ten Vietnamese firms, Clarke *et al.* (2007) suggest that workers in firm with trade unions have ability to negotiate wages which can be about 5 per cent higher than those in firms without unions.

Another line of research concerns the role of union at the aggregate level. On the aggregate level, Bertola *et al.* (2007) studies the correlation between youth employment and unionization by one theoretical model of collective wage setting. In particular, the unionization can reduce employment more for groups with relatively elastic labor supply such as young people, together with older individuals and women. Rigby and Calavia (2018) examine the role of institutional resources as source of power available to trade unions in three Southern European countries, including Greece, Portugal and Spain. They argue that the institutional security is an essential platform for unions seeking to develop other sources of power.

Since these aforementioned papers emerge from using the aggregate data such as at country level, the results are sensitive to endogeneity as inherent in the trade union-labor

outcome nexus, that is workers tend to work for firms with trade union, due to higher perceived wages. And the problem can be addressed by employing disaggregated data, such as on provincial-level data sample. Following this line of research, [Budd *et al.* \(2014\)](#), on one provincial-level data from the period of 1994–2008, find that union density is not correlated with average wage levels, but is positively associated with aggregate productivity and output. On one empirical study for Russia, [Gimpelson *et al.* \(2010\)](#) explores the impact of variations across regions and across time periods in enforcement of employment protection laws on labor market outcomes. They reveal the evidence that these variations can translate into better labor performances. [Baranowska and Michael \(2010\)](#) solves the problem of endogeneity on regression by using comparative micro data from the 2004 European Union Labor Force Survey for twenty-three European countries to research on the role of labor market institutions on the youth employment. They show that the collective bargaining coverage, which is a proxy of insider-outsider cleavages, is positively correlated with the relative temporary employment risk of young persons.

Our paper's research questions are basically on the effect of unionization on the youth's labor market outcomes. In measuring various degree of unionization, there are two popular measures of union density and union coverage. Union density is defined as union members as a percentage of all employees, while union coverage corresponds to the percentage of employees covered by collective agreements ([Cahuc *et al.*, 2014](#)). Union coverage is generally larger than union density as the former considers all the employees covered by collective labor agreements, which could be put in place at either firm- or industry-level. As an empirical study in Vietnam, we use union coverage as Vietnamese laws do not discriminate between union and non-union members in the workplaces. [Fitzenberger *et al.* \(2013\)](#) also discusses differed impacts of union density and coverage on wages and wage distribution in Germany.

In short, [Budd *et al.* \(2014\)](#) is closely related to our paper but it uses union density instead of union coverage as our paper. It also does not explicitly address the interplay between union coverage and the youth's various labor market outcomes like ours. Furthermore, the association between two different types of labor market institutions like trade union and labor contract is scant in the literature. A deeper study on the effect of union coverage at the sub-national level on the youth's various labor market outcomes is believed to contribute to the related literature of labor market institutions and youth employment policies in a dynamic transitional economy of Vietnam.

3. The development of trade unions in Vietnam

In 1994, Vietnam adopted one new Labor Code, which was then amended in 2002. The Code establishes one framework to regulate the employment relations, on accounting for the individual labor contracts and collective agreements. In early 2013, the Amended Labor Code (ALC) and the new Union Law (NUL) both became effective. The ALC expresses that the trade unions serve to represent and protect the lawful and legitimate rights and interests of trade union members and workers; take part in negotiating, signing, and monitoring the implementation of regulations related to workers such as work norms, and wage payment. The representatives of trade union, besides protecting the rights and interests of their members, also participate in compliance procedures in the NUL, including the implementation of regimes and policies for the employees. Moreover, the NUL not only specifies the functions, tasks, and participation of trade unions in inspecting, supervising, and monitoring the activities of agencies, organizations, and enterprises, but also represent the rights of employees to participate on the trade union activities.

Compared to the Trade Union Law implemented in 1994, the NUL makes some new progress. It sets up the rule that all companies, both foreign-invested and local, must pay a mandatory union fee of 2 per cent of the total payroll as a social insurance contribution, even

in the firms without trade unions. The rule results on more centralization of the ownership of all trade union assets under the VGCL. Moreover, the NUL states that the immediate upper-level trade union has the right and obligation to represent and protect the legitimate and lawful rights and interests of workers on case of lacking grassroot trade union.

There are also difference between the trade union characteristics in Vietnam and that in the western economies. *Clarke et al. (2007)* show that, in Vietnam, the authorities are still confined within the legalistic framework of the state-socialist era. Moreover, the trade unions do not have tendency to stand up to employers on behalf of their members. And domestic workers prefer the direct action over the representative industrial relations structures. One common assessment by some researchers is that the unions in Vietnam, as in other communist countries, are supposed to be both on behalf of members and of public authorities. However, *Grosse (2015)*, by using data from the World Value Survey, show that trade union members in the communist countries are in general not less representative for the wider labor force than in the liberal-democratic countries. The reason can rely on the crucial role of the interaction between workers and authorities on shaping the performance of trade union. Indeed, *Clarke and Pringle (2009)* compare the performance of trade union between communist countries including Vietnam and China, with that of Russia, where the unions are independent. Their results prove that the form and extent of independent worker activism, and the response of the state to such activism are much more important than the legal and institutional aspects of industrial relations on determining the trade union development. Therefore, the arrangement between workers and authorities is important for the results of trade union activities.

4. Data and empirical strategy

4.1 The data

The primary data for empirical analysis is drawn from the labor force survey (LFS), which is conducted annually by Vietnam General Statistic Office (VGSO). This is individual-level data. Besides, union coverage at provincial level is computed from the Provincial Competitiveness Index (PCI) survey, which is conducted annually by Vietnam Chamber of Commerce and Industry (VCCI). The PCI is a credible data source for measuring union coverage of the private business sector at the provincial level, as the survey uses stratified random sampling to mirror provincial populations in all 63 provinces in Vietnam [1]. Also, the LFS is implemented nationwide with stratified random sampling, targeting all the 63 provinces/cities in Vietnam. The LFS data is cross sectional at the individual level, not panel data. Besides demographic characteristics, the survey collects detailed information and characteristics of three major groups of respondents: (1) the employed, (2) the unemployed, and (3) the people not in economic activities, such as students, housewives, and the retirees. For the purpose of analysis, we match the LFS with PCI data based on the provincial identifiers of 63 provinces in Vietnam.

As this study targets youth employment, the data on people aged from 15 to 29 in the four years from 2013 to 2016 in the LFS survey are retained for empirical analysis. This age cohort yields ample time to capture diverse labor market outcomes of the youth, and is consistent with the age cohort in the International Labor Organization's school-to-work transition survey. After trimming the top and bottom 1 percent of wage and work hour distribution, there are 67,266 employed people and 81,619 in the labor force aged from 15 to 29.

Table 1 below details definition of all the variables used in the empirical analysis. Besides the trade union coverage which is measured at the provincial level, all the other variables are at the individual level. It is worth noting that the trade union coverage is at the provincial level, which is the aggregate data of privately-owned firms reporting union presence at their

Variable	Definition
Union coverage	The percentage of privately-owned firms that establish trade union at the provincial level
Employment status	A person's work status, which is equal to 1 for those being employed, and 0 otherwise
Wage rate	A person's hourly wage rate, in thousand Vietnam dong
Log(Wage rate)	Natural logarithm of a person's hourly wage rate, which is originally in thousand Vietnam <i>dong</i> . Taking natural logs eases the interpretation in percentage change, regardless of unit of measurement
Work hour	A person's work hours per week
Log(Work hour)	Natural logarithm of a person's work hours per week. Taking natural logs eases the interpretation in percentage change, regardless of unit of measurement
Having contract	A dummy variable, which is equal to 1 for those having a formal job with labor/employment contract, and 0 otherwise
Having insurance	A dummy variable, which is equal to 1 for those having a formal job with social insurance contribution, and 0 otherwise
Household head	A person's household status, which is equal to 1 for those being household's head, and 0 otherwise
Gender	A person's gender, which is equal to 1 for males, and 0 for females
Age	A person's age in years
Age squared	The squared value of age
Marital status	A person's marital status, which is equal to 1 for being married, and 0 otherwise
Educational level	A categorical variable indicating a person's educational level, ranging from secondary, higher secondary, secondary vocational, college to university education
Work experience	A categorical variable denoting a person's years of work experience, including less than 1 year, 1–5 years, 5–10 years, and more than 10 years
Job sector	A dummy variable indicating a person's job sector, which is equal to 0 for proprietorship and 1 privately-owned companies

Table 1.
 Definition of variables

workplace. This coverage matches with the labor market outcomes of the youth working in the private sector, not the public or foreign-owned ones.

Table 2 presents individual characteristics and multi-dimensional labor market outcomes of the youth in the 4-year period from 2013 to 2016. Among them, the employment status, or the employment rate was stable at 78% in the first two years, 2013–2014, then increased to 84% and 87% in the following two years, 2015–2016. The average wage rate increased 30%, from VND16,980 in 2013 to VND20,840 in 2016. In the meantime, the average work hours per week decreased slightly from 49.06 h to 48.75 h. With respect to job formality, the percentage of the youth having labor contract was low at 58% in 2013, 60% in 2014, 56% in both 2015 and 2016. The percentage of the youth having insurance was even lower, not more than 40% throughout the study period. Male respondents accounted for 49% of the sample in 2013–2014 and 50% in 2015–2016. The proportion of the youth getting married increased from 15% in 2013 to 19% in 2016.

The trade union coverage was low but differs greatly across provinces throughout the study period. The percentage of private domestic businesses having trade unions was 17.7% in 2013, 20.8% in 2014, 21.4% in 2015, and 22.4% in 2016. There are big gaps in trade union coverage across provinces, and these gaps seem not narrow over time. For example, in 2013 the lowest-covered province had 4.8% of private domestic firms having trade unions, while the highest was 39.5% in the highest-covered one. In 2016, the percentages were 10.3% in the lowest-covered province, and 47.7% in the highest-covered province. It is noteworthy that the trade union coverage was persistently higher in the northern region, while the south was catching up with the central. In 2016 there were 25.2% of private domestic firms having trade unions in the north, while the rates were 20.5% in the south and 20.7% in the central. Table 3 below details trade union coverage across three major regions in the period 2013–2016.

Variable	2013		2014		2015		2016	
	Mean	Std. Dev						
Employment status (Having employed = 1)	0.78	0.41	0.78	0.42	0.84	0.37	0.87	0.34
Log(Wage rate)	2.77	0.35	2.87	0.35	2.90	0.36	2.98	0.34
Wage rate	16.98	6.22	18.66	6.77	19.33	7.08	20.84	7.21
Log(Work hour)	3.88	0.17	3.87	0.18	3.87	0.18	3.87	0.16
Work hour	49.06	7.52	48.66	7.85	48.64	7.76	48.75	7.16
Having contract	0.58	0.49	0.60	0.49	0.56	0.50	0.56	0.50
Having insurance	0.35	0.48	0.37	0.48	0.37	0.48	0.40	0.49
Household head	0.03	0.18	0.03	0.17	0.05	0.23	0.05	0.22
Gender (Male = 1)	0.49	0.50	0.49	0.50	0.50	0.50	0.50	0.50
Age	19.75	4.00	19.82	4.02	20.28	4.17	20.29	4.28
Marital status (married = 1)	0.15	0.36	0.16	0.36	0.19	0.39	0.19	0.39
Job sector	0.63	0.48	0.66	0.47	0.60	0.49	0.60	0.49
<i>Work experience^a</i>								
<1 year	0.21		0.21		0.22		0.19	
1-5 years	0.67		0.69		0.66		0.67	
5-10 years	0.11		0.10		0.11		0.12	
>10 years	0.01		0.01		0.01		0.01	
<i>Educational level^f</i>								
Secondary	0.32		0.31		0.38		0.37	
Higher secondary	0.22		0.23		0.31		0.33	
Secondary vocational	0.24		0.20		0.07		0.06	
College education	0.10		0.11		0.10		0.10	
University education	0.12		0.15		0.14		0.14	

Table 2. Summary statistics, 2013–16

Note(s): Wage rate is in thousand Vietnam dong per work hour. Work hour is the number of work hours per week. ^aThe fraction of each category in each year

Source(s): Authors' calculation from the annual labor force survey

4.2 The empirical strategy

4.2.1 *The baseline models.* There are two baseline model used in the empirical analysis. For the first research question, we use the following model.

$$\text{Labor market outcome}_{it} = \alpha \cdot \text{Union coverage}_{pt} + X_{it}\beta + \theta_t + \vartheta_{ins} + \mu_{it} \quad (1)$$

Labor market outcome_{ipt} are the diverse labor market outcomes of individual *i* in year *t*, including employment status, wage rate, work hours, having labor contract and insurance. Union coverage_{pt} the percentage of privately-owned firms that establish trade union at the provincial level. *X_{it}* is the vector of other control covariates of individual *i* in year *t*, including gender, age, educational levels, and job characteristics such as work experience and job sector. *μ_{it}* is the usual random error. *θ_t* and *ϑ_{ins}* are respectively year- and industry-specific effects [2]. The inclusion of these effects is important to control for macroeconomic shocks over time, and large differences in labor market outcomes for people working in different industries. For example, people working in the service sector could have different labor market outcomes compared to those working in the manufacturing sector, due to market demand and skill requirements. The model (1) above uses the OLS estimator for the continuous dependent variables of wage rate and work hours, and the probit estimator for the dummy dependent variables of employment status, having labor contract or insurance.

For the second research question, individual labor contract is interacted with union coverage to seek whether this interactive term might affect the labor market outcomes, which

Year	Mean	Std. Dev	Min	Max
Year 2013	0.177	0.065	0.048	0.395
North	0.204	0.069	0.082	0.395
Central	0.184	0.046	0.070	0.258
South	0.132	0.055	0.048	0.295
Year 2014	0.208	0.067	0.058	0.370
North	0.238	0.053	0.153	0.370
Central	0.185	0.060	0.058	0.310
South	0.192	0.076	0.080	0.329
Year 2015	0.214	0.070	0.077	0.372
North	0.244	0.063	0.128	0.360
Central	0.197	0.068	0.077	0.372
South	0.190	0.069	0.101	0.346
Year 2016	0.224	0.068	0.103	0.477
North	0.252	0.067	0.165	0.477
Central	0.207	0.065	0.108	0.308
South	0.205	0.065	0.103	0.337
Total	0.206	0.069	0.048	0.477

Table 3. Trade union coverage in 2013–16, by region

Source(s): Authors' calculation from the annual provincial competitiveness index survey

could be either wage rate or work hour. The interactive term is used to examine whether labor contract complements union coverage in determining wage and work hour. All the related variables are defined above.

$$\begin{aligned} \text{Labor market outcome}_{it} = & \alpha \cdot \text{Union coverage}_{pt} + \beta \cdot \text{Labour contract}_{it} \\ & + \gamma \cdot \text{Union coverage}_{pt} * \text{Labour contract}_{it} + X_{it} \delta + \theta_t \quad (2) \\ & + \vartheta_{ins} + \mu_{it} \end{aligned}$$

4.2.2 Controlling for selection bias. One issue of the two baseline models above is selection bias associated with the dependent variables. The various labor market outcomes of a certain young person are determined not only by his or her capability and characteristics, but also by his or her unobserved heterogeneity like motivation to work. This unobserved heterogeneity might lead to biased responses to labor force and other labor market outcomes. For example, a married person might have a higher propensity to work to earn for their family's living than a single person. For these reasons, it is essential to control for selection bias associated with the two baseline models above. Our rich sample allows to control for the selection bias, as it comprises not only the employed but also the unemployed. In this study, we employ the Heckman two-part procedure to address the possible selection biases. There are two equations estimated simultaneously with the Heckman two-part procedure. The first is the outcome equation which is basically the same as Eqns (1) and (2) above. The second is the selection equation into employment status, where we use gender, age, age squared, educational level, household head and marital status as explanatory variables. Among these, household head and marital status are not present in the outcome equation. These two variables are highly correlated with employment status decision and have little direct effect on the other labor market outcomes like wage, work hours, having labor contract or insurance. The two instrumental variables thus satisfy the relevance and exclusion restriction.

5. Results and discussions

In this section, we first examine the effects of provincial trade union coverage on the youth's various labor market outcomes. We then run additional specifications to control for selection bias.

5.1 The baseline results

The empirical results in Table 4 are estimated with the baseline model (1) above. There are five specifications in this table, which differ in the inclusion of additional control covariates, year- and industry-specific effects. It is worth noting that the number of observations in specification (4.1) is the youth in the labor force, including both the employed and unemployed. The remaining specifications deal with the employed youth only. Table 4 shows that there is a positive association between union coverage and the youth's various labor market outcomes, including employment status, wage rate, work hours, having labor contract and insurance. This is evidenced by a positive and highly significant estimate for union coverage in all the specifications from (4.1) to (4.4). Specifically, a one-percent rise in union coverage at the provincial level is associated with a 0.15-percent increase in the likelihood of being employed by the youth [3] (the averaged marginal effect in specification (4.1), not reported in here). A one-percent rise in union coverage at the provincial level is associated with a 0.19% and 0.32% -percent increase in the likelihood of having labor contract and insurance (the averaged marginal effect in specifications (4.4) and (4.5), not reported in here). In the specifications (4.2) and (4.3), the similar effect on wage rate and work hours are estimated at 0.35% and 0.04%, respectively.

Regarding the other control covariates in Table 4, the male youth is positively associated with wage rate and work hours, but negatively associated with having contract or insurance. There is an inverted U-shape relationship between age and wage, work hours, having contract and insurance. Education and work experience play a positive role in enhancing the youth's labor market outcomes, especially on their wage level and job formality (having contract and insurance). However, education is negatively related with the status of being employed. This could be explained on the ground that at their young ages they have a high propensity to delay their employment to look for a better job opportunity. Finally, the youth working in the privately-owned businesses have a better labor market outcomes than those working in the sole proprietorship.

Table 5 addresses the second research question by providing empirical results for the baseline Eqn (2) above. It shows that union coverage at the provincial level and labor contract complement to, or reinforce, each other in providing higher wages for the youth. This is evidenced by a positive and significant estimated coefficient for *Union coverage*Labor contract* in the specifications (5.1) and (5.2). However, the interactive term of these two types of labor market institutions is statistically insignificant in determining work hours in the specifications (5.3) and (5.4). They separately have discernible effects on the youth's wage rate and work hours, which is evidenced by the positive and significant estimates for *Union coverage* and *Labor contract* in all the specifications from (5.1) to (5.4). For example, having a labor contract is associated with a 6-percent and 2-percent increase in wages and work hours (specifications (5.2) and (5.4)). All the other control covariates have similar effects as those reported in Table 4 above.

5.2 Addressing selection bias

Table 6 replicates Table 4 above but controls for potential selection bias in the labor market. There are four pairs of specifications in this table, each corresponds to one labor market outcome facing the youth, including wage rate, work hours, having labor contract and insurance. In each pair of specifications, both outcome and selection equation are estimated simultaneously with the Heckman two-part procedure. The empirical results with the outcome equations are basically the same as Table 4 above, where union coverage at the provincial level is positively associated with various labor market outcomes of the youth, including wage rate, work hours, having labor contract and insurance. This is evidenced by the positive and significant estimates for *Union coverage* in the specifications (6.1), (6.3), (6.5)

Dependent variable	(4.1) Employment status	(4.2) Log(Wage rate)	(4.3) Log(Work hour)	(4.4) Having contract	(4.5) Having insurance
Union coverage	0.669*** (0.083)	0.355*** (0.018)	0.042*** (0.010)	1.094*** (0.102)	1.461*** (0.094)
Gender	0.009 (0.011)	0.114*** (0.003)	0.017*** (0.002)	-0.097*** (0.016)	-0.125*** (0.014)
Age	-0.107*** (0.021)	0.047*** (0.005)	0.005*** (0.003)	0.112*** (0.027)	0.129*** (0.027)
Age squared	0.005*** (0.0005)	-0.001*** (0.0001)	-0.0001* (0.0001)	-0.002*** (0.0006)	-0.002*** (0.0006)
<i>Education level: Reference to secondary</i>					
Higher secondary	-0.234*** (0.016)	0.012*** (0.003)	-0.002 (0.002)	0.321*** (0.017)	0.174*** (0.017)
Secondary vocational	-0.572*** (0.019)	0.051*** (0.004)	-0.010*** (0.002)	0.500*** (0.024)	0.359*** (0.022)
College	-0.897*** (0.019)	0.064*** (0.005)	-0.012*** (0.003)	0.736*** (0.028)	0.531*** (0.024)
University education	-1.148*** (0.018)	0.197*** (0.005)	-0.032*** (0.002)	0.929*** (0.028)	0.825*** (0.023)
<i>Work experience: Reference to less than 1 year</i>					
1-5 years		0.142*** (0.003)	0.011*** (0.002)	0.399*** (0.018)	0.817*** (0.018)
5-10 years		0.220*** (0.005)	0.017*** (0.003)	0.429*** (0.027)	1.142*** (0.026)
More than 10 years		0.227*** (0.012)	0.035*** (0.007)	0.176*** (0.066)	0.948*** (0.064)
<i>Job sector: Reference to sole proprietorship</i>					
Privately-owned	Yes	0.104*** (0.003)	0.0127*** (0.002)	2.188*** (0.016)	2.194*** (0.024)
Year-specific effect	No	Yes	Yes	Yes	Yes
Industry-specific effect	81,619	Yes	Yes	Yes	Yes
Number of observations	0.118	67,255	67,255	67,233	67,255
R ²		0.270	0.021	0.545	0.424

Note(s): Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source(s): Authors' estimation from Eqn (1) in the empirical strategy section

Table 4.
Union coverage and labor market outcomes

Dependent variable	(5.1) Log(Wage rate)	(5.2) Log(Wage rate)	(5.3) Log(Work hour)	(5.4) Log(Work hour)
Union coverage	0.449*** (0.029)	0.280*** (0.029)	0.051*** (0.018)	0.059*** (0.018)
Labor contract	0.052*** (0.009)	0.062*** (0.009)	0.025*** (0.005)	0.022*** (0.005)
Union coverage*Labor contract	0.070* (0.037)	0.099*** (0.036)	-0.016 (0.021)	-0.034 (0.021)
Gender	0.163*** (0.003)	0.115*** (0.003)	0.00755*** (0.001)	0.0168*** (0.002)
Age	0.055*** (0.005)	0.045*** (0.005)	0.006** (0.003)	0.005* (0.003)
Age squared	-0.0008*** (0.0001)	-0.0006*** (0.0001)	-0.0001** (0.0001)	-0.0001* (0.0001)
<i>Education level: Reference to secondary</i>				
Higher	0.0101*** (0.003)	0.007** (0.003)	-0.002 (0.002)	-0.003* (0.002)
Secondary	0.017*** (0.004)	0.043*** (0.004)	-0.011*** (0.002)	-0.012*** (0.002)
vocational				
College	0.070*** (0.005)	0.053*** (0.005)	-0.020*** (0.003)	-0.014*** (0.003)
University education	0.214*** (0.005)	0.183*** (0.005)	-0.045*** (0.002)	-0.034*** (0.002)
<i>Work experience: Reference to less than 1 year</i>				
1-5 years	0.141*** (0.003)	0.135*** (0.003)	0.009*** (0.002)	0.010*** (0.002)
5-10 years	0.225*** (0.005)	0.214*** (0.005)	0.014*** (0.003)	0.016*** (0.003)
More than 10 years	0.239*** (0.013)	0.223*** (0.012)	0.032*** (0.007)	0.035*** (0.007)
<i>Job sector: Reference to sole proprietorship</i>				
Privately-owned	0.039*** (0.004)	0.047*** (0.004)	0.002 (0.002)	0.003 (0.002)
Year-specific effect	No	Yes	No	Yes
Industry-specific effect	No	Yes	No	Yes
Number of observations	67,255	67,255	67,255	67,255
R ²	0.213	0.275	0.009	0.022

Table 5. Complementary effect of union coverage and labor contract

Note(s): Robust standards errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source(s): Authors' estimation from Eqn (2) in the empirical strategy section

and (6.7). The validity of the two instrumental variables *Household head* and *Marital status* are verified in the selection equation, where the estimated coefficients for these two variables are positive and statistically significant in all the specifications (6.2), (6.4), (6.6) and (6.8). The youth's self-selection into employment status is thus determined by their household position and marital status. These two variables represent their family commitments that drive their motivation to work. Other control variables in the selection equation also show discernible effects. For example, the male youth have a higher propensity to work, which is evidenced by the positive and significant estimate for the variable *Gender*. Age has a U-shaped effect on the motivation to work, which is characterized with the youth's commitment to education in their early careers. Table 6 also presents a formal test of independence between outcome and selection equations. The Wald test statistics indicate rejection of independent equations in the specification with wage rate, work hours and having insurance. This supports the use of Heckman two-part procedure.

Similar to Table 6, Table 7 shows estimates results for the Heckman two-part procedure in examining the complementary effect between two labor market institutions of union

Dependent variable	(6.1) $\text{Log}(\text{Wage rate})$		(6.2)		(6.3) $\text{Log}(\text{Work hour})$		(6.4)		(6.5) Having contract		(6.6)		(6.7) Having insurance		(6.8) Selection	
	Outcome	Selection	Outcome	Selection	Outcome	Selection	Outcome	Selection	Outcome	Selection	Outcome	Selection	Outcome	Selection	Outcome	Selection
Union coverage	0.352*** (0.018)		0.043*** (0.010)		1.093*** (0.102)		1.432*** (0.093)		0.042*** (0.011)		1.432*** (0.093)		1.432*** (0.093)		0.043*** (0.011)	
Gender	0.113*** (0.003)	0.035*** (0.011)	0.017*** (0.002)	0.043*** (0.011)	-0.097*** (0.016)	0.087*** (0.021)	-0.125*** (0.014)	0.043*** (0.011)	-0.079*** (0.021)	0.112*** (0.027)	-0.125*** (0.014)	-0.079*** (0.021)	-0.125*** (0.014)	-0.079*** (0.021)	0.043*** (0.011)	0.043*** (0.011)
Age	0.048*** (0.005)	-0.085*** (0.021)	0.005* (0.003)	-0.087*** (0.021)	0.112*** (0.027)	0.004*** (0.0005)	0.129*** (0.026)	-0.079*** (0.021)	0.004*** (0.0005)	0.002*** (0.0006)	0.129*** (0.026)	0.004*** (0.0005)	0.002*** (0.0006)	0.004*** (0.0005)	0.004*** (0.0005)	0.004*** (0.0005)
Age squared	-0.0008*** (0.0001)	0.004*** (0.0005)	-9.58e-05* (0.0001)	0.004*** (0.0005)	-0.002*** (0.0006)	0.363*** (0.029)	-0.002*** (0.0006)	0.004*** (0.0005)	0.360*** (0.029)	0.360*** (0.029)	-0.002*** (0.0006)	0.360*** (0.029)	0.360*** (0.029)	0.360*** (0.029)	0.371*** (0.029)	0.371*** (0.029)
Household head		0.414*** (0.029)		0.414*** (0.029)		0.249*** (0.014)		0.249*** (0.014)		0.248*** (0.014)		0.248*** (0.014)		0.248*** (0.014)		0.248*** (0.014)
Marital status		0.258*** (0.014)		0.258*** (0.014)		0.249*** (0.014)		0.249*** (0.014)		0.248*** (0.014)		0.248*** (0.014)		0.248*** (0.014)		0.248*** (0.014)
<i>Additional control</i>																
Educational level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Work experience	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Job sector	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Year-specific effect	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Industry-specific effect	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Number of observations	81,619	81,619	81,619	81,619	81,619	81,619	81,619	81,619	81,619	81,619	81,619	81,619	81,619	81,619	81,619	81,619
Log pseudolikelihood	-49,189		-10,676		-54,394		-54,394		-54,394		-54,394		-54,394		-54,394	
Wald test of independent equations	243.5		59.6		1.4		1.4		1.4		1.4		1.4		1.4	

Note(s): Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source(s): Authors' estimation based on the Heckman two-part procedure

Table 6. Union coverage and labor market outcomes (Addressing selection bias)

coverage and labor contract. There are two pairs of specifications in this table, each corresponds to one labor market outcome of wage rate or work hours. The estimated results reconfirm the complementary effect of union coverage and labor contract on wage rate, not work hours. This is also present with the baseline result in Table 5 above. Union coverage and labor contract are thus complementary to each other in determining wage rate even in the presence of selection bias. The estimated coefficients for *Union coverage* and *Labor contract* are positive and highly significant in the specifications (7.1) and (7.3). The two instrumental variables *Household head* and *Marital status* are valid in the selection equation, where their estimated coefficients are positive and highly significant. All the other control covariates have discernible effects and are basically the same as those reported in Table 6 above.

6. Conclusion

This study examines the effects of trade union coverage on the youth's various labor market outcomes, including employment status, wage rate, work hours, and job formality. It also investigates the complementary effects of union coverage and individual labor contract on wage rate and work hour of the youth. Our study has three important findings. *First*, trade union coverage at the provincial level is positively associated with employment status, wage rate and work hour. One-percent higher union coverage raises the probability of being employed by 0.15 percent, and increases wage rate and work hour by about 0.35 percent and 0.04 percent, respectively. *Second*, union coverage helps increase the youth's job formality in

Dependent variable	(7.1)	(7.2)	(7.3)	(7.4)
	Log(Wage rate) Outcome	Selection	Log(Work hour) Outcome	Selection
Union coverage	0.277*** (0.029)		0.060*** (0.018)	
Labor contract	0.062*** (0.009)		0.022*** (0.005)	
Union coverage*Labor contract	0.099*** (0.036)		-0.033 (0.021)	
Gender	0.114*** (0.003)	0.035*** (0.011)	0.017*** (0.002)	0.043*** (0.011)
Age	0.046*** (0.005)	-0.085*** (0.021)	0.005* (0.003)	-0.080*** (0.021)
Age squared	-0.0008*** (0.0001)	0.004*** (0.0005)	-9.04E-05 (0.0001)	0.004*** (0.0005)
Household head		0.414*** (0.029)		0.363*** (0.029)
Marital status		0.258*** (0.014)		0.249*** (0.014)
<i>Additional control</i>				
Educational level	Yes	Yes	Yes	Yes
Work experience	Yes	No	Yes	No
Job sector	Yes	No	Yes	No
Year-specific effect	Yes	No	Yes	No
Industry-specific effect	Yes	No	Yes	No
Number of observations	81,619	81,619	81,619	81,619
Log pseudolikelihood	-48,953		-10,651	
Wald test of independent equations	255.3		59.9	

Table 7.
Complementary effect
of union coverage and
labor contract
(Addressing
selection bias)

Note(s): Robust standards errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source(s): Authors' estimation based on the Heckman two-part procedure

terms of having labor contract and social insurance. In particular, one-percent increase in union coverage raises the youth's probability of having contract and social insurance by 0.19 and 0.32 percent, respectively. *Third*, union coverage is complementary to individual labor contract in determining the youth's wage rate, not work hour. These three empirical results are robust to selection bias exhibited by the youth in the labor market.

This paper contributes to the related literature of collective bargaining and youth employment, a cohort distinguished with high unemployment and high job turnovers. That our empirical results indicate positive associations between union coverage and the youth's multi-dimensional labor market outcomes would contribute to this young age cohort's smooth school-to-work transition, provided that the role of trade union is challenged both in developing and developed countries. Venues for further studies could be the relationship between collective bargaining and rent sharing, given increasing investment at firm level in developing countries.

Notes

1. Details about content and methodology of the PCI survey could be found at <http://orgeng.pcivietnam.vn/about/about-pci/>
2. We do not control for province-fixed effects since union coverage at province level could to some extent account for the level of socio-economic development across provinces.
3. The average marginal effect of one unit change in union coverage is equal to $\varphi(\text{intercept term} + \alpha \cdot \text{Union coverage}) \cdot \alpha$, where $\varphi(\text{intercept term} + \alpha \cdot \text{Union coverage})$ is the standard normal probability density function evaluated at $(\text{intercept term} + \alpha \cdot \text{Union coverage})$. In this calculation, intercept term and α are coefficients estimated from Eqn (2) in the empirical strategy section above.

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Corresponding author

Thang Ngoc Bach can be contacted at: bnthang@gmail.com