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Health insurance and self-employment transitions in Vietnam

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Abstract

Health insurance can have important effects on self-employment and self-employment transitions. However, there is a literature gap on the relationship between health insurance and self-employment in low and middle income countries, especially in the context of rapid expansion of health insurance in these countries. This paper examines this relationship in Vietnam with a focus on the comparison between the voluntary scheme for the informal sector (mostly self-employed workers) and the compulsory insurance for the formal sector (mostly wage workers). We employ a Probit model with selection on a panel from the Vietnamese Household Living Standards Surveys 2010-2014 to investigate the association between health insurance and self-employment entry and exit. We show that those with compulsory health insurance in Vietnam, the formal workers, are 10 percentage points less likely to enter self-employment compared to those having voluntary insurance. Regarding self-employment exit, people with compulsory insurance are more likely to exit self-employment compared to those covered by voluntary insurance. However, the effect size is relatively small.

JEL Classifications: I13, J22

Keywords: health insurance, self-employment, Vietnam,
self-employment entry, self-employment exit

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1 Introduction

There is a difference in the coverage rate of health insurance between self-employed workers and wage earners in Vietnam. This is largely a result of the gap in the coverage rate between formal and informal workers (Somanathan et al., 2014), whereby the self-employed in Vietnam are overly represented by informal workers (Cling et al., 2011) while those in the formal sector are often wage employees and public workers. In 2011, informal workers and their families represented around 50 percent of those uncovered in Vietnam while this share of formal workers was around 19 percent (Somanathan et al., 2014). The enrolment rate into health insurance of informal workers in 2011 was only 26 percent compared to 56 percent of formal ones (ibid.). Even though the current health insurance system has been pooled into a single programme called Social Health Insurance (SHI), it still inherits the targeting approach from its predecessors which depend on employment status for working-age individuals who are not assistance recipients. Therefore, different employment groups get enrolled into the SHI programme via different sub-schemes with different enforcement mechanisms. Formal workers get enrolled via the compulsory scheme while informal workers have an option to join via the voluntary scheme. As a formal worker, one would get the insurance coverage via his or her employers, in which two thirds of health insurance premiums are paid by employers out of the payroll (employees have to pay one third of the amount). On the contrary, informal workers have to pay for the premium out-of-pocket at a local insurance agency (see the description of the Vietnamese health insurance system for more details). Even though the two schemes share the same benefit package in SHI, this design has consequently led to the aforementioned discrepancy in enforcement between the formal and informal sector, possibly due to adverse selection among informal workers (Somanathan et al., 2014). Notably, even in the formal sector, where health insurance coverage is compulsory by law, compliance is still an issue (ibid.), not to say anything about the voluntary scheme where there is no such enforcement mechanism. Additionally, the lack of health insurance literacy in Vietnam (Somanathan et al., 2014) may be another reason for the weaker enforcement of the voluntary insurance compared to the compulsory scheme. This leads one to argue that Vietnamese formal workers are more likely to have health insurance compared to those working in the informal sector. This enforcement issue creates a link between health insurance coverage and the institutional sector (formal/informal), which is then translated into a link between health insurance and employment category (i.e. self and wage employment) due to the structure of the Vietnamese labour market.

The relationship between health insurance and the nexus of self and wage employment (especially self-employment mobility) is an important policy issue because of its potential impact on the labour market. One of the growing concerns is about ‘entrepreneurship lock’ (Fairlie et al., 2011), which is believed to keep people in wage employment and hence potentially reduce job search and job matching, triggering labour market inefficiencies by impeding entrepreneurial activities if health insurance is linked to wage employment (Gumus and Regan, 2015). The term was coined by Fairlie et al. (2011) to distinguish it from ‘job lock’ (i.e. the effect of health insurance on job mobility in general). This perspective is influenced by the job-lock literature pioneered by Madrian (1994) and Gruber and Madrian (1994) on the American labour market, which, in turn, is based on the idea of the job matching component of productivity by Jovanovic (1979). It is argued that the productivity of the whole economy is reduced if a better job match is impeded because someone who wants to move chooses to stay in his or her current job just

because of the health benefit attached (Madrian, 1994). In that logic, Holtz-Eakin et al. (1996) examine the effect of health insurance on entrepreneurial activity and hypothesise that employer-sponsored health insurance impedes people from leaving their wage job for self-employment. However, he finds no significant evidence to support the hypothesis (Holtz-Eakin et al., 1996). Since then, the body of literature on entrepreneurship lock has been developed further with several studies on the US. In examining labour force transition in the middle age, Zissimopoulos and Karoly (2007) study working individuals aged over 51 and suggest that having a retirement health coverage in the current job reduces the likelihood of moving into self-employment in the next period. However, Zissimopoulos and Karoly (2007) investigate the effects of many factors on the transition to self-employment rather than mainly focusing on health insurance. Fairlie et al. (2011) use a regression discontinuity approach to examine the effect of employer-provided health insurance on entrepreneurship in the elderly group at the retirement age cut-off of 65 and find an increase in the business ownership rate from just under to just above 65 years old. Outside the US, Fossen and König (2017) suggest that the public health insurance scheme in Germany, which is only mandatory for public sector workers, tends to decrease the probability of self-employment entry. They find that a cost difference in health insurance premium of 10 Euro per month can reduce the annual entry rate by 1.7 percent (Fossen and König, 2017). Contrary to the entrepreneurship lock argument, health insurance can also have an entrepreneurship promotion effect, depending on the portability of the health insurance package (i.e. whether health insurance is tied to employment or not) (Le et al., 2019). Health insurance access either via the employer or a spousal package has been shown to be a significant determinant of being self-employed (Wellington, 2001; Gai and Minniti, 2015). Health insurance reforms that improve access to health insurance for the self-employed through fiscal tools (tax deductibility or tax subsidies) have been shown to increase the probability of self-employment (Heim and Lurie, 2010; Velamuri, 2012; Gumus and Regan, 2015). Similarly, state-level coverage expansion has been found to promote self-employment (Niu, 2014; DeCicca, 2007). In another study on 28 countries in Eastern Europe and Central Asia, Wagstaff and Moreno-Serra (2015) use aggregate data for the period 1990-2004 to show that social health insurance expansion seems to increase the self-employment share of total employment.

Despite its important policy implications, the effect of health insurance on self-employment and self-employment mobility in low and middle income countries (LMIC) is rather under-researched (Le et al., 2019). The high level of formal self-employment of the American economy is rather distinctive from the situation in low and middle income economies, which are often characterised by large proportions of informal self-employment. Importantly, the finding for Germany (Fossen and König, 2017) suggests that even in a country with universal health coverage, the health insurance differential between employment categories can negatively affect self-employment entry and hinder labour market efficiency. In other words, the entrepreneurship lock is not exclusively relevant for the American health system where health insurance is tied to employment. This raises the question of the relationship between health insurance and self-employment mobility in other health systems where health insurance schemes differ between wage and self-employment. Besides, the rapid expansion of health insurance coverage in LMIC (Rodin and de Ferranti, 2012; Lagomarsino et al., 2012) and the vital role of self-employment in these economies (Gindling and Newhouse, 2014) highlight the urgent need for more research on this issue. For Vietnam, given the role of the self-employment sector in the country - accounting for more than 58 percent of total employment in 2017

(World Bank, 2018) - coupled with the aforementioned gap in health insurance coverage between self-employed workers and wage earners (Somanathan et al., 2014), it is relevant to investigate the association between insurance and self-employment.

This paper examines the relationship between health insurance and self-employment mobility in Vietnam with a focus on the comparison between the voluntary scheme for the informal sector (mostly self-employed workers) and the compulsory scheme for the formal sector (mostly wage workers). We employ a Probit model with selection on a panel from the Vietnamese Household Living Standards Surveys (VHLSS) 2010-2014 to investigate the association between health insurance coverage and self-employment entry and exit over time. To our knowledge, this study will be the first to shed some lights on this topic in Vietnam.

2 The Vietnamese health insurance system

In Vietnam, the first social health insurance was introduced as a compulsory contribution-based scheme in 1992 for the formal sector to include public servants, people working in state-owned enterprises and private companies (Palmer, 2014). Since then, different schemes have been introduced to different groups of the population. Finally, in 2008, all schemes were consolidated into one national SHI programme under the first Health Insurance Law (Socialist Republic of Vietnam, 2008). The latest policy change was the Health Insurance Law Amendment in 2014 (Socialist Republic of Vietnam, 2014) which revised some of the articles in the previous bill and explicitly endorsed universal health coverage by stating that ‘health insurance is compulsory for all individuals under this law’ (Article 1, Health Insurance Law, 2014). Until 2014, the last period of this study, the majority of insurance holders were part of the SHI under different categories which used to form its predecessors. These included compulsory insurance for the formal sector, free health insurance for the poor, subsidized insurance for the near-poor, free insurance for social assistance recipients (the disabled, veterans and mothers of war martyrs), free insurance for children under six, voluntary insurance for students, the informal self-employed (i.e. farmers and non-farm self-employed workers) and dependants of those in the compulsory scheme. In addition to the SHI, there were also other types of health insurance in the financial market. However, these were often more expensive and exclusively for those who could afford it. These insurances were not managed by the public system and we unfortunately do not have data about their share in the total enrolment.

Despite all schemes having been pooled into one single payment programme, its management remains fragmented (Somanathan et al., 2014), with differences in enforcement mechanism, premium and co-payment rate (see Health Insurance Laws in 2008 and 2014). Due to the enforcement issue (Somanathan et al., 2014), the government has been trying to increase the coverage rate via many policy reforms. The current system uses a diminishing premium rate, with the premium being increasingly lower for the next family member who get enrolled into the SHI. For the compulsory and voluntary insurance schemes, different salary bases and contribution rates are used. Formal employees are required to contribute two percent of their salary (the remaining four percent are paid by their employers) (Socialist Republic of Vietnam, 2014). By contrast, those covered by the voluntary scheme, contribute six percent of the minimum wage of the public sector (ibid.). The diminishing premium rate then applies to the next enrollee in the family.

Due to this dynamic premium formula, it is not straightforward to quantify if the formal or informal workers are paying more in insurance premium. We, however, have evidence of an enforcement gap between the two schemes (Somanathan et al., 2014).

3 Data and Methodology

We use a panel from the Vietnamese Household Living Standards Surveys (VHLSS) 2010-2014. VHLSS is a representative household survey conducted every two years to collect individual level data on many topics including health, labour, demographics and so on. However, because of the broad purpose, the surveys do not have detailed information on job characteristics, spousal characteristics (Zissimopoulos and Karoly, 2007) or risk attitude (Van Praag and Cramer, 2001), which have been shown to significantly affect self-employment.

Each survey round collects information of around 9,000 households in 3,000 communes in Vietnam. To ensure the representativeness of each cross-section, a rotating approach is used wherein only half of the sample each wave is repeated in the next wave. This significantly reduces the sample size when the panel structure is used. After data cleaning and verification, the original panel includes approximately 1,850 households each wave. We only examine individuals aged 16-65 and individuals surveyed in all three periods. Notably, it is not possible to separate students aged above 16 in the working-age sample because the surveys in 2010 and 2012 did not ask why someone was not working over the last 12 months. Therefore, after attrition checks, we use the legal working age cut-off in Vietnam (16 years old) and the universally accepted working age (16-65) in the literature to draw a sub-sample of working-age people. The panel of working-age individuals has 4,047 observations in 2010, 4,226 observations in 2012 and 4,047 observations in 2014.

In this paper, we define someone as self-employed (SE) if the person reported working as a self-employed worker ‘over the last 12 months’ (either in agriculture or the non-farm sector). Unlike the self-employment sector in advanced countries, which is mainly represented by formal workers and entrepreneurs, this employment category in LMIC denotes a complex taxonomy. This includes farmers, own account workers, unregistered workers working in household businesses (the informal workers) and formal entrepreneurs (the formal workers). Unfortunately, the data allow us to separate the self-employed by industry (farm and non-farm) but not by legal status (formal/informal). This data limitation implies more caution in interpreting our results because the eligibility of the two health insurance schemes of interest (voluntary and compulsory insurance) is mainly based on the legal status of the employee. Wage employment (WE) and dual employment (DE, i.e. engaged in both self-employment and wage employment simultaneously) are specified based on the self-reported work status ‘over the last 12 months’.

We define SE entry and exit based on work transitions from year t to year $t+1$ (i.e. transitions between 2010-2012 and 2012-2014). In particular, entry into SE is defined as a dummy variable, taking the value of 1 if a person moves from WE or DE in year t to SE in year $t+1$. SE entry takes the value of 0 if the individual stayed in WE or DE for both periods t and $t+1$. Similarly, SE exit is defined as a dummy to indicate the transition from SE in year t to WE or DE in year $t+1$. SE exit equates 0 if the person stayed in SE in both years t and $t+1$. After tracking the SE transitions, we only keep the observations in the baseline years (two cross-sections in 2010 and 2012).

As work transition depends on the original status (i.e. working or not working), we use a Probit model with sample selection by Van de Ven and Van Praag (1981) to account for selection into the labour market. In a nutshell, this model mimics the Heckman correction (Heckman, 1979), which is designed for explaining a non-dichotomous variable, to apply into a Probit model with a dichotomous variable. However, Van de Ven and Van Praag (1981) use both maximum likelihood and two-stage estimators for comparison to avoid the disadvantages of the Heckman’s two-stage estimator. This model has two equations, a selection equation that models the selectivity into the labour market and an outcome equation for SE transitions. For identification, the model requires that the selection equation has at least one exogenous variable that is not in the outcome equation (i.e. identification variable). We use the dummy variable of employment status in 2010 (i.e. the lag value of employment status in 2012) as an identification variable in this research. There are reasons to assume that the labour force participation in 2010 affects that of 2012. Once a person is in the labour market, his/her employment transition in 2012 does not depend on the labour force participation in the previous time period in 2010. This use of lag variable reduces the final sample to only include regressors from one time period (2012). The final sample for our analysis consists of 4,226 working individuals in 2012.

Because SE in Vietnam comprises both formal and informal sectors while voluntary insurance is designed for the informal self-employed, the underlying mechanism of employment mobility (or immobility) in the case of entrepreneurship lock (if any) can be varied and aligns with the process of formalisation. We expect that those with a compulsory health insurance in the formal sector (i.e. those working in the public sector or in the formal private sector) will have the tendency to stay in WE or DE, whereas those with a voluntary health insurance (farmers and the informal self-employed in the non-farm sector) are expected to be more likely to move out of SE to WE or DE with a more secured health scheme. The mechanisms are summarised in Table 1.

Table 1: Entrepreneurship lock mechanisms

Movement	Mechanisms	Variable
	-Informal WE to formal WE	
Stay in WE/DE	-Informal WE to DE (at least one job is formal)	Entry=0
	-Informal DE (both jobs are informal) to formal WE	
	-DE (both are informal) to DE (at least one job is formal)	
SE exit	-Informal SE to DE (at least one job is formal)	Exit=1
	-Informal SE to formal WE	

SE : Self-employment only, WE : Wage employment only, DE : Dual employment

Using lag of labour force participation as the identification variable, in the main equation, we regress SE entry and exit on health insurance coverage, individual and household characteristics in the baseline, such as gender, marital status, educational attainment, the annual healthcare utilisation (proxied for health status), income per capita per month, household size, dependency ratio ¹, work industry (agriculture/non-agriculture). To account for the seasonal effect, we also control for the interview month. Notably, we do not have information on health status, therefore it is proxied by health

¹ Dependency ratio is defined as the total number of children under 16 and elderly family members above 65 divided by the household size.

care utilization. We only use the first type of health insurance reported for this analysis as the majority of the surveyed people only have one health insurance scheme.

4 Results

4.1 Descriptive statistics

Health insurance coverage

Table 2 provides information on health insurance coverage in Vietnam during 2010-2014. As suggested, health insurance was expanding rapidly during the period, from nearly 60 to 76 percent of the total population. Coverage also increased sharply for working-age people, from around 47 percent in 2010 to 58 percent in 2014. However, despite the rapid pace of coverage expansion, the results seem to be consistent with that of Somanathan et al. (2014) regarding the low enforcement of SHI, especially the contribution-based schemes (voluntary and compulsory schemes). Importantly, other types of private insurance outside the SHI programme were more popular than these contribution-based schemes, suggesting that the SHI programme might not be well received by the general public. This is explained by the observation that people do not have trust in the effectiveness of the system (Somanathan et al., 2014).

Table 2: Health insurance coverage 2010-2014 (%)

	2010	2012	2014
Total population			
No insurance	41.37	36.99	33.07
Free health insurance for children under 6	8.23	5.81	3.22
Subsidized health insurance for the poor and the near poor*	14.07	16.87	16.07
Free Health insurance for assistance recipients	5.61	6.46	9.64
Compulsory health insurance for the formal sector	9.63	10.63	11.12
Voluntary insurance	6.78	7.83	10.75
Others (private insurances)	14.31	15.41	16.13
Number of observations	6,061	6,090	5,636
Working-age population			
No insurance	52.55	46.90	41.57
Subsidized health insurance for the poor and the near poor*	14.13	16.06	14.99
Free health insurance for assistance recipients	5.07	5.78	8.80
Compulsory health insurance for the formal sector	12.81	13.57	14.17
Voluntary insurance	8.37	9.49	12.85
Others (private insurance)	7.07	8.21	7.63
Number of observations	4,047	4,226	4,047

Weighted statistics. In this paper, we only use the first type of health insurance reported.* Until 2014, the poor were entitled to free health insurance, while the near-poor could benefit from a half-price premium reduction.

The self-employed in Vietnam

Table 3 shows the employment categories in Vietnam during 2010-2014 using the final panel of the working-age population. Similar to other LMIC, Vietnam is characterised

by a large share of self-employment, at approximately 54 to 55 percent of total working population during 2010 and 2014. Another important feature is the role of dual employment which makes up around 22 percent of the total working population.

Table 3: Employment categories 2010-2014 (%)

Year	2010	2012	2014
Total sample (working-age population)	4,047	4,226	4,047
Working population rate	84.53	83.64	82.83
Total sample of the working population	3,454	3,550	3,397
WE only	24.07	24.38	24.71
DE	22.44	21.22	22.05
SE only	53.49	54.41	53.24

DE (Dual employment) denotes the combination of both WE and SE. Weighted statistics.

Table 4 provides information on the self-employed in Vietnam. As discussed in section 3, the SE sector in a developing country like Vietnam does not only include formal entrepreneurs - the concept of SE is broader and also comprises farmers, own account workers, and employees working for household businesses. Therefore, among those engaging in SE in Vietnam (both DE and SE only) during 2010-2014, only about 30-32 percent worked in the non-farm sector while around 68-70 percent were in agriculture. This suggests the dominance of farmers, own account workers and employees in agricultural household businesses in the self-employed population. Additionally, because the majority of agricultural household businesses in Vietnam are informal (Cling et al., 2011) while farmers and own account workers are informal by definition, the self-employed population in our data mostly represents informal workers. This is consistent with Cling et al. (2011) who suggest that a majority of the self-employed in Vietnam is in the informal sector. This is an important finding given that data limitations do not allow us to distinguish formal workers from informal ones within the self-employed. Therefore, the voluntary health insurance scheme which is designed for informal workers is actually targeted to the informal self-employed.

Table 4: The profile of the self-employed in Vietnam 2010-2014 (%)

Year	2010	2012	2014
By sector			
SE in agriculture	68.27	69.99	68.64
SE in the non-farm sector	31.73	30.01	31.36
Total	100	100	100
By sector and employment category			
- SE only in agriculture	41.50	44.06	42.37
- DE (with SE in agriculture)	26.76	25.93	26.27
- SE only in the non-farm sector	28.95	27.89	28.34
- DE (with SE in the non-farm sector)	2.79	2.12	3.02
Total	100	100	100
Total sample of those engaged in SE *	2,697	2,738	2,632

Weighted statistics. DE denotes the combination of both WE and SE. * This includes both DE and sole SE.

Employment mobility in Vietnam

Table 5 shows the patterns of mobility in employment status in Vietnam during 2012-2014. As illustrated, the rigidity of the economy was relatively strong. After two years between 2012 and 2014, more than 85 percent of the working population stayed in the same sector, whereas as only 14 percent entered or exited SE. The rigidity is the most pronounced among the formal workers: nearly 97 percent did not enter SE. This is reasonable as SE jobs in Vietnam are mostly in the informal sector (farmers, informal household businesses), it is sensible that those with a formal jobs - which are better off with more social protection - do not want to quit for SE opportunities.

Table 5: Self-employment entry and exit 2012-2014 (%)

	SE entry		SE exit		Total
	Stay in DE/WE	SE entry	Stay in SE	SE exit	
No insurance	80.48	19.52	86.64	13.36	100
Health insurance for the poor and the near poor	82.67	17.33	82.78	17.22	100
Health insurance for assistance recipients	72.98	27.02	86.36	13.64	100
Compulsory insurance in the formal sector	96.93	3.07	72.73	27.27	100
Voluntary health insurance	87.15	12.85	86.79	13.21	100
Others (private insurance)	88.35	11.65	79.76	20.24	100
Total	85.87	14.13	85.51	14.49	100
Observations	1199	197	1519	257	1,396

Weighted statistics. The number of observations is rounded up. This uses the final sample of 2012 after tracking SE transitions and only includes those participating in the labour force. SE entry (or exit) is defined as moving into (or out of) SE from (or to) WE or DE.

4.2 Estimation results

Tables 6-7 show the results of SE transitions during 2012-2014 (coefficients reported). Table 8 reports the average marginal effects conditional on the selection into the labour market. We use maximum-likelihood estimation for asymptotic efficiency and estimate clustered standard errors on the household level.

As suggested in Tables 6-7, we reject the null hypothesis of independent equations (P values of entry and exit regressions are 0.082 and 0.024). In other words, the selectivity is confirmed for both SE entry and exit. Table 6 suggests that if conditional on the participation in the labour market, those having compulsory health insurance (the formal workers) in 2012 are significantly less likely to move into SE in 2014 compared to those with voluntary insurance (the informal workers). In particular, on average, people with compulsory insurance are 10 percentage points less likely to move into SE in the next time period (see Table 8). This effect is significant at five significance level. Regarding SE exit, those having compulsory insurance are more likely to exit SE compared to those covered by voluntary insurance (see Table 7). This effect is statistically significant at five percent significance level. However, the effect size (average marginal effect conditional on labour force participation) is relatively negligible (see Table 8).

Table 6: Probit Selection Model - SE entry

Dependent variable	Selection equation	Main equation
	LFP	SE entry
Age squared	-0.004*** (0.00)	0.000 (0.00)
Age	0.264*** (0.04)	0.003 (0.04)
Male	0.739*** (0.12)	-0.169* (0.10)
Household size	-0.095** (0.04)	-0.008 (0.04)
Dependency ratio	0.136 (0.36)	0.155 (0.29)
Marital status (base: married individuals)		
-Single	-0.179 (0.20)	-0.094 (0.18)
-Widowed/ Divorced/ Separated	0.145 (0.28)	-0.395 (0.26)
Number of health care utilization per year	-0.135 (0.09)	0.030 (0.08)
Urban(dummy)	-0.119 (0.13)	-0.130 (0.13)
Monthly income per capita (in millions VND)	-0.045 (0.05)	0.013 (0.05)
Health insurance (base: voluntary insurance)		
-No insurance	0.332 (0.21)	0.287 (0.21)
-Health insurance for the poor and the near poor	0.322 (0.24)	0.279 (0.23)
-Health insurance for assistance recipients	0.059 (0.31)	0.364 (0.28)
-Compulsory insurance in the formal sector	1.361*** (0.24)	-0.550** (0.27)
-Others (private insurance)	-1.094*** (0.35)	-0.380 (0.59)
Work in agri/aquaculture sector	7.385*** (0.42)	0.461*** (0.12)
Labour force participation in 2010 (identification variable)	1.821***	
Number of observations	1,832	1,832
Wald test of independent equations		
ρ		0.327
P value (Probability $> \chi^2$)		0.082

LFP: Labour force participation. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Educational attainment and month of interview are included and statistically significant. Coefficients reported. Standard errors are clustered on the household. Maximum likelihood estimation is used.

Table 7: Probit Selection Model - SE exit

Dependent variable	Selection equation	Main equation
	LFP	SE exit
Age squared	-0.003*** (0.00)	-0.001** (0.00)
Age	0.243*** (0.04)	0.038 (0.03)
Male	0.178 (0.12)	0.312*** (0.08)
Household size	-0.082* (0.05)	-0.068** (0.03)
Dependency ratio	0.175 (0.32)	-0.239 (0.24)
Marital status (base: married individuals)		
-Single	-0.761*** (0.23)	0.346* (0.19)
-Widowed/ Divorced/ Separated	-0.365* (0.22)	0.212 (0.19)
Number of health care utilization per year	-0.086 (0.09)	-0.007 (0.06)
Urban(dummy)	0.006 (0.13)	-0.165 (0.12)
Monthly income per capita (in millions VND)	0.073* (0.04)	-0.057* (0.03)
Health insurance (base: voluntary insurance)		
-No insurance	0.212 (0.18)	-0.111 (0.13)
-Health insurance for the poor and the near poor	-0.240 (0.24)	-0.082 (0.17)
-Health insurance for assistance recipients	-0.343 (0.27)	-0.008 (0.19)
-Compulsory insurance in the formal sector	-0.891** (0.36)	0.712** (0.33)
-Others (private insurance)	-0.601* (0.31)	-0.121 (0.28)
Work in agri/aquaculture sector	9.397*** (0.25)	0.171 (0.11)
Labour force participation in 2010 (identification variable)	2.130***	
Number of observations	2,156	2,156
Wald test of independent equations		
ρ		0.397
P value (Probability $> \chi^2$)		0.024

LFP: Labour force participation. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Educational attainment and month of interview are included and statistically significant. Coefficients reported. Standard errors are clustered on the household. Maximum likelihood estimation is used.

Table 8: Average marginal effect (conditional on selection into the labour market)

	SE entry	SE exit
Age	0.004*** (0.00)	-0.005 (0.05)
Male	-0.056** (0.02)	0.069 (0.70)
Household size	0.001 (0.01)	-0.014 (0.16)
Dependency ratio	0.030 (0.06)	-0.062 (0.48)
Marital status (base: married individuals)		
-Single	-0.016 (0.04)	0.000 (0.000)
-Widowed/ Divorced/ Separated	-0.077* (0.04)	0.000 (0.000)
Number of health care utilization per year	0.010 (0.02)	0.001 (0.05)
Urban(dummy)	-0.025 (0.03)	-0.039 (0.36)
Monthly income per capita (in millions VND)	0.004 (0.01)	-0.016 (0.12)
Health insurance (base: voluntary insurance)		
-No insurance	0.057 (0.05)	0.000 (0.000)
-Health insurance for the poor and the near poor	0.055 (0.05)	0.000 (0.000)
-Health insurance for assistance recipients	0.086 (0.07)	0.000 (0.000)
-Compulsory insurance in the formal sector	-0.102** (0.05)	0.000 (0.000)
-Others (private insurance)	-0.037 (0.10)	0.000 (0.000)
Work in agri/aquaculture sector	-0.090 (0.11)	-0.240 (4.73)
Labour force participation in 2010 (identification variable)	-0.047 (0.03)	-0.064 (1.04)
Number of observations	1,832	2,156

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Educational attainment and month of interview are included and statistically significant. Standard errors are clustered on the household. Maximum likelihood estimation is used.

5 Robustness checks

Endogeneity of health insurance

One concern is the potential endogeneity of health insurance as there is averse selection in enrolling into the SHI programme, especially for those who sign up for

voluntary insurance (Somanathan et al., 2014). One can argue that there are idiosyncratic shocks that may affect health insurance enrolment and income, which in turn, affects employment choices. Additionally, risk-taking behaviour, which was not controlled for in the above models due to data limitation, might affect health insurance enrolment while potentially affecting self-employment choices. Therefore, we conducted different endogeneity tests to address this concern. In particular, we used Wald tests for Probit regressions and Durbin-Wu Hausman tests for OLS regressions of SE entry and exit. We concluded that endogeneity of health insurance is not an issue in this research (see Appendices A1-A3 for more details)

Dual employment and wage employment

As DE and WE are necessarily different in essence. We also re-conducted the analysis that separate these two forms of employment (See Appendices A4 and A5). As suggested, there is no big difference between DE and WE regarding SE entry and exit. In general, all effect signs are consistent across different definitions of SE entry and exit. However, the effects are not statistically significant any more compared to the results in Tables 6-7. The loss of statistical significance is probably due to the reduction in sample size when we separate WE from DE.

6 Discussion

In this study, we have shown that health insurance has a strong association with SE entry. In particular, those insured by compulsory health insurance are less likely to enter SE compared to those having the voluntary insurance. On average, the probability of moving into SE relative to staying outside SE for those with compulsory insurance is around 10 percentage point less than that of people covered by voluntary insurance. The effect is statistically significant at five percent significance level and consistent with our hypothesis of entrepreneurship lock.

Regarding SE exit, those having compulsory insurance are more likely to exit SE compared to those covered by voluntary insurance. However, the average marginal effect is relatively negligible. We initially hypothesised that self-employed workers with voluntary insurance - those in the informal sector - are more likely to exit SE to find a more secure job with a more guaranteed health insurance. What we find is consistent with this hypothesis, but the average effect size is rather negligible. This might be due to the very small number of observations of these two insurance categories as our SE exit definition by default only includes self-employed workers in 2012 who were less likely to be covered in either of the schemes.

Albeit the small effect size (see Table 8), the significantly positive effect of compulsory insurance on SE exit suggests that self-employed workers with compulsory insurance in the formal sector are more likely to exit SE than the self-employed in the informal sector with voluntary insurance (farmers, own account workers, unregistered household employees). This suggests that it is easier for the formal self-employed to move out of the high risk sector and find other job opportunities in WE or DE while the informal self-employed are somehow stuck where they are. This is consistent with Gindling and Newhouse (2014) who suggest that the self-employed in developing countries are pushed into lower paid self-employment out of necessity rather than opportunity. This might be the case for Vietnam, since in our regressions we only controlled for educational attainment, excluding

many other important individual characteristics that determine SE exit like experience, social network and so on due to data limitations.

Because, to our knowledge, this is the first study that looks at the relationship between health insurance and self-employment in LMIC, it is difficult to compare our results with other studies which are mainly about the US. Additionally, health regimes are very varied even within LMIC, so any attempt to compare the results should be done with caution. Wagstaff and Moreno-Serra (2015)'s study on Central Asian and Eastern European countries with very similar SHI systems examines the issue from a macro perspective and hence is not necessarily comparable to our micro analysis. The closest study is by Zissimopoulos and Karoly (2007) who use a Multinomial Logit model and track the transition into SE from one data wave to the next. They suggest a 0.7 and 0.1 percentage point decrease in transition to SE for salary men and women. Fairlie et al. (2011) report an increase of 0.013 percentage points in transition into SE for the elderly at the age cut off of 65. These two studies seem to suggest very small effect sizes compared to our results - probably because they focus on older workers, while we examine the whole working-age population. It is intuitive that the effect size for the elderly is smaller than the general working-age population as the former are less likely to participate in the labour market in general and as a self-employee in particular.

Additionally, entrepreneurship lock is more relevant for the US (Zissimopoulos and Karoly, 2007; Fairlie et al., 2011) due to the institutional link between health insurance and employment. In Vietnam, the effect caused by health insurance might not be that strong by design, owing to the availability of the voluntary health insurance for informal workers. Therefore, our analysis might overestimate the effect size as it could not distinguish health insurance from other fringe benefits which are normally attached to formal jobs and the public sector. This is caused by data limitations, enabling us to capture only the correlation between health insurance and SE mobility rather than causality. Therefore, the interpretation of our results should emphasise that people with compulsory insurance are locked in WE and DE due to the benefits attached to the job (job security, other fringe benefits, income prospects), and that insurance coverage is just one reason among them.

The biggest limitation of this study lies in the potential omitted variable bias due to the cross-sectional nature of our analysis. Even though we have panel data, work transitions are not repeated over time for the same individual. Therefore, we took advantage of the panel structure by using the lag of employment as an identification variable in the selection equation ². However, the risk of omitted variable bias was not avoidable as we could not control for many characteristics (e.g. characteristics and employment status of the spouse, self-employment experience, risk attitude) which have been shown to impact SE decisions (Gai and Minniti, 2015; Van Praag and Cramer, 2001).

Despite the limitation, we can show the correlation between health insurance and SE mobility. In Vietnam, because SE is highly overlapping with the informal sector, this suggests a relationship between health insurance and the formality of employment. In other words, the design of the SHI that separates the formal sector from the informal sector, which then has been translated into the enforcement issue and coverage gap, seems to contribute to the rigidity of the labour market. Our evidence suggests that the differential between various health insurance schemes can may be associated with

² We also used the lag of health insurance to rule out the endogeneity of health insurance in the robustness checks.

self-employment mobility. The entrepreneurship lock effect is not necessarily a unique feature of the American health system where health insurance is exclusively locked to employment.

The labour market rigidity suggested leads one to discuss the potential economic inefficiency as well as the role of entrepreneurship in the Vietnamese economy. Based on the efficiency argument (Jovanovic, 1979), it is recommended to tackle the link between health insurance and employment. Even though the voluntary insurance for the informal workers is designed to remove this link, the weak enforcement of this scheme compared to the compulsory package seems to fortify this undesirable link in the labour market. Therefore, a financial incentive to encourage insurance enrolment might not be sufficient. Awareness raising, which has been shown to increase the willingness to pay for SHI premium (Nguyen and Hoang, 2017), is needed to tackle the enforcement issue. Additionally, efficiency improvement of the SHI system as well as improved quality of care is vital when people do not trust the effectiveness of SHI (Somanathan et al., 2014).

Moreover, one should be cautious in using the efficiency argument to promote self-employment in Vietnam because better job matching and more flexibility in an economy of high concentration of the informal sector might imply moving out of the formal sector. SE in Vietnam is normally associated with the informal sector with smaller firms/economic formations and less labour protection. By contrast, the related literature, due to its focus on the US with a very high level of economic formalisation, tend to ignore labour protection while promoting entrepreneurship with the aim of improving market efficiency and flexibility. With increasing concern regarding the erosion of labour protection due to weak compliance and disguised employment in LMIC (ILO, 2015), the policy choice may be pushing for the formalisation of the informal economy, combined with entrepreneurship promotion policies for the formal self-employment sector. In the context of Vietnam, where a large proportion of workers are working in the shadow economy (Cling et al., 2011), the transition toward the formal economy might be challenging in the short term. Therefore, in the short run, the focus should be on improving the depth and breath of the SHI coverage to discourage averse selection, tackling the enforcement issue of the voluntary scheme via a compulsory mandate to reduce the rigidity and inflexibility of the economy induced by health insurance benefits.

7 Conclusion

Even though the relationship between health insurance and self-employment mobility can have important labour market implications, we know very little about this in the context of LMIC. In this paper, we have used a Probit model with sample selection to estimate the association between health insurance in Vietnam and the mobility in and out of SE. Even though we are not able to identify causal effects, we show that those with compulsory health insurance in Vietnam, the formal workers, are less likely to start a business compared to those having voluntary insurance. The effect is partly explained by the higher enforcement of the compulsory health insurance scheme in Vietnam which made staying out of SE (often informal SE) a preferred choice. Regarding the effect of health insurance on SE exit, we find that those with compulsory insurance are more likely to exit SE (even though its average marginal effect is relatively small in size). The rigidity of the economy is highlighted, suggesting the need to tackle the enforcement issue of the SHI programme in Vietnam in addition to other labour policies.

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Appendices

Wald Test of endogeneity - Probit regression

We use the health insurance coverage in 2010 as an instrument variable for health insurance coverage in 2012 to test for this endogeneity issue. We assume that health insurance in the previous year (2010) is a strong determinant of whether the person will continue signing up for the health scheme in 2012, whereas it is not related to SE transitions. Variable ‘health insurance’ (categorical) is transformed into a dummy variable, which takes the value of 1 for compulsory insurance and 0 for voluntary insurance, other health schemes are removed.

As suggested in the Wald test results (see Table A1), we can not reject the null hypothesis of exogeneity of health insurance. In other words, the endogeneity of health insurance is not an issue and that a regular Probit regression would be appropriate.

Table A1: Probit with endogenous health insurance - First equation

	SE entry	SE exit
Instrumented: compulsory insurance (dummy)		
Instrument: Insurance status in 2010	0.048*** (0.01)	-0.004 (0.01)
Age squared	-0.000 (0.00)	0.000** (0.00)
Age	0.007 (0.02)	-0.031* (0.02)
Male	-0.111*** (0.04)	-0.007 (0.04)
Household size	0.047*** (0.02)	-0.012 (0.02)
Dependency ratio	-0.058 (0.11)	0.009 (0.12)
Marital status (base: married individuals)		
-Single	-0.106 (0.07)	-0.056 (0.12)
-Widowed/ Divorced/ Separated	-0.101 (0.10)	0.036 (0.09)
Number of health care utilization per year	-0.020 (0.03)	-0.060** (0.03)
Urban(dummy)	-0.008 (0.04)	0.037 (0.05)
Monthly income per capita (in millions VND)	0.047*** (0.01)	-0.000 (0.01)
Work in agri/aquaculture sector	-0.332*** (0.06)	0.112*** (0.04)
Number of observations	327	228

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Educational attainment and interview month are included. Variable ‘health insurance’ (categorical) is transformed into a dummy variable, which takes the value of 1 for compulsory insurance and 0 for voluntary insurance, other health schemes are removed. Coefficients reported.

Table A2: Probit with endogenous health insurance - Main equation

	SE entry	SE exit
Dependent variable: SE entry (SE exit)		
Compulsory insurance (dummy)	0.904 (1.22)	3.753*** (0.37)
Age squared	0.001 (0.00)	-0.002 (0.00)
Age	-0.080 (0.12)	0.094 (0.09)
Male	0.842** (0.33)	0.130 (0.25)
Household size	-0.071 (0.12)	0.005 (0.10)
Dependency ratio	-0.089 (0.70)	-0.004 (0.47)
Marital status (base: married individuals)		
-Single	0.246 (0.55)	0.113 (0.54)
-Widowed/ Divorced/ Separated	0.215 (0.71)	-0.044 (0.41)
Number of health care utilization per year	0.219 (0.17)	0.238** (0.10)
Urban(dummy)	-0.205 (0.31)	-0.096 (0.22)
Monthly income per capita (in millions VND)	-0.218* (0.13)	-0.008 (0.04)
Work in agri/aquaculture sector	1.359*** (0.44)	-0.298 (0.33)
Number of observations	327	228
Wald test, null hypothesis: exogeneity of compulsory insurance		
P value (Probability $> \chi^2$)	0.4017	0.3603

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Educational attainment and interview month are included. Variable 'health insurance' (categorical) is transformed into a dummy variable, which takes the value of 1 for compulsory insurance and 0 for voluntary insurance. Coefficients reported.

Durbin-Wu Hausman test of endogeneity - OLS

As suggested in the Durbin-Wu Hausman test results (see Table A3), we can not reject the null hypothesis of exogeneity of health insurance. In other words, the endogeneity of health insurance is not an issue in the OLS regressions.

Table A3: SE entry and exit - OLS with endogenous health insurance

	SE entry	SE exit
Dependent variable: SE entry (SE exit)		
Endogenous variable: Compulsory insurance (dummy)	0.078 (0.15)	2.012 (4.45)
Age squared	0.000 (0.00)	-0.001 (0.00)
Age	-0.010 (0.01)	0.040 (0.14)
Male	0.050** (0.02)	0.076 (0.10)
Household size	-0.002 (0.01)	0.006 (0.08)
Dependency ratio	0.002 (0.06)	-0.006 (0.25)
Marital status (base: married individuals)		
-Single	0.017 (0.04)	-0.046 (0.26)
-Widowed/ Divorced/ Separated	-0.008 (0.07)	-0.003 (0.24)
Number of health care utilization per year	0.019 (0.01)	0.151 (0.31)
Urban(dummy)	-0.012 (0.02)	-0.091 (0.28)
Monthly income per capita (in millions VND)	-0.009 (0.01)	-0.007 (0.02)
Work in agri/aquaculture sector	0.219*** (0.06)	-0.157 (0.56)
Number of observations	479	241
Tests of endogeneity, null hypothesis: compulsory insurance is exogenous		
Durbin : $\chi^2(1)$	0.726041	0.552309
P value	(0.3942)	(0.4574)
Wu-Hausman : F(1,216)	0.686156	0.496152
P value	(0.4079)	(0.4820)

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Educational attainment and interview month are included. Variable 'health insurance' (categorical) is transformed into a dummy variable, which takes the value of 1 for compulsory insurance and 0 for voluntary insurance.

Table A4: Probit Selection Model - Selection equation
Separating WE from DE

	Wage Employment		Dual Employment	
	SE entry	SE exit	SE entry	SE exit
Currently employed (dummy)				
Age squared	-0.003*** (0.00)	-0.003*** (0.00)	-0.005*** (0.00)	-0.003*** (0.00)
Age	0.233*** (0.04)	0.225*** (0.04)	0.394*** (0.07)	0.252*** (0.04)
Male	0.645*** (0.13)	0.144 (0.12)	0.734*** (0.20)	0.062 (0.12)
Household size	-0.062 (0.05)	-0.094* (0.05)	-0.306*** (0.07)	-0.096** (0.05)
Dependency ratio	0.103 (0.40)	0.212 (0.33)	0.221 (0.50)	0.141 (0.34)
Marital status (base: married individuals)				
-Single	-0.316 (0.23)	-0.845*** (0.25)	-0.672** (0.32)	-0.873*** (0.25)
-Widowed/ Divorced/ Separated	-0.017 (0.37)	-0.464* (0.24)	-0.339 (0.37)	-0.485** (0.24)
Number of health care utilization per year	-0.139 (0.11)	-0.093 (0.08)	-0.154 (0.12)	-0.111 (0.08)
Urban(dummy)	0.058 (0.13)	0.127 (0.13)	-0.596*** (0.20)	0.064 (0.13)
Monthly income per capita (in millions VND)	0.024 (0.05)	0.079** (0.04)	-0.172** (0.08)	0.086** (0.04)
Health insurance (base: voluntary insurance)				
-No insurance	0.492* (0.25)	0.180 (0.20)	0.225 (0.37)	0.179 (0.20)
-Health insurance for the poor and the near poor	0.181 (0.33)	-0.141 (0.27)	0.489 (0.44)	-0.102 (0.27)
-Health insurance for assistance recipients	0.587 (0.48)	0.090 (0.32)	-0.077 (0.53)	0.273 (0.37)
-Compulsory insurance in the formal sector	0.587** (0.27)	-1.293*** (0.36)	-0.125 (0.39)	-1.480*** (0.36)
-Others	-0.239 (0.29)	-0.477 (0.37)	-0.540 (0.60)	-0.457 (0.39)
Work in agri/aquaculture sector	8.037*** (0.48)	8.803*** (0.27)	9.492*** (0.69)	8.679*** (0.28)
Employment status in 2010 (identification variable)	1.563*** (0.14)	2.226*** (0.18)	2.884*** (0.30)	2.242*** (0.18)
Number of observations	1,080	1,965	1,098	2,107

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Educational attainment and interview month are included. Coefficients reported. Clustered standard errors on the household. Maximum likelihood estimation is used

**Table A5: Probit Selection Model - Main equation
Separating WE from DE**

	Wage Employment		Dual Employment	
	SE entry	SE exit	SE entry	SE exit
Age squared	-0.002 (0.00)	0.000 (0.00)	0.001 (0.00)	-0.001** (0.00)
Age	0.158 (0.11)	-0.023 (0.04)	-0.043 (0.05)	0.067* (0.03)
Male	0.221 (0.20)	0.481*** (0.14)	-0.315** (0.13)	0.242*** (0.09)
Household size	-0.094 (0.07)	-0.103** (0.05)	0.019 (0.05)	-0.064* (0.04)
Dependency ratio	-0.519 (0.58)	0.016 (0.38)	0.382 (0.38)	-0.295 (0.26)
Marital status (base: married individuals)				
-Single	-0.065 (0.24)	0.627*** (0.21)	0.042 (0.29)	0.207 (0.25)
-Widowed/ Divorced/ Separated	-0.072 (0.55)	-0.004 (0.37)	-0.572* (0.32)	0.222 (0.21)
Number of health care utilization per year	-0.017 (0.15)	0.058 (0.10)	0.001 (0.09)	0.000 (0.07)
Urban(dummy)	-0.125 (0.19)	0.210 (0.17)	0.011 (0.23)	-0.377** (0.16)
Monthly income per capita (in millions VND)	-0.096 (0.08)	0.027 (0.03)	0.086 (0.08)	-0.076* (0.04)
Health insurance (base: voluntary insurance)				
-No insurance	0.363 (0.40)	0.327 (0.26)	0.055 (0.30)	-0.015 (0.16)
-Health insurance for the poor and the near poor	-0.129 (0.53)	0.234 (0.33)	0.138 (0.33)	0.221 (0.19)
-Health insurance for assistance recipients	0.927 (0.75)	-0.383 (0.44)	-0.108 (0.40)	-0.089 (0.30)
-Compulsory insurance in the formal sector	-0.360 (0.45)	1.330*** (0.37)	-0.405 (0.41)	0.325 (0.38)
-Others	-0.005 (0.64)	0.631* (0.37)	-5.811*** (0.41)	0.385 (0.30)
Work in agri/aquaculture sector	0.460 (0.29)	-0.140 (0.17)	0.329** (0.16)	0.202 (0.14)
Number of observations	1,080	1,965	1,098	2,107
Wald tests of independence				
ρ	0.634	0.519	0.340	0.190
P value (Probability > χ^2)	0.271	0.148	0.283	0.481

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Educational attainment and interview month are included. Coefficients reported. Clustered standard errors on the household. Maximum likelihood estimation is used

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