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Who Suffers the Penalty?

A Panel Data Analysis of Earnings Gaps in Vietnam

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Abstract

In spite of its predominant economic weight in developing countries, little is known about informal sector income dynamics vis-à-vis the formal sector. Some works have been done in this field using household surveys, but they only consider some emerging Latin American countries and a few African countries. As a matter of consequence, there is still no way to generalize the (diverging) results to other part of the developing world. Taking advantage of the rich VHLSS dataset in Vietnam, in particular its three waves panel data (2002, 2004, 2006), we assess the magnitude of various formal/informal earnings gaps while addressing heterogeneity issues at three different levels: the worker, the job (wage employment vs. self-employment) and the earnings distribution.We estimate fixed effects and quantile regressions to control for unobserved individual characteristics. Our results suggest that the informal sector earnings gap highly depends on the workers' job status and on their relative position in the earnings distribution. Penalties may in some cases turn into premiums. By comparing our results with studies in other developing countries, we draw conclusions highlighting the Vietnam's labour market specificity.

JEL Classification: J21, J23, J24, J31, O17.

Keywords: informal employment, earnings gap, transition matrix, quantile regressions, panel data, Vietnam.

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1. Introduction

In spite of its predominant economic weight in developing countries, little is known about the informal sector's income dynamics vis-à-vis the formal sector. Some works have been done in this field using household surveys, but they only consider some emerging Latin American countries (Argentina, Brazil, Colombia and Mexico; Gong *et al*., 2004; Perry *et al*., 2007; Bargain et Kwenda, 2010) and more recently South Africa, Ghana and Tanzania for Africa (Falco *et al*., 2010). As a matter of consequence, there is still no way to generalize these (diverging) results to other parts of the developing world, in particular in countries where the informal sector is the most widespread (Sub-Saharan African, and more generally poor countries).

From a labour market perspective, two competing views regarding informality are at stake in the literature: the exclusion and the exit hypotheses, following Hirschman masterpiece (Perry *et al.*, 2007). The first one, also called the "dualist approach", is an extension of the works by Lewis (1954) and Harris and Todaro (1970). It is based on a dual labour market model where the informal sector is considered as a residual component of this market totally unrelated to the formal economy. It is a subsistence economy that only exists because the formal economy is incapable of providing enough jobs, condemned to disappear with the development process. Informal workers, suffering from poor labour conditions, are queuing for better jobs in the formal sector. The second one, also known as the "legalist approach" considers that the informal sector is made up of micro-entrepreneurs who prefer to operate informally to evade the economic regulations (de Soto, 1989); this conservative school of thought is in sharp contrast to the former in that the choice of informality is voluntary due to the exorbitant legalisation costs associated with formal status and registration.

Recent empirical evidence shows, however, that the real situation is a mix of these two hypotheses. Confirming Field's stylized assessment (1990), they stressed the huge heterogeneity among informal jobs, which combine two main components (Roubaud, 1994; Maloney, 1999, 2004; Perry *et al.*, 2007; Bargain and Kwenda, 2010): a lower-tier segment, where occupying an informal job is a constraint choice (exclusion hypothesis); an upper-tier segment, in which informal jobs are chosen for better earnings, and non-pecuniary benefits (exit hypothesis). Usually, the former segment is assimilated to the informal wage jobs, while the latter is associated with the self-employed jobs. Therefore, whether one segment is predominant over the other is an empirical question, depending on local circumstances. To test these alternative views, one major strand of literature focuses on the estimation of earning gaps. Embedded in reveled preferences principle, and considering income as a proxy of individual utility, the approach assumes that if informal workers earn more than their formal counterparts (controlling for observed and unobserved characteristics), one could have good presumptions that they have deliberately chosen the informal sector. This may not be true for all informal workers. Thus, the challenge is to identify segments of jobs (for instance by job status) or position in the income distribution where informal workers get a

higher pay. In this paper, our objective is to shed light on these alternative views in the case of Vietnam using the formal/informal earning gaps approach. We take advantage of the rich VHLSS dataset in Vietnam (a LSMS type household survey), in particular its three-wave panel data (2002-2004-2006), to ask the following questions: Is there an informal job earnings penalty? Do some informal jobs provide pecuniary premiums? Which ones? Do possible gaps vary along the earnings distribution?

The case of Vietnam is interesting because it has experienced spectacular social, economic and political changes in the recent period. Impressive economic growth of the last decade has entailed a remarkable drop in poverty figures, drastic changes of the labour market structure, but also a surge in earnings inequality as further trade liberalization and world integration have been developed. Although the formal sector of the economy has grown progressively, the steady dynamics and still important share of informal employment (two thirds of the labour force) – which is generally associated with poor working conditions – along with the increasing share of wage workers in total employment represent intriguing facets of the Vietnamese labour market. However, Cling *et al*. (2010a) provide a comparative analysis showing that Vietnam's informal sector shares many similarities with Africa's, despite numerous differences, especially in terms of development level and economic structure.

While most of the papers on this topic are drawn from (emerging) Latin American or African countries, Vietnam represents an interesting case. First, no previous analysis on this issue has been undertaken in this region of the world. Do Vietnam's specific circumstances (unique economic regime, role of the State, fast growing economy) make a difference? This topic is all the more relevant that it is directly linked to a key policy issue: a universal social insurance scheme is to be implemented in the coming years by the Socio-Economic Development Strategy (SEDS 2011-2020). Second, our work intends to complete the puzzle by broadening the spectrum of developing countries where the two alternative views can be assessed, in order to draw more general conclusions. In particular, does the exit option still hold in poorer countries?

Our empirical analysis consists of assessing the magnitude of different types of informal-formal earnings gaps using OLS and quantile regressions. We use a worker level definition of informality, the so-called informal/formal employment divide (Hussmanns, 2004). Standard earnings equations are estimated at the mean and at various conditional quantiles of the earnings distribution. In particular, we estimate fixed effects quantile regressions to control for unobserved individual characteristics, focusing particularly on heterogeneity within both the formal and informal employment categories. Our purpose is to address the important issue of heterogeneity at two levels: the worker level, taking into account individual unobserved characteristics; the job level, comparing wage workers with self-employed workers.

Our results suggest that the informal earnings gap highly depends on the workers' job status (wage employment vs. self-employment) and on their relative position in the earnings distribution. Penalties may in some cases turn into premiums. In particular, while informal workers suffer penalties vis-à-vis formal workers, this feature is mainly due to informal wage earners. In fact, informal self-employed workers receive a premium vis-à-vis formal wage workers, which is increasing along the pay ladder. Gender issues are also examined. By comparing our results with studies using similar methodologies in other developing countries, we draw conclusions highlighting the Vietnam's labour market specificity. This specificity puts Vietnam closer to Mexico (and to a lesser extend Brazil) than to South Africa, where the informal-formal gap, although decreasing along the earnings distribution, is always negative, even at the highest end of the distribution. Vietnam, although a much poorer country, already exhibits a more integrated labour market, which is a characteristic of emerging Latin American countries compared to the dualistic Sub-Saharan African countries. Finally, in spite of the unique nature of the Vietnamese economy and its contextual background, our results are in line with the literature, emphasizing the dual nature of informal jobs.

The remainder of this paper is organised as follows. Section 2 presents the context, the data and some descriptive elements of income dynamics in the recent period, while Section 3 focuses on the econometric approach to assess formal-informal earnings gaps. Empirical results are discussed in Section 4. Section 5 concludes.

2. Context, Labour Market Dynamics in Vietnam and Data

Context

The growth model embraced by Vietnam during the last two decades, in an urbanization context, has prompted deep social economic transformation. The private sector has been thriving with the transition of a centrally planned economy towards a "socialist-oriented market economy" since the Doi Moi (Renovation) launched in 1986. Economic growth has helped reduce poverty considerably but, in the meantime, spark increasing social inequality. The gap within a region and between urban and social areas has widened (VASS, 2010; Cling *et al.*, 2009). Market freedom, meanwhile, paved the way for the development of an informal economy.

On the labour market, two main striking features are at stake in recent years: first, the rising rate of wage and non agricultural employment; second, a sharp increase in real wages and labour incomes in recent years (Cling *et al.*, 2010b).

Vietnam's impressive economic growth over the last decade has triggered a sharp increase in the rate of wage employment: the rate rose from 19% in 1998 to 33% in 2006. Wage

employment grew particularly sharply in the industrial sector (including construction) during the last ten years.

This spread of wage employment has affected all population categories (urban, rural, male,female, skilled and unskilled), but substantial differences in level subsist. Wage employment is obviously more developed among the most skilled manpower (86% among the highly skilled as opposed to barely one-quarter among the unskilled), and it is also more prevalent among urban dwellers and among men (35% compared to 25% for women).

The spreading of wage employment on the Vietnamese labour market has been accompanied by a steep decline in agricultural employment. From 1998 to 2006, the share of agricultural jobs has been reduced by 18 percentage points, from 67% to 49%. This trend is due to a vibrant urbanization process[1]. But, at the same time, in all kinds of geographic areas, the proportion of out farm jobs has been on the rise, a shift particularly important in peri-urban areas (Cling *et al.,* 2010c). For instance, in the rural surroundings of the two biggest cities (Hanoi and Ho Chi Minh), agricultural employment has fallen down from 58% to 22% during the period.

Despite an important rate of underemployment, the second important feature of the Vietnamese labour market is that wages gradually rose from 1998 to 2006. Sharp economic growth prompted a 56% increase in wage earners' average annual remuneration over the period observed, which works out at an average annual growth rate of 5.7%. Real wages grew at a slower pace in agriculture than in other sectors over the period (28% vs. 34% and 78% for secondary sector and services; see Table 1). Wage dynamics was higher for the semi-skilled and high skilled workers than for unskilled workers (67%, 62% and 36% respectively). At the same time, the increase was lower for men than for women (respectively +51% and +60% from 1998 to 2006), mainly given the changes of the structure of the labour market (more in favour of female workers). This leaded to a reduction in gender inequalities to some extent (Cling *et al.*, 2009).

Table 1. Changes in labour structure and earnings in Vietnam, 1998-2006

	Jobs (%)				Real income (100 = 1998; wage only)			
Sector	**1998**	**2002**	**2004**	**2006**	**1998**	**2002**	**2004**	**2006**
Agriculture	67.1	56.5	52.0	49.2	100	96.2	107.4	128.3
Secondary sector	13.9	19.7	21.7	23.0	100	109.4	119.6	134.3
Services	19.0	23.8	26.3	27.8	100	146.1	158.3	177.7
Total	100	100	100	100	100	121.2	137.1	155.7
Wage workers	17.5	28.6	31.0	33.1	-	-	-	-

Source: VLSS 1998, VHLSS 2002, 2004 & 2006, GSO; authors' calculation.
Note: Secondary sector includes fishery, mining, manufacture and construction.

[1] According to the latest population census conducted in 2009, the population has been growing by 3.4% annually in urban areas over the last decade, compared to 0.4% per year in rural areas (GSO and UNFPA, 2009).

This context has brought a very optimistic view on the dynamism of the economy and of the labour market in Vietnam. Still, this analysis focuses only on the global trends and fails to take into consideration the informal economy. The on-going restructuring of the labour market clearly benefitted the non-farm private sector: the formal sector (both domestic and foreign enterprises) but also the household businesses, which the informal sector is the main part. The share of large enterprises in total labour force doubled, from a very low 4% in 1998 to 8% in 2006. In the meantime, non-farm businesses employment increased from 20% to 35% during the same period. In parallel, the informal jobs (those not covered by social insurance scheme) still represent a massive component of the economy. The Labour Force Survey conducted in 2007 gives a precise picture of these two dimensions of the informal economy (Cling *et al.*, 2010a). Informal sector jobs represent 23% of total jobs and nearly a half of non-farm jobs; informal jobs account for 82% of total jobs and two-thirds of non-farm jobs.

Whatever the growth hypotheses in the years to come, employment in the informal sector and its share in total employment will rise even without the economic downturn of 2008-2009. This phenomenon is due to the limited capacity of the private formal sector (even if it continues to grow with the same frantic rhythm as prior to the crisis) to absorb the new entrants in the labour market and the workers who move from agricultural to non-agricultural activities. Therefore, understanding better the informal employment dynamics is a key challenge to design policies aiming at protecting its workers, improving the labour conditions and increasing productivity, keeping with its intrinsic flexibility.

Data description

The data used in this paper are drawn from three successive rounds of the Vietnam Household Living Standards Surveys (VHLSS 2002, 2004 and 2006). These surveys are LSMS surveys' type, probably one of the most popular household surveys in developing countries. In addition, the VHLSS has the reputation of being one of the best LSMS surveys in the world. Initially designed by the World Bank to measure and monitor poverty and inequality, LSMS became multi-purpose studies, covering almost all aspects of the economic and domestic activities of households.

In terms of sample design, the VHLSSs are a classical three-stage stratified random survey, covering the ordinary households at the national level[2]. The sample size is quite large even if it has been progressively reduced, from 75,000 in 2002 to 45,000 in 2004 and 2006 (see Table 2). A detailed questionnaire (including expenditures and other subject specific modules) has been applied to a random subsample of 30,000 and around 9,000 households respectively. To track individual changes over time, a panel component has been

[2] The primary sample units are the communes/wards, the secondary sample units are the census enumeration areas or villages and the tertiary sample units correspond to households. For more details, see Phung and Nguyen (2006).

implemented, selected among the three subsamples. As in other studies, individuals have been matched between the three surveys using the common individual identifier across years, cross-checked with gender, age and other individual information. After undertaking thorough data cleaning including checking consistency of time-invariant variables between the three survey rounds, we have been able to recover a substantial number of new individuals, and to correct misclassified ones. In the end, we obtained a more exhaustive panel than previous works on the same data .

Our balanced panel includes 7,408 individuals matched between all the three rounds of VHLSS (see Table 2); 10,891 individuals observed only in 2002 and 2004; and 9,529 individuals observed only in 2004 and 2006. As the major objective of our study is to investigate the question of earnings of workers participating in formal/informal employment in private or household enterprises, we retained only those individuals who are 15 years old or more, engaged in non-agricultural and non-public activities. Finally, our empirical analysis is based on a panel of non-farm workers including 952 individuals observed in all three years (balanced part). In the unbalanced parts, there remain 1,564 individuals observed in both 2002 and 2004 but not in 2006, and 1,897 individuals who are observed as non-farm workers in both 2004 and 2006, but were not surveyed in 2002.

Table 2. Building the panel of individuals with VHLSS 2002, 2004 and 2006

	2002	**2004**	**2006**
Full sample (household)	75,000	45,000	45,000
Detailed sample (household)	30,000	9,000	9,000
All individuals			
- Unbalanced Panel	18,299	27,828	16,937
- Balanced panel	7,408	7,408	7,408
Population aged 10 years or over*			
- Unbalanced Panel	13,732	23,326	15,336
- Balanced panel	5,742	5,742	5,742
Non-farm workers aged 15 years or over			
- Unbalanced Panel	**2,516**	**4,413**	**2,849**
- Balanced Panel	**952**	**952**	**952**
- Observed in 2002 and 2004	**1,564**	**1,564**	**-**
- Observed in 2004 and 2006	**-**	**1,897**	**1,897**

Source: VHLSS, 2002, 2004 & 2006, GSO; authors' calculations.
Note: * Those whose information on employment was asked for in 2004 and 2006. In 2002, this section of questions was applied for the population aged 6 years and over.

The VHLSS does not allow us to capture the concept of informal sector following strictly the international definition (ILO, 2003; SNA, 2008), as the survey has not been designed for such a purpose. In Vietnam, the *informal sector* is defined as all private unincorporated enterprises that produce at least some of their goods and services for sale or barter, are not registered (have no business licence) and are engaged in non-agricultural activities. The *informal employment* corresponds to employment with no social security insurance. On the job side in the VHLSS, the formal/informal divide can only be computed for wage workers. On the firm side, household businesses can be split between registered and not registered ones, but no information is available on the jobs generated by these businesses. Therefore, we created an informality proxy, perfectly consistent with the ILO definition of informal employment, which combines job and firm approaches. Four main groups are distinguished. Among wage workers, informal ones are those who do not benefit from social security insurance. Among employers and self-employed, informal workers are those whose business is not registered. As in other studies, we exclude agriculture from the analysis. This classification provides the best available measures of informality in Vietnam, previous to the LFS2007 (which unfortunately does not provide any panel component; Cling *et al.*, 2010).

Information on informality can be tracked in the questionnaire by the "*Employment*" and "*Non-Farm Household Business*" (*NFHB*) modules. Apart from our formal/informal variable, we compute the labour income associated with each remunerated job. For wage workers, earnings are obtained by summing the direct wage with all the supplementary benefits perceived in cash or in kind and converted into pecuniary equivalent (public holidays, bonuses, social allowance, etc.). For the self-employed, we compute their annual net income by subtracting all the expenses engaged (intermediary consumption, labour costs, taxes, etc.) to the production generated by the household business. Hourly earnings used in the econometric analysis are deduced using the total number of hours worked per year. Additionally, all the classical individual and household based socio-demographic variables are appended to our database.

Finally, regional and time deflators have been elaborated to compute real earnings. As the regional deflators (16 locations, i.e. 8 regions in two areas, urban and rural) included in the VHLSS databases have been criticized for not being consistent over time (McCaig *et al.*, 2009), we combined the VHLSS 2006 regional deflators (supposed to be the most reliable) with the provincial CPIs (63 provinces) provided by the General Statistics Office aggregated at the regional level. This adjustment is quite substantial given the high differences in price levels and inflation: a difference of more than 77% in prices is observed between the lowest price level (rural North-East region, 2002) and highest one (urban South-East region, 2006), showing that markets are far from being fully integrated in Vietnam.

3. Econometric Approach to Measuring Informal-Formal Earnings Gaps

The empirical analysis consists of assessing the magnitude of different types of informal-formal earnings gaps using OLS and quantile regressions with log hourly earnings as dependent variable. Standard earnings equations are thus estimated at the mean and at various conditional quantiles of the earnings distribution. The models are regressed on a pooled sample of workers over years employed formally and informally. The different covariates introduced into the regressions are the completed years of education, the years of potential experience (with quadratic profiles for these two regressors), a dummy for being married, a dummy for being a woman, eight dummy variables of branch activities[3] to account for technological differences between activities, seven regional dummies and two time dummies to control for macroeconomic trend effects on earnings.

A number of studies based on data on African manufacturing firms have shown that wages are positively correlated to firm size, conditional on standard human capital variables.[4] The literature discusses numerous reasons why wages are positively correlated with firm size. One of the frequently made arguments is that firm size is correlated with omitted worker quality because large firms usually attract more productive workers. In this paper, due to lack of information on the demand side characteristics, we cannot control for the size of the wage workers' firms but we control for both observed human capital and time-invariant unobserved characteristics, thus mitigating the drawback of not accounting for firm size in the regressions.

To account for informal-formal differences in earnings at the mean earnings level, we rely on pooled OLS regressions across years and Fixed Effects OLS regressions (FEOLS), the latter accounting for time-invariant unobserved heterogeneity. The FE model can be written as

$$y_{it} = x'_{it}\beta + \gamma I_{it} + \alpha_i + \varepsilon_{it} \qquad (1)$$

where x_{it} denotes the vector of characteristics of individual *i* observed at time *t* (which includes a constant term), I_{it} represents a dummy taking value one if person *i* observed at time *t* is an informal worker. $\propto_i$ is the time-invariant individual heterogeneity (or the individual fixed effect) and ε_{it} is an i.i.d. normally distributed stochastic term absorbing measurement error. Note that $E[\varepsilon_{it}|x_{it}, I_{it}, \alpha_i] = 0$. One could use a random effect (RE) model assuming in addition that $E[\alpha_i|x_{it}, I_{it}] = 0$. However, as in many other cases, this condition is very unlikely to be satisfied as individual unobserved characteristics are generally correlated with workers' observable characteristics. Hausman's specification test

[3] These dummies include "Food and beverage", "Textile, leather, wood, handicraft", "Construction", "Whole sale", "Retail sale", "Hotel and restaurant", "Transportation and wharehouse" and "Other manufacture" (the reference being "Public sector services").

[4] See Strobl and Thornton (2002), Manda (2002) and Söderbom, Teal and Wambugu (2005).

indeed confirmed a systematic difference in the FE and RE estimators, meaning that the FE estimator is consistent, but that the RE estimator is not.

The estimated coefficient $\hat{\gamma}$ is interpreted as a measure of the conditional earnings premium/penalty experienced by workers in informal employment compared to workers in formal employment. However, as mentioned previously, informal employment is extremely heterogeneous and a finer job divide should be considered. We then define four categories of workers split by job status (wage workers vs. self-employed workers) and institutional sector (formal vs. informal) and create four dummies taking value one if the individual *i* at time *t* is an informal wage worker (IW_{it}), a formal wage worker (FW_{it}), an informal self-employed worker (IS_{it}) and a formal self-employed worker (FS_{it}). Taking the formal wage workers as the reference category, the model we estimate can be written as

$$y_{it} = x'_{it}\beta + \delta IW_{it} + \theta IS_{it} + \lambda FS_{it} + \alpha_i + \varepsilon_{it} \quad (2)$$

The estimated coefficients $\widehat{\delta}$, $\hat{\theta}$ and $\hat{\lambda}$ are interpreted, respectively, as the *IW – FW*, *IS – FW* and *FS – FW* conditional earnings gaps. Identification of these conditional earnings gaps relies on the presence in the sample of *movers* between employment states over time. Those movers can be compared to the *stayers* in terms of earnings. As an illustration, we consider a simple two-period example and eight cases of transitions out of the various possibilities of professional trajectories (which are 16 in a two-period example):

2 cases of stayers:

$$E[y_{i2} - y_{i1} | IW_{i1} = 1, IW_{i2} = 1] = \Delta \quad (3)$$

$$E[y_{i2} - y_{i1} | IS_{i1} = 1, IS_{i2} = 1] = \Delta \quad (4)$$

with $\Delta = (x'_{i2} - x'_{i1})\beta$

6 cases of movers:

$$E[y_{i2} - y_{i1} | IW_{i1} = 1, IS_{i2} = 1] = \Delta + \theta - \delta \quad (5)$$

$$E[y_{i2} - y_{i1} | IW_{i1} = 1, FW_{i2} = 1] = \Delta - \delta \quad (6)$$

$$E[y_{i2} - y_{i1} | FW_{i1} = 1, IS_{i2} = 1] = \Delta + \theta \quad (7)$$

$$E[y_{i2} - y_{i1} | FW_{i1} = 1, FS_{i2} = 1] = \Delta + \lambda \quad (8)$$

$$E[y_{i2} - y_{i1} | IS_{i1} = 1, FS_{i2} = 1] = \Delta + \lambda - \theta \quad (9)$$

$$E[y_{i2} - y_{i1} | IS_{i1} = 1, FW_{i2} = 1] = \Delta - \theta \quad (10)$$

with $\Delta = (x'_{i2} - x'_{i1})\beta$

Equations (3) and (4) give examples of the changes in earnings for *stayers*, i.e. for workers that do not change their employment state between the two periods. Equations (5) and (6) illustrate the changes in earnings for those workers coming from an informal wage job and

moving, respectively, into an informal self-employed job and a formal wage job; equations (7) and (8) represent these earnings differentials for those coming from a formal wage employment and moving, respectively, into an informal self-employed job and a formal self-employed job. Finally, the cases of informal self-employed workers moving to, respectively, formal self-employed and formal wage jobs are considered in equations (9) and (10).

The identification strategy of FE on movers is quite standard but, in practice, one should verify that the number of moves across employment states is sufficient for a valid use of this estimator. We verify that this is the case in Tables 4, 5 and 6 in the next section.

Finally, to allow the earnings gaps between job statuses to differ along the earnings distribution, we rely on Quantile Regressions (QR). Quantile earnings regressions consider specific parts of the conditional distribution of the hourly earnings and indicate the influence of the different explanatory variables on conditional earnings respectively at the bottom, at the median and at the top of the distribution.

Using our previous notation, the model that we seek to estimate is:

$$q_{\varrho}(y_{it}) = x'_{it}\beta(\varrho) + \delta(\varrho)IW_{it} + \theta(\varrho)IS_{it} + \lambda(\varrho)FS_{it} + \alpha_i, \forall \varrho \in [0,1] \qquad (11)$$

where $q_{\varrho}(y_{it})$ is the ϱ^{th} conditional quantile of the log hourly earnings. The set of coefficients $\beta(\varrho)$ provide the estimated rates of return to the different covariates at the ϱ^{th} quantile of the log earnings distribution and the coefficients $\delta(\varrho), \theta(\varrho)$ and $\lambda(\varrho)$ measure the parts of the earnings differentials that are due to informal-formal job differences at the various quantiles. In a quantile regression, the distribution of the error term is left unspecified. The quantile regression method provides robust estimates, particularly for misspecification errors related to non-normality and heteroskedasticity.

When then turn to Fixed Effects Quantile Regressions (FEQR). The extension of the standard QR model to longitudinal data has been originally developed by Koenker (2004). More recently, Canay (2010) proposed an alternative and simpler approach which assumes that the unobserved heterogeneity terms have a pure location shift effect on the conditional quantiles of the dependent variable. In other words, they are assumed to affect all quantiles in the same way. It follows that these unobserved terms can be estimated in a first step by traditional mean estimations (for instance by FE OLS). Then, the predicted $\widehat{\alpha_i}$ are used to correct earnings, such as $\widehat{y_i} = y_i - \widehat{\alpha_i}$, which are regressed on the other regressors by traditional QR.

When running the regressions (2) and (11), we always provide robust standard errors using bootstrap replications. To reduce a possible bias due to measurement and reporting errors in the earnings and independent variables, we trim the data and drop influential outliers and observations with high leverage points from our sample that we identify by the DFITS-statistic. As suggested by Belsley, Kuh and Welsch (1980), we use a cutoff-value $|DFITS|_{ihj} > 2\sqrt{k/N}$ with k, the degrees of freedom (plus 1) and N the number of

observations. This procedure removes 497 observations from our initial unbalanced panel sample.

4. Descriptive statistics and validity checks

Table 3 presents some basic summary statistics of the main characteristics of the panel data used in our analysis. These descriptive statistics are reported for the sub-samples of wage/self-employed workers, broken down by formal and informal jobs.

The results obtained for average earnings are in line with common findings in the literature. Workers holding formal jobs earn more on average than those engaged in informal jobs. Among each group of formal and informal workers, self-employed workers are those with higher earnings in comparison with wage earners. Informal workers tend to be younger than their formal worker counterparts, especially for wage workers. Self-employed workers exhibit on average longer potential experience in the labour market (which is calculated as age minus years of reported schooling minus five). As expected, workers having higher level of education are less likely to be engaged in informal employment and vice versa.

At the aggregate level, the gender ratio does not vary between formal and informal jobs. However, female workers have more opportunity to get formal wage jobs than informal ones. Finally, formal and informal workers are differently allocated across branches of activity. Specifically, informal employment is found more in trade, restaurants and transportation, while formal jobs are more concentrated in services. Interestingly, the share of manufacture is much higher for informal jobs than for formal ones (31% vs. 18%). Within employment sectors, the distribution is also fairly unbalanced: formal wage workers are stubbornly engaged in services (60%), whereas formal self-employed workers hold transportation and hotel & restaurant jobs (12% and 52% respectively). Informal wage workers engaged prominently in construction (13%) and trade (35%) while informal self-employed job's structure looks like the formal self-employed one. These significant differences in the distribution of job structure underline the importance of controlling for sectors of activity in our earnings estimations.

Table 3. Summary Statistics (pooled waves 2002-2004-2006)

	Formal workers						Informal workers					
	All workers		Self-Employed		Wage workers		All workers		Self-employed		Wage workers	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Hourly earnings	1.949	0.63	2.134	0.70	1.885	0.60	1.552	0.60	1.645	0.67	1.450	0.50
Potential experience	21.98	10.65	26.12	10.66	20.52	10.26	24.22	13.08	28.36	13.08	19.66	11.48
Age	38.79	10.13	40.47	9.93	38.20	10.14	37.05	12.22	40.88	11.98	32.83	11.03
Female	0.462	0.50	0.536	0.50	0.436	0.50	0.438	0.50	0.603	0.49	0.256	0.44
Married	0.787	0.41	0.824	0.38	0.775	0.42	0.703	0.46	0.793	0.41	0.604	0.49
Position in the family												
Head of household	0.399	0.49	0.390	0.49	0.402	0.49	0.376	0.48	0.382	0.49	0.369	0.48
Spouse	0.299	0.46	0.375	0.48	0.273	0.45	0.257	0.44	0.386	0.49	0.115	0.32
Children	0.273	0.45	0.199	0.40	0.299	0.46	0.337	0.47	0.209	0.41	0.479	0.50
Others	0.029	0.17	0.036	0.19	0.026	0.16	0.030	0.17	0.023	0.15	0.036	0.19
Education												
No degree	0.020	0.14	0.033	0.18	0.015	0.12	0.091	0.29	0.105	0.31	0.075	0.26
Primary	0.112	0.32	0.236	0.43	0.069	0.25	0.324	0.47	0.330	0.47	0.318	0.47
Secondary	0.489	0.50	0.613	0.49	0.445	0.50	0.455	0.50	0.432	0.50	0.481	0.50
University & others	0.379	0.49	0.117	0.32	0.471	0.50	0.129	0.34	0.133	0.34	0.126	0.33
Industry												
Food and beverage	0.037	0.19	0.038	0.19	0.037	0.19	0.060	0.24	0.068	0.25	0.051	0.22
Textile, leather, wood, handicraft	0.075	0.26	0.068	0.25	0.077	0.27	0.154	0.36	0.147	0.35	0.162	0.37
Construction	0.119	0.32	0.062	0.24	0.139	0.35	0.083	0.28	0.040	0.20	0.131	0.34
Whole sale	0.031	0.17	0.004	0.06	0.041	0.20	0.180	0.38	0.013	0.11	0.364	0.48
Retail sale	0.025	0.16	0.049	0.22	0.016	0.13	0.017	0.13	0.025	0.16	0.009	0.09
Hotel and restaurant	0.149	0.36	0.513	0.50	0.022	0.15	0.264	0.44	0.433	0.50	0.078	0.27
Transportation & wharehouse	0.040	0.20	0.134	0.34	0.006	0.08	0.086	0.28	0.135	0.34	0.033	0.18
Other manufacture	0.059	0.24	0.067	0.25	0.057	0.23	0.093	0.29	0.093	0.29	0.092	0.29
Other services	0.465	0.50	0.066	0.25	0.605	0.49	0.063	0.24	0.047	0.21	0.081	0.27
Number of observations	4,036		1,049		2,987		5038		2,639		2,399	

Source: VHLSS, 2002, 2004 & 2006, GSO; authors' calculations.

Tables 4, 5 and 6 report the transition matrices of employment status between 2002-2004, 2004-2006 and 2002-2006 obtained from our unbalanced panel dataset. In order to provide a more general picture of the dynamics of switching between employment status, we present the results obtained from the panel of all individuals aged 15 or more. The categories shown in the matrices include then not only the four non-farm employment statuses but also "agriculture" and "not-working" (the latter category including, to simplify the notation, those who are inactive or unemployed). This presentation allows identification of both transition flows within the non-farm sector employment and those into or out of the non-farm sector. The figures in the first two rows and columns of each matrix reveal that the latter are not negligible. Among these, we observe that the most important flows are those between informal non-farm and agricultural jobs. These patterns of mobility would partly

reflect the low entry barriers to both sectors as well as the fact that the majority of the workforce in Vietnam is still predominantly employed in agriculture. Another striking evidence on the flows of transition from non-farm employment is the rather high probability of becoming inactive or unemployed for those who were previously self-employed.

Table 4. Transition matrix of employment status between 2002 and 2004 (%)

	2004						
2002	Not-working	Agri-cultural emp.	Formal Wage	Informal Wage	Formal Self-employed	Informal Self-employed	Total
Not-working	62.77	19.64	3.45	5.74	2.33	6.06	100 (21.7)
Agricultural emp.	7.4	80.39	1.59	5.58	0.68	4.36	100 (50.2)
Formal Wage worker	3.51	6.15	74.34	13.76	0.88	1.37	100 (8.9)
Informal Wage worker	5.01	17.05	3.65	62.25	3.11	8.93	100 (6.5)
Formal Self-employed worker	7.1	5.03	1.78	5.33	55.92	24.85	100 (2.9)
Informal Self-employed worker	6.7	16.3	1.45	8.06	12.23	55.25	100 (9.8)
Total	18.88	47.98	8.64	10.25	3.96	10.28	100 (100)

Source: VHLSS, 2002 & 2004, GSO; authors' calculations.

Table 5. Transition matrix of employment status between 2004 and 2006 (%)

	2006						
2004	Not-working	Agri-cultural emp.	Formal Wage	Informal Wage	Formal Self-employed	Informal Self-employed	Total
Not-working	81.34	10.36	1.96	3.5	0.92	1.92	100 (33.4)
Agricultural emp.	10.33	78.24	1.54	4.73	0.89	4.26	100 (39.7)
Formal Wage worker	3.72	5.37	81.51	6.61	0.62	2.17	100 (6.7)
Informal Wage worker	5.5	15.26	8.7	60.16	2.57	7.81	100 (7.9)
Formal Self-employed worker	12.13	6.07	1.57	3.72	49.12	27.4	100 (3.6)
Informal Self-employed worker	7.7	14.68	1.84	6.58	9.3	59.9	100 (8.7)
Total	33.07	37.61	7.66	8.92	3.46	9.27	100 (100)

Source: VHLSS, 2004 & 2006, GSO; authors' calculations.

Table 6. Transition matrix of employment status between 2002 and 2006 (%)

	2006						
2002	Not-working	Agri-cultural emp.	Formal Wage	Informal Wage	Formal Self-employed	Informal Self-employed	Total
Not-working	55.29	17.65	6.87	9.62	2.64	7.93	100 (19.9)
Agricultural emp.	7.32	76.44	2.76	6.44	1.12	5.92	100 (52.5)
Formal Wage worker	4.29	5.81	74.49	11.87	0.76	2.78	100 (8.3)
Informal Wage worker	5.35	17.06	4.35	55.18	3.68	14.38	100 (6.2)
Formal Self-employed worker	13.1	7.59	2.07	2.07	51.03	24.14	100 (3.2)
Informal Self-employed worker	10.34	20.46	2.95	7.38	9.7	49.16	100 (9.9)
Total	16.95	47.48	9.64	10.55	3.93	11.45	100 (100)

Source: VHLSS, 2002 & 2006, GSO; authors' calculations.

For the purpose of measuring informal earnings gaps, we focus hereafter on the transition flows within the non-farm jobs (figured in the shaded cells in the transition matrices). They show that, on average, not negligible flows are observed between non-farm job's categories. For the two time periods, around one quarter of workers changed position from one of our four job's status to another. Around 20% of the total sample moved from informal to formal jobs and the rates of formal-informal transitions are about 40%. However, the flows are balanced in absolute terms. The fluidity between wage and non-wage jobs is smaller, but is far from being negligible (from 13% to 15% of the total sample, depending on the years). Here again, the movements to and from wage jobs are relatively symmetrical. At a more disaggregated level, job mobility is at its highest for formal self-employed workers, where less than two thirds keep the same status in our different panels. Formal wage workers are the most stable (82% to 74% of stayers), while informal workers (wage and non-wage) are in between with a proportion of stayers ranging from 55% to 62%. Formal wage workers mainly move to informal wage jobs. When moving, informal wage workers tend to privilege informal self-employed positions, and secondarily formal wage jobs. Formal self-employed movers mainly get their business informalized (probably due to adverse conditions). A lower share of informal self-employed workers makes the inverse move, by formalizing their business. However, a substantial proportion also closes their business to become informal wage workers.

All in all, the high consistency between our transition matrices over different samples and time periods appears to be a sound indicator of data quality. We would claim that the observed changes reflect real phenomena and do not mainly capture measurement errors. Furthermore, on the methodological side, the substantial numbers of movers is key for our estimation strategy. However, it is also important that the movements between these types of jobs do not specifically concentrate on certain workers in the sample. In order to verify that, we examine the rate of transitions across employment statuses at different earnings quantile levels. Figure A0 in Appendix shows the proportion of movers out of (or into) informal employment in each earnings quantiles in the base (or current) period. As can be seen in this figure, there is a substantial proportion of movements in both directions at all earnings levels. Overall, the transitions are more frequent in the upper quintiles and this is found for both types of transition.

Another necessary validity check for our estimation of earnings gaps is to verify the existence of actual job changes resulting from declared changes in occupation and industry type. Theoretically, tenure in the current job could be another ideal criterion to assess job changes. However, available information in VHLSS 2002 does not allow this assessment. Table A0 in the Appendix reports the rates of changes in occupation and/or industry of activity accompanied by transitions across informal and formal employment. Overall, around 60% of inter-sector movements are concomitant with changes in at least one of the two employment characteristics. This reinforces our confidence in the existence of limited measurement errors related to the reported employment status at certain time.

To end this section on descriptive analysis, let us have look at the earnings dynamics by employment status. We focus on the period 2004-2006. The first panel of Table 7 shows the level of real earning in 2006 by transition status, formal wage stayers being our basis. Consistently with Table 3, formal self-employed workers get the highest pay, while informal wage workers are at the lowest end of the earnings ladder. Compared to the pooled sample, in 2006, informal self-employed workers reversed their position with formal wage workers, meaning that the earnings hierarchy between these two categories of workers is not fixed, but may vary over time. Furthermore, earnings levels are highly dependent on transitions. For instance, and as expected, whatever their job status in 2004, those who moved to informal wage jobs earn the less. Conversely, the workers who got the opportunity to open a formal business earn the most. The results are quite similar in terms of earnings growth (second panel of Table 7). Systematically, moving to informal wage jobs is associated with the lowest increase in earnings over the period, whereas being able to change to a formal self-employed job is associated with the highest earnings growth. Of course, these unconditional averages should be controlled for observed and unobserved characteristics, which is the purpose of the following sections.

Table 7. Earnings dynamics by employment status between 2004 and 2006

2004	**Real earnings levels in 2006**				
	2006				
	Formal wage worker	Informal wage worker	Formal self-employed	Informal self-employed	**Total**
Formal wage worker	100.0	58.5	106.8	83.1	75.0
Informal wage worker	62.5	49.7	72.7	55.2	54.5
Formal self-employed	99.8	67.6	157.7	132.7	114.8
Informal self-employed	86.2	61.4	123.5	94.8	85.3
Total	82.9	59.2	121.7	88.0	80.1
2004	**Real hourly earnings growth 2004-2006**				
	2006				
Formal wage worker	100.0	90.0	100.2	95.7	94.5
Informal wage worker	92.4	86.1	94.9	87.5	87.9
Formal self-employed	99.7	92.9	104.5	102.4	100.9
Informal self-employed	97.5	90.8	101.6	97.7	96.4
Total	96.9	90.0	102.1	95.5	95.0

Source: VHLSS 2002, 2004 & 2006, GSO; authors' calculations.
Note: base 100= Income level and income growth compared to formal wage workers' stayers between 2004 and 2006.

5. Earnings gaps analysis

In this section we discuss the earning gaps between formal and informal jobs at the aggregate level, estimated using the four estimations procedures presented in Section 3. As discussed earlier, the informal sector, and more broadly the informal employment, is

immensely heterogeneous. The theoretical literature, as our own empirical evidence, suggests that a key divide should be considered within the informal jobs, between wage workers and self-employed. If the point is now well established in the literature, formal job heterogeneity is rarely acknowledged. So we distinguish between four groups of workers, split by job status (wage workers vs. self-employed) and institutional sector (formal vs. informal). In the following discussion, we compare the three other work status with formal wage workers, as our benchmark. We also investigate the gender issue.

Formal vs. informal workers

At the aggregate level, the OLS estimate of the informal employment earnings gap is a rather huge -25% (Figure 1A and Table A1). Taking into account the (time invariant) unobservable individual characteristics (UICs) through fixed effect OLS estimation (FEOLS) reduces the earnings penalty significantly, down to -15%. Thus, nearly half of the gap can be explained by unobservable characteristics, the most productive workers privileging the formal sector. As always, this standard feature does not tell us much about what specific factors are really at play. On the one hand, the innate ability or the "talent parabola" is commonly stressed in the literature. On the other hand, many other explanations can be put forward. For instance, UICs may have to do with more efficient social networks to get a formal job. However, the remaining -15% gap, once we control for UICs, highlights that formal jobs provide higher earnings *per se*. Here again, this result can be due to various factors which end up, at the firm level, in a higher productivity or market power, and/or, at the worker level, in a stronger bargaining power of formal workers to negotiate higher earnings.

To go beyond average, we ran quantile regressions (QR, Figure 1A and Tables A4 and A5). While suffering earnings penalties at all levels of the conditional distribution, informal workers suffer a smaller gap at the bottom part. From around -23% for the first two quartiles of income, the gap increases to reach -30% at the upper-tier of the distribution (quantile .90). However, the bootstrapped 95% confidence intervals are too large for the estimated QR gaps to be significantly different from the OLS estimator. The Fixed Effects Quantile Regression (FEQR) gap not only confirms the key role of UICs in reducing the "true" gap but also reveals a remarkable change in the pattern along the earnings distribution. Opposite to the estimated QR gaps, the FEQR gaps are decreasing continuously along the earnings distribution, from 19% for the bottom quantile to 10% for the upper one. If a higher number of observations could have increased the precision of our estimates, this result is mainly due to the fact that the "dualistic assumption" is too rough, gathering together very diverse categories of workers within each sector, which we investigate below in more details.

Formal vs. informal wage workers

As expected, within wage workers, those employed informally are on average worse-off than those formally hired, the global picture being similar to the one observed for all workers (Figure 1B and Table A1, column (3)). The OLS gap (-23%) is significantly reduced to -11% when individual fixed effects are introduced, suggesting that informal wage workers may have a disadvantage in terms of their unobserved productive attributes. Not taking into account the fixed effects, no clear distributional effects can be identified; which is not the case when controlling for UIC (Figure 1B and Tables A4 and A5): the gap is continuously decreasing from -16% (quantile .10) to -5% (quantile .90). Nevertheless, in both cases, formal salaried workers conserve an earnings advantage at any position in the pay ladder. Even if we cannot exclude that non pecuniary disadvantages of formal wage jobs may be compensated by earnings (such as poor working conditions)[5], these results could be taken as an acceptable validation of the *exclusion hypothesis* (for this category of workers), according to which informal wage workers are constraint in their job choice, and are probably queuing for formal jobs.

Formal wage vs. informal self-employed workers

For the bulk of the labour force, this alternative choice is probably the main trade-off, and also the most discussed in the literature. At odd with the previous case considered and more generally the dualistic approach, the conditional OLS gap is positive, with a significant premium of +6% for the informal self-employed (Figure 1C and Table A1, column (3)). Furthermore, the FEOLS models increase the premium further to +14% (column (5)). This would mean that informal self-employed workers have a disadvantage in terms of their unobserved productive characteristics (probably in terms of their entrepreneurial skills), which produces an underestimation of the premium associated with being an informal self-employed worker compared to exerting as a formal wage worker if this individual heterogeneity is not accounted for. We nevertheless should be cautious before claiming that the *exit option* may be at stake, as the self-employed earnings may be overestimated for at least two reasons: first, the measure of earnings we computed remunerates both labour and capital factors, the latter being far from negligible in the informal sector (Cling *et al.*, 2010a); second, the self-employed earnings include the share which should be attributed to the productive contribution of unpaid family workers. As we do not have any order of magnitude of these two phenomena, it is difficult to exclude the possibility that the premium we obtain may not turn into a penalty, once these two factors are taken into account.[6]

[5] For a detailed analysis of the possible existing pecuniary compensations for working conditions along the earnings distribution, see Fernández and Nordman (2009) in the case of UK.

[6] The definitive assessment is even more complex as measurement errors in incomes are usually considered as more important for self-employed than for wage workers, as the former usually do not know their precise level of income (especially informal workers who do not have book accounts), and the richest ones tend to understate their level of activity.

When turning to quantile regressions (Figure 1C and Tables A4 and A5), the distributional profile of the gap presents a clear pattern, contrary to that of the formal vs. informal wage workers. The gap steeply increases with earnings level, and is in favour of the informal self-employed workers. In absolute terms, informal self-employed labourers suffer a penalty only at the lowest end of the conditional distribution (up to about quantile .30). Afterwards, the gap is reversed into a significant premium, growing continuously up to around 35% for the richest decile, crossing the OLS estimate at the median point of the earnings distribution. FEQR confirm this trend, the only difference being that the range of variation of the gap along the distribution is attenuated. However, once the UICs are controlled for, informal self-employed workers are better-off at all points of the pay scale, from +2% at quantile .10 to +28% at quantile .90. All in all, and given the size of the premium, we can confidently conclude that informal self-employment may be more lucrative that formal wage alternatives, especially for the richest workers. As a matter of consequence, we have good presumptions to assert that, in Vietnam, a substantial part of the labour force has deliberately chosen to work in the informal sector as non-wage workers, for pecuniary reasons.

Formal wage vs. formal self-employed workers

The earnings comparison of formal wage workers and formal self-employed workers is clearly in favour of the latter, whatever the model chosen (Figure 1D and Tables A1, columns (3) and (5)). The OLS estimate presents a +40% premium, just slightly reduced with fixed effects (+32%). Compared to the informal self-employed workers, their unobserved productive attributes may be better than those of the formal wage workers. As in the case of informal self-employed workers, the premium is continuously increasing with earnings levels, but is translated upwards, a pattern in line with the empirical results obtained in the literature for developed countries. Controlling for UICs or not, formal self-employed workers are always better-off in terms of earnings than formal wage workers, the premium culminating at +70% (QR) or +47% (FEQR). Overall, it seems that the Vietnamese labour market functions under a regime of wage repression. Whatever the reasons - macro pressures of international integration or deliberate policies to control inflation, or weak bargaining power of the wage workers -, it seems globally preferable to work as an independent (even in the informal sector) than as a wage worker (at least in non-farm activities).

Formal vs. informal self-employed workers

Lastly, we turn to the comparison between the two kinds of self-employed workers: formal and informal. Formal self-employed workers are rarely considered in the literature, may be because they are too few in the countries considered. That is clearly not the case in Vietnam, as they represent 13% of our sample and more than 40% of the self-employed workers. Furthermore, there are many additional reasons to focus on this category of workers: first, to compare our results with those obtained in developed countries on salaried vs. non-salaried

workers' earnings gap, as in these countries self-employed workers are quasi-exclusively formal; second, because it allows us to establish the link with the existing formal/informal sector literature from a business perspective (not job). Finally, the comparison appears more legitimate as the nature of incomes and unobservables potentially at play are in both cases equivalent (which is not true concerning wage workers).

Formal self-employed workers are systematically in a better position than their informal counterparts, all along the pay scale (Figure 1E; the reference group is now informal self-employed workers; regressions tables are not reported to save space). Returns to firm's formalization is always positive and increasing with the net earnings, even when controlling for entrepreneurial skills and other unobserved characteristics, the most favoured in this respect choosing disproportionately the formal sector. This advantage of formal household businesses may be due to higher initial level of physical capital or more productive combination of factors (our models do not provide elements on this point), but it is compatible with the potential intrinsic benefits of getting formal (access to credit and markets) as found by Rand and Torm (2010) in the case of Vietnam.

A gender perspective

Exploring the gender dimension associated with informality is crucial for various reasons. First, there is strong imbalances in the job structure, female being more prone to hold informal jobs than their male counterparts. Second, the raw gender earnings gap is in general significantly higher in the informal sector.[7] Finally, and more importantly, the motivation to hold informal jobs is highly dependent on gender. Women may have a welfare function which is less dependent on income incentives, as they take more care of extra professional activities (as family life, children care, social relations, etc.), where informal jobs could be a more satisfying option. Without going into details, we highlight the main findings displayed in Figures 2 and Figures 3 and their corresponding regression tables reported in Tables A2, A3 and A6 to A9.

Firstly, whatever the models' specifications and the category of workers considered, females always financially suffer more (or benefit less) when they are informally employed. For instance, at the aggregate formal/informal level (Figures 2A and 3A), the OLS gap is -19% for men and -30% for women; the FEOLS being respectively -11% and -20%. Such a feature is compatible with the idea mentioned above, that women may accept lower wages in the informal sector because it provides other non-pecuniary advantages, relatively more valuable to them. However, it can also reveal barriers or labour market segmentation, which would be more pronounced for women competing for salaried jobs. Interestingly, while the

[7] For Africa, see Nordman, Robilliard and Roubaud (2011) for estimates of the gender earnings gap in the formal and informal sectors of different West African capital cities using household surveys, and Nordman and Wolff (2010) for formal sector gender earnings gaps using matched worker-firm datasets for seven African countries.

penalty for being informal wage workers remains substantial for women once UICs are controlled for (-18%, Figure 3B and column (5) of Table A3), it is no more significant for men. For the latter, working informally is at least financially as rewarding as having a formal job, whether dependent (Figure 3B) or independent (Figure 3C).

Secondly, in spite of differences in absolute levels, the distributional profile of the earnings gaps is quite similar across gender: no noticeable effect for wage workers, an increasing premium for self-employed workers, both formal and informal. The only exception is for informal wage workers, where this type of jobs seems to be relatively more attractive for women in the upper tier, while the gap increases smoothly for men.

Thirdly, the sorting process in the allocation of men and women across employment status (which is partly revealed by the effect of controlling for UICs) does not differ substantially across gender: informal wage workers have detrimental UICs (in order to get a better income) vis-à-vis formal wage workers, while the unobserved skills are favourable for self-employed workers (whether formal or informal). The only exception is for male wage workers, who have comparable UICs along the formal/informal divide.

The Vietnamese case in perspective

Comparing our results with those obtained in other developing countries allows us to highlight the Vietnam's labour market specificities. One point should be stressed however: the number of countries of comparison is rather limited, mainly restricted to Latin America; more, to our knowledge, the only paper to undertake FEQR is Bargain and Kwenda (2010), with the limitation that these authors present estimates for a subsample of full time male workers (but with the advantage of much larger sample sizes). In spite of the unique nature of the Vietnamese economy and its contextual background, our results are in line with the literature, emphasizing the dual nature of informal jobs. Furthermore, as our estimations are also conducted for women, with globally similar gap structures, these converging results may be generalized as a stylized feature.

While, on the whole, informal workers suffer penalties vis-à-vis formal workers, this feature is mainly due to informal wage earners. In fact, informal self-employed workers receive a premium vis-à-vis formal wage workers, which is increasing along the pay ladder. This feature put Vietnam closer to Mexico (and to a lesser extend Brazil) than to South Africa, where the gap, although decreasing, is always negative, even at the highest end of the earnings distribution. Vietnam, although a much poorer country, already exhibits a more integrated labour market, which is a characteristic of emerging Latin American countries compared to the dualistic Sub-Saharan African countries (see Bocquier, Nordman and Vescovo, 2010). It seems that the labour market segmentation is even less pronounced there than in the former countries, as it is the only of the four abovementioned countries where informal wage workers do not suffer penalties compared to their formal counterparts (only for males).

Finally, formal self-employed workers represent a very specific job segment, at the top of the earnings hierarchy, which should neither be aggregated with formal wage earners, nor discarded from the analysis as in many other studies.

6. Conclusion

Our paper focuses on formal/informal earnings gap in Vietnam, in order to shed light on two alternative views as regard informality: the exclusion hypothesis vs. the exit hypothesis. Taking advantage of the rich VHLSS datasets, the three rounds of panel surveys (2002, 2004 and 2006) give the unique opportunity to control for time invariant unobserved individual characteristics. Using both standard and fixed effects earnings equations estimated at the mean and at various conditional quantiles of the earnings distribution, we address the key issue of heterogeneity, at three different levels: the worker level, taking into account individual unobserved characteristics; the job level, comparing wage workers with self-employed workers; the distributional level. Gender issues are also examined. To our knowledge, this approach is applied for the first time ever in Vietnam, and more broadly in the South-East Asian region.

Our results suggest that the informal earnings gap highly depends on the workers' job status (wage employment vs. self-employment) and on their relative position in the earnings distribution. Our main conclusion is at odds with the exclusion hypothesis and what would show the observed raw earnings gaps: in many cases, informal jobs are more rewarding (self-employment) or as rewarding (male wage workers) as formal wage jobs. This feature is due to the relatively low wages of formal wage jobs. The reason for such a specificity should be investigated further (international competition pressure? wage repression policy?). Second, Vietnam's labour market seems more integrated than what its development level would have predicted. The earnings gaps look more like those observed in emerging countries, characterized by a weak segmentation between formal and informal jobs, than the standard dualistic Sub-Saharan labour markets. Third, the systematic premium at all points of the distribution of formal self-employed workers over their informal counterparts suggests that formalization of non-farm household businesses seems to be beneficial. Policies aiming at easing administrative procedures to register informal firms should be encouraged. Finally, females always financially suffer more (or benefit less) when they are informally employed. This feature opens space for specific policies to align the functioning of labour market for women with that of men (reduction in entry barriers to formal jobs, improvement of access to physical capital, etc.).

Our paper raises further promising prospects, and could be extended in various directions. A first extension would be to better control for individual unobserved characteristics, by purging our earning estimations of differences in the amount of physical capital (for self-

employed workers) and social networks. A firm based panel approach may be an interesting alternative entry in this respect. Another potential extension would be to exploit further the nature of our data (three point panel) by estimating dynamic earnings equations. Lastly, our work could be usefully complemented by investigating the determinants of job satisfaction, to enlarge the perspective which relies exclusively on earnings outputs and to check the robustness of our conclusions in this regard.

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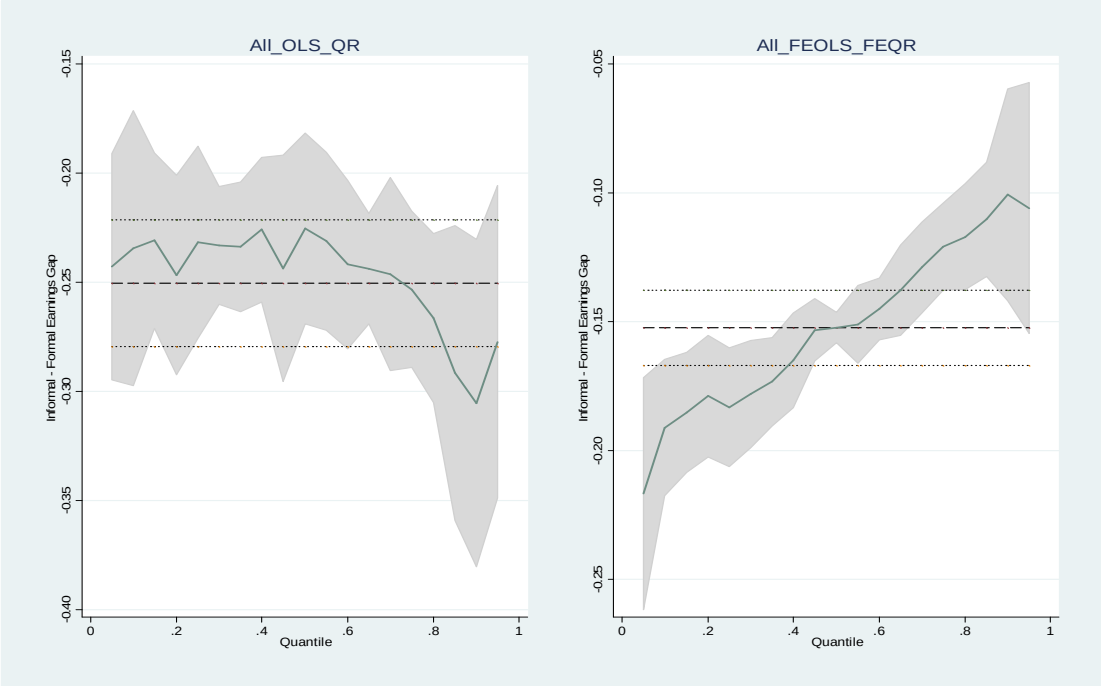
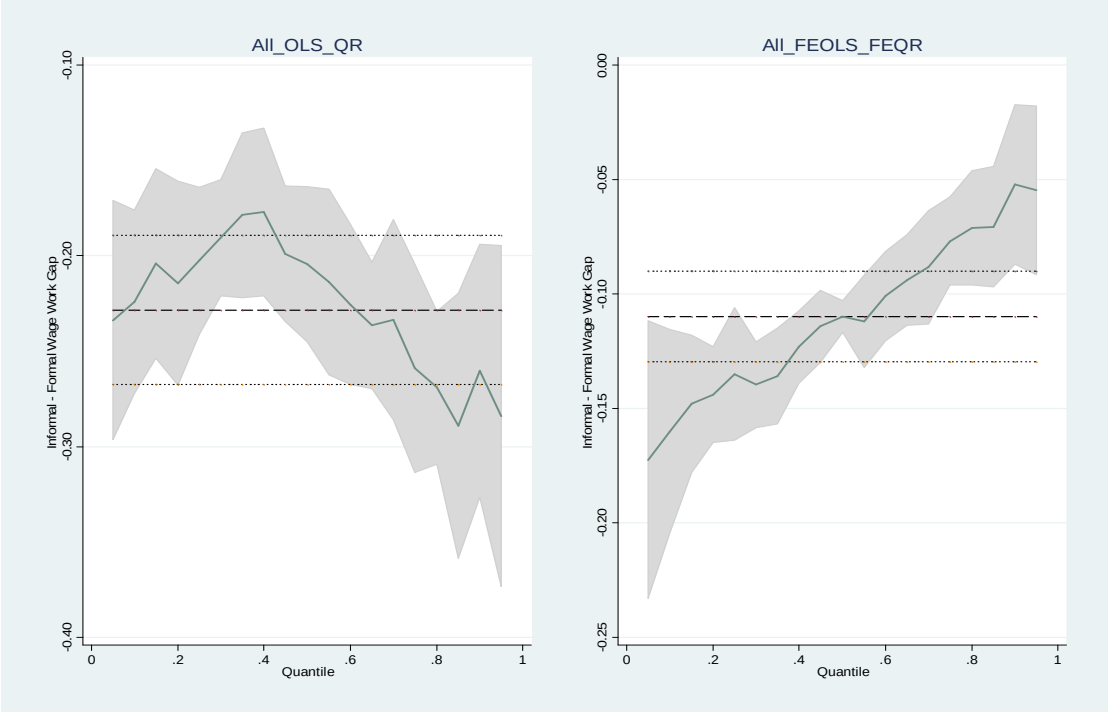
Figures 1. Estimated Earnings Gaps for Full Sample of Men and Women (with reference to formal wage workers)

Note: Fixed Effects (FE) OLS are denoted by FEOLS and Fixed Effects Quantile Regressions (QR) by FEQR. Bootstrapped 95% confidence intervals are represented by the grey surface for QR and by dashed lines for the OLS.

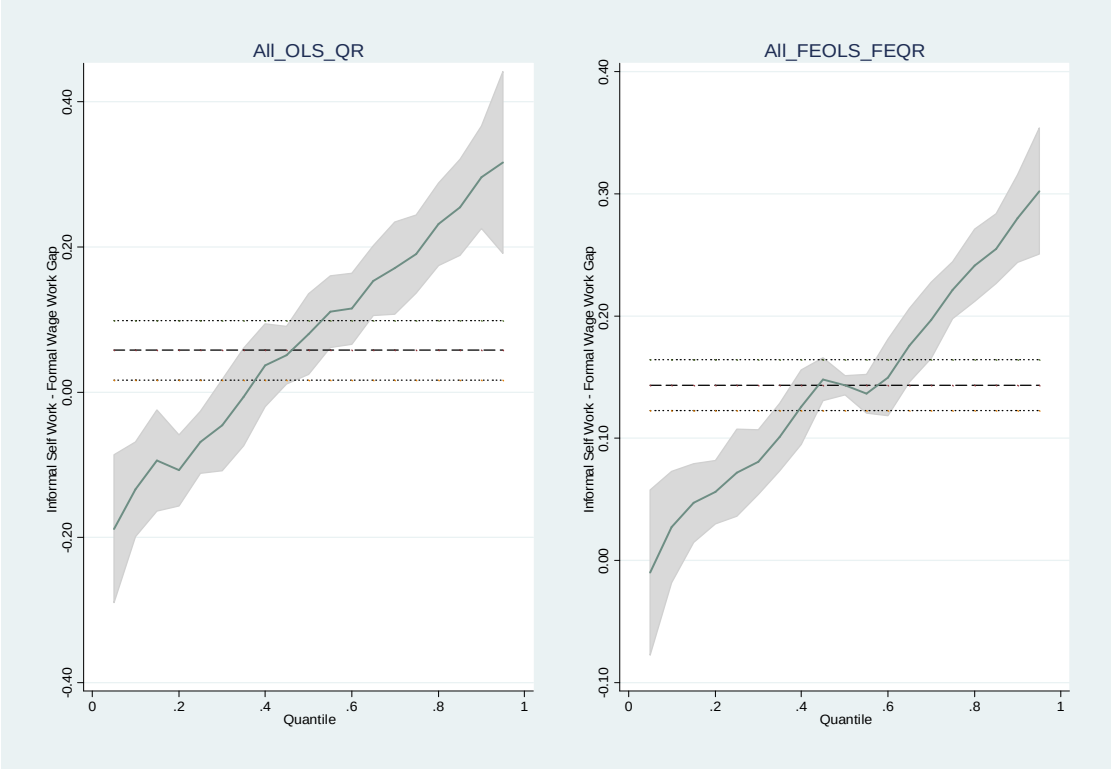
1.A Informal Worker - Formal Worker Earnings Gap



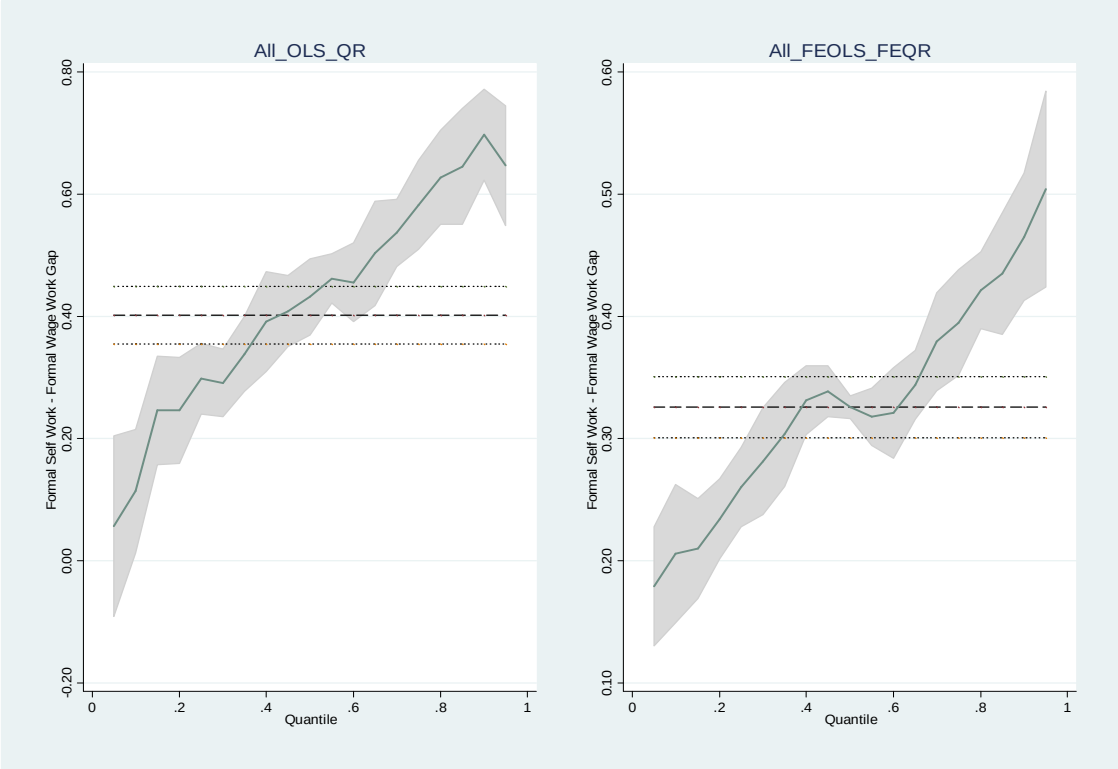
1.B Informal Wage Worker - Formal Wage Worker Earnings Gap



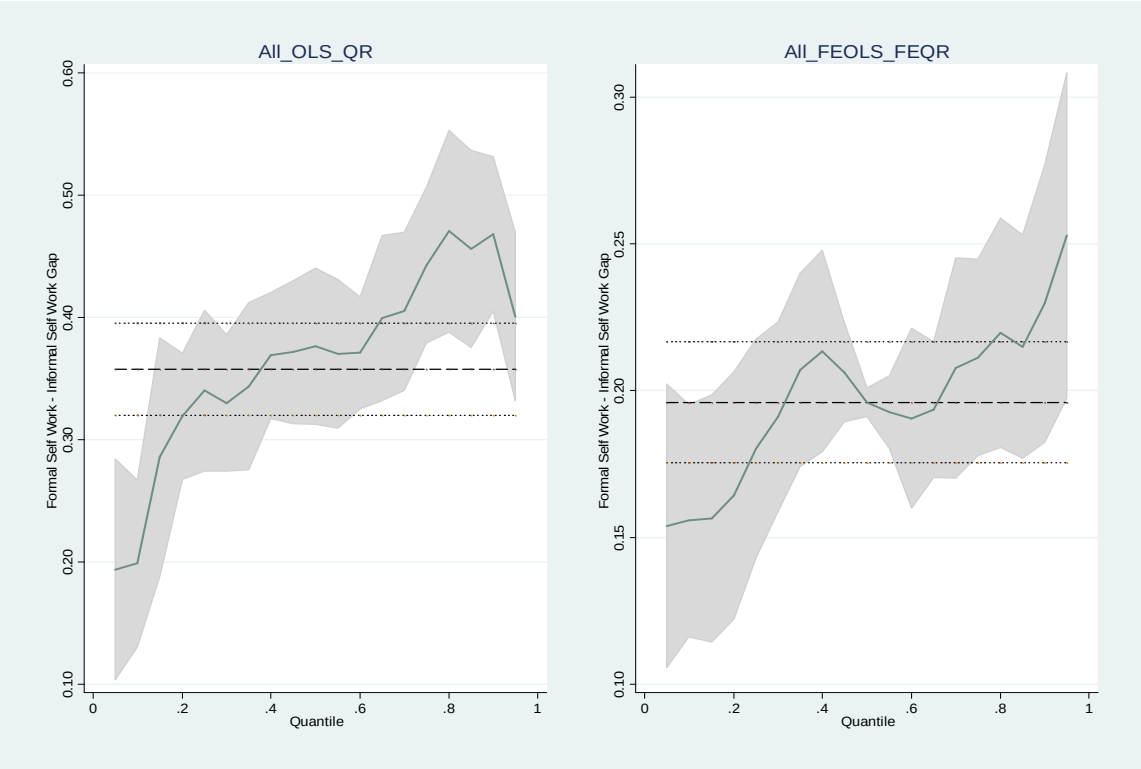
1.C Informal Self-employed Worker - Formal Wage Worker Earnings Gap



1.D Formal Self-employed Worker - Formal Wage Worker Earnings Gap



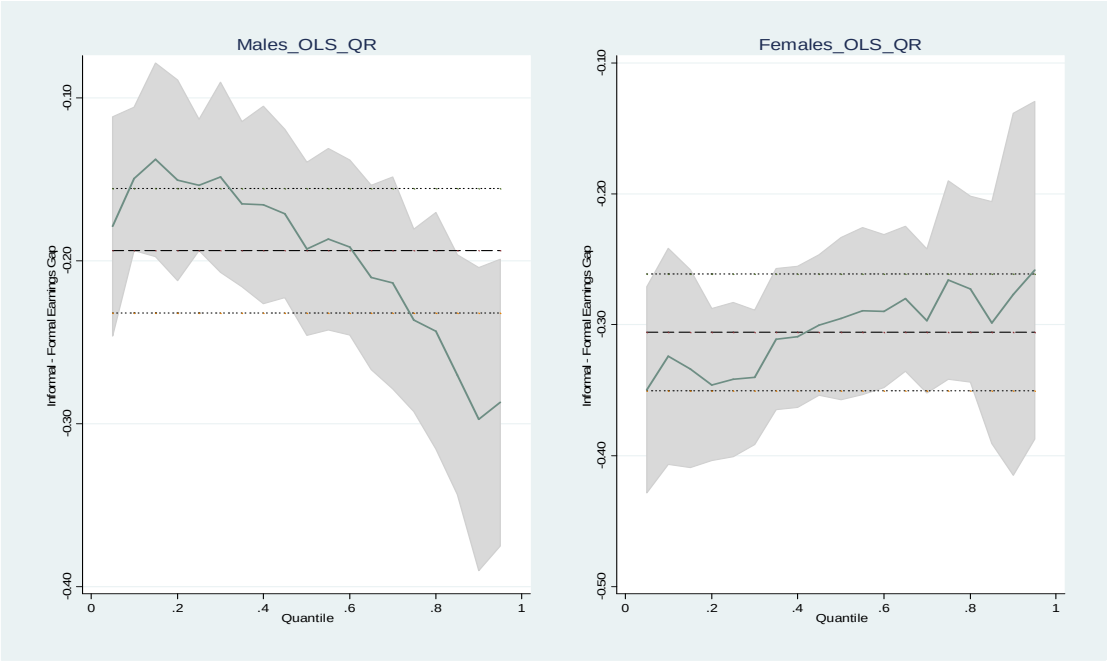
1.E Formal Self-employed Worker - Informal Self-employed Worker Earnings Gap



Figures 2. Estimated Earnings Gaps for Women and Men Separately by OLS and QR (with reference to formal wage workers)

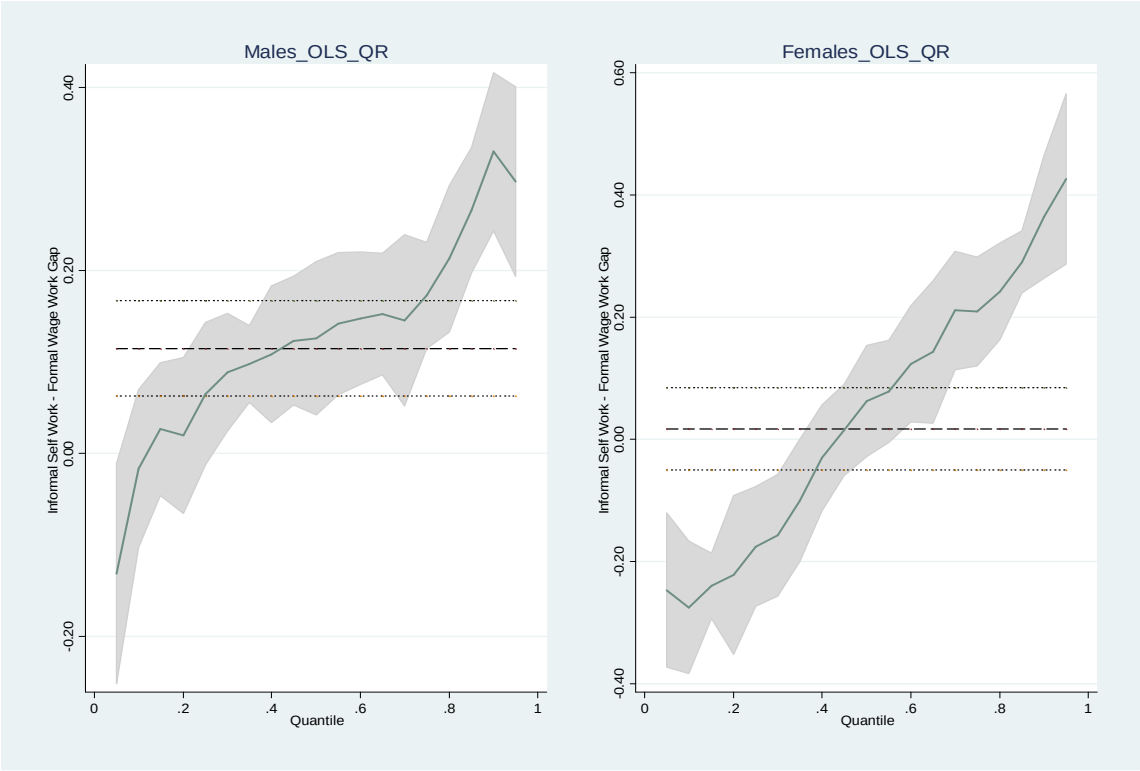
Note: Fixed Effects (FE) OLS are denoted by FEOLS and Fixed Effects Quantile Regressions (QR) by FEQR. Bootstrapped 95% confidence intervals are represented by the grey surface for QR and by dashed lines for the OLS.

2.A Informal Worker - Formal Worker Earnings Gap – OLS QR

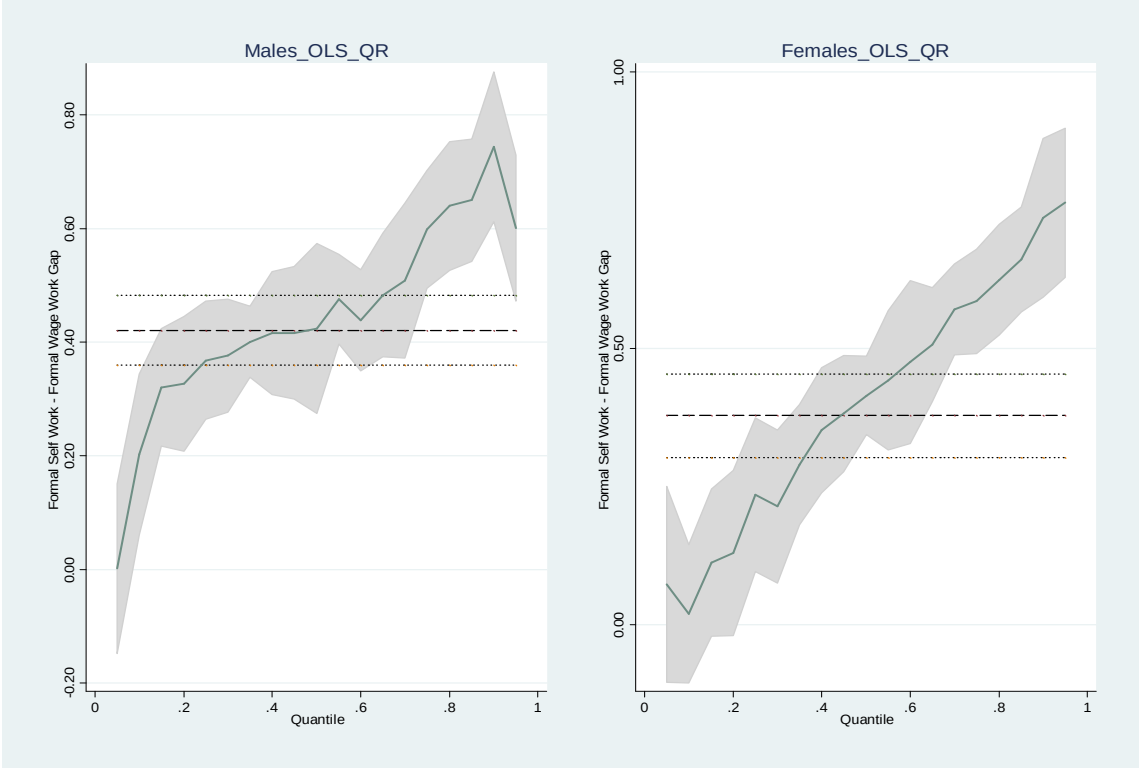


2.B Informal Wage Worker - Formal Wage Worker Earnings Gap – OLS QR

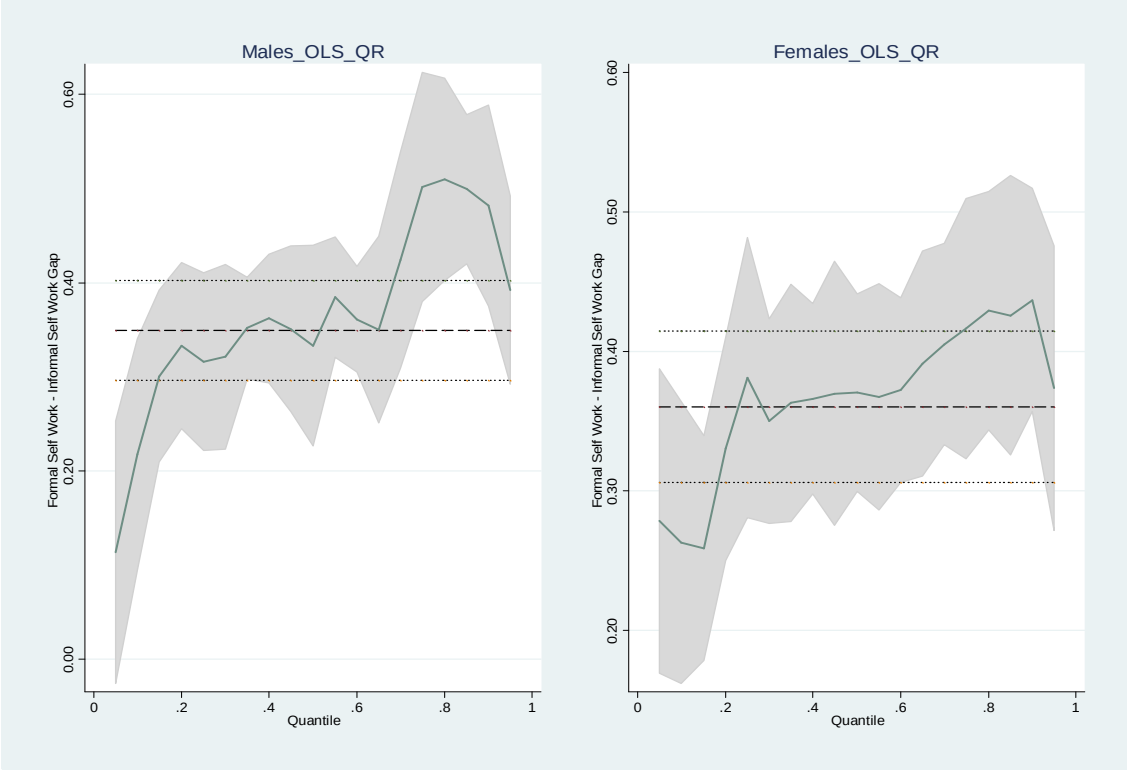
2.C Informal Self-employed Worker - Formal Wage Worker Earnings Gap – OLS QR



2.D Formal Self-employed Worker - Formal Wage Worker Earnings Gap – OLS QR

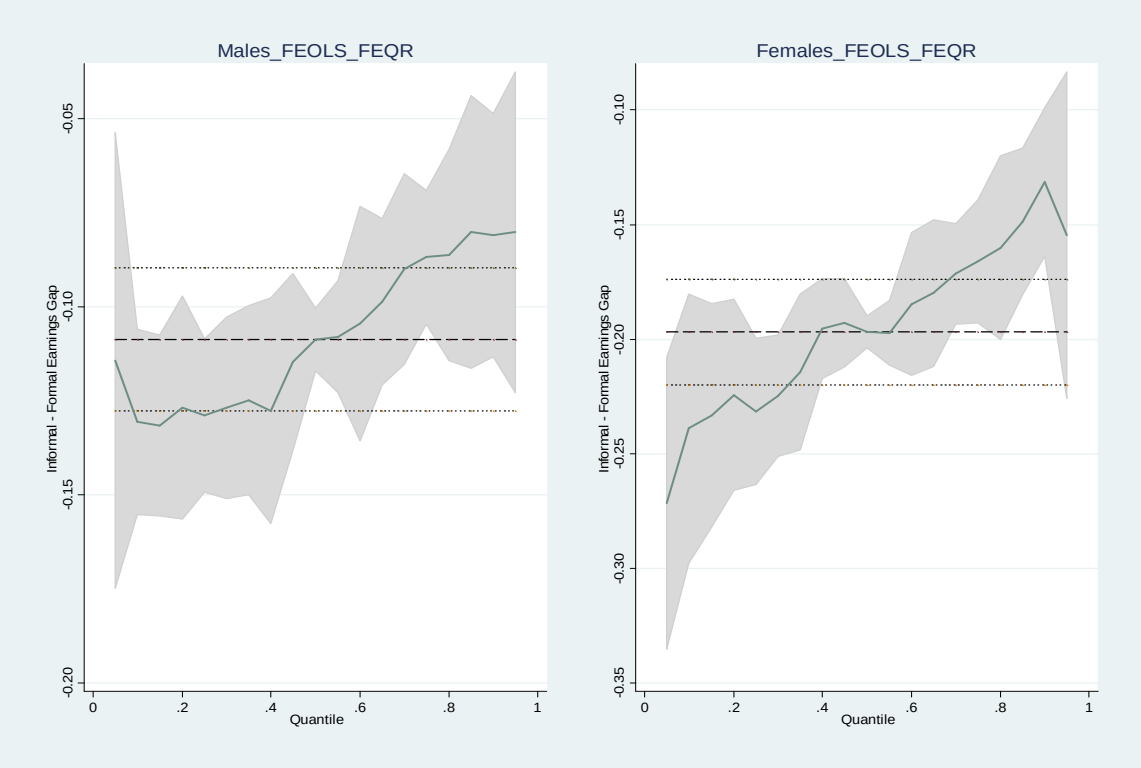


2.E Formal Self-employed Worker - Informal Self-employed Worker Earnings Gap – OLS QR

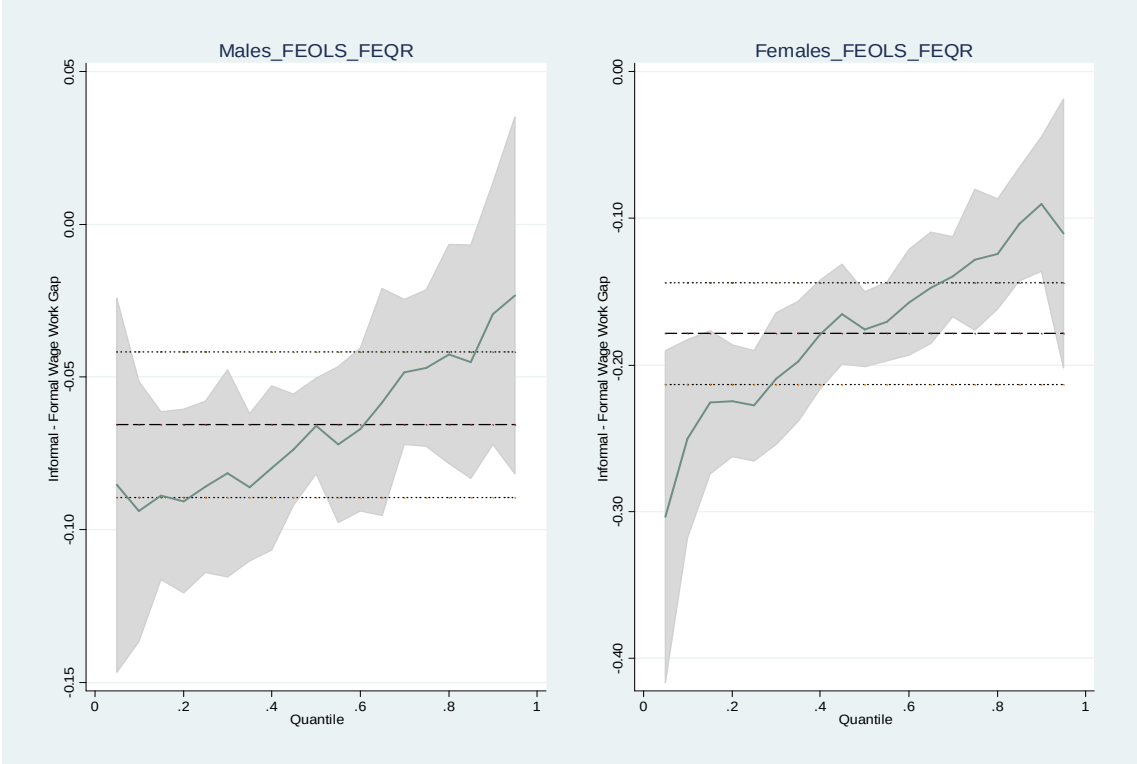


Figures 3. Estimated Earnings Gaps for Women and Men Separately by FEOLS and FEQR (with reference to formal wage workers)

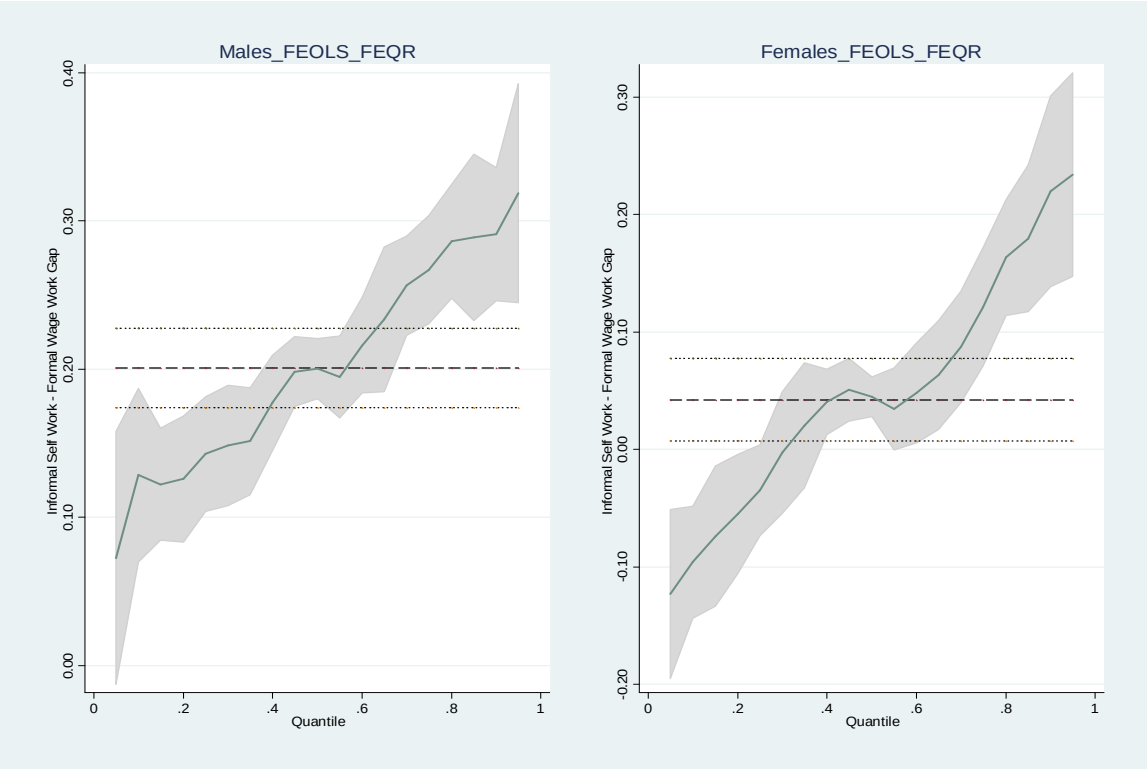
3.A Informal Worker - Formal Worker Earnings Gap – FEOLS FEQR



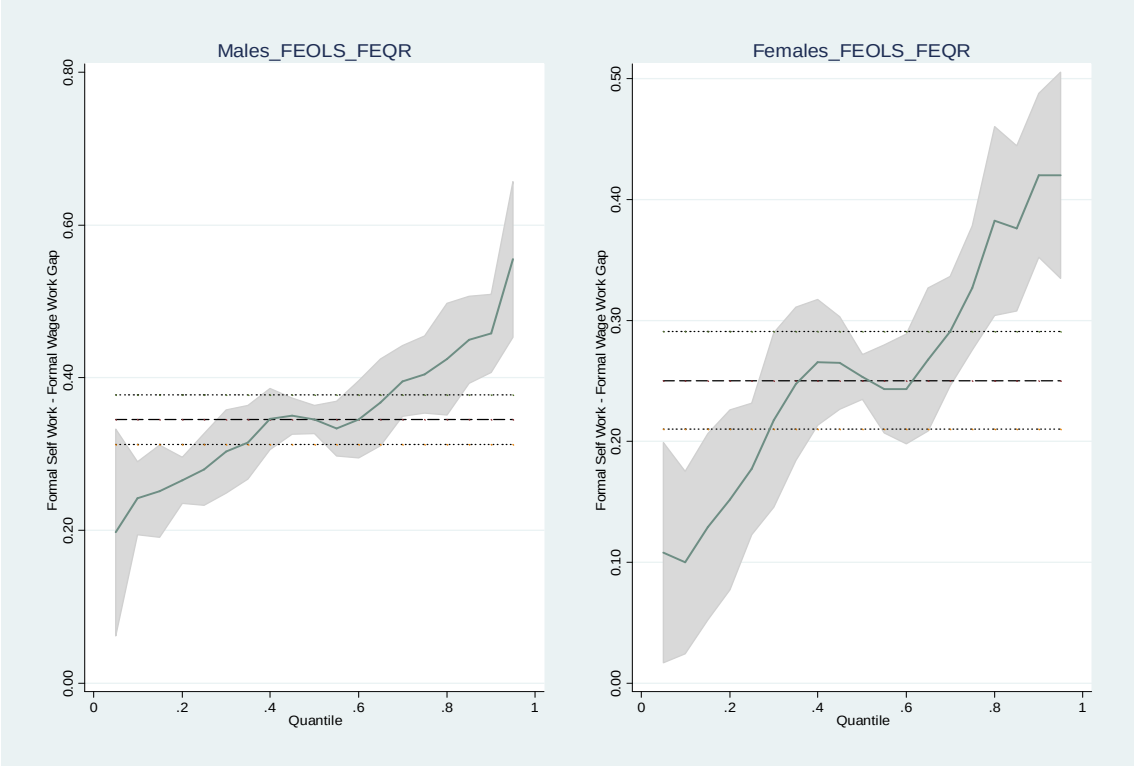
3.B Informal Wage Worker - Formal Wage Worker Earnings Gap – FEOLS FEQR



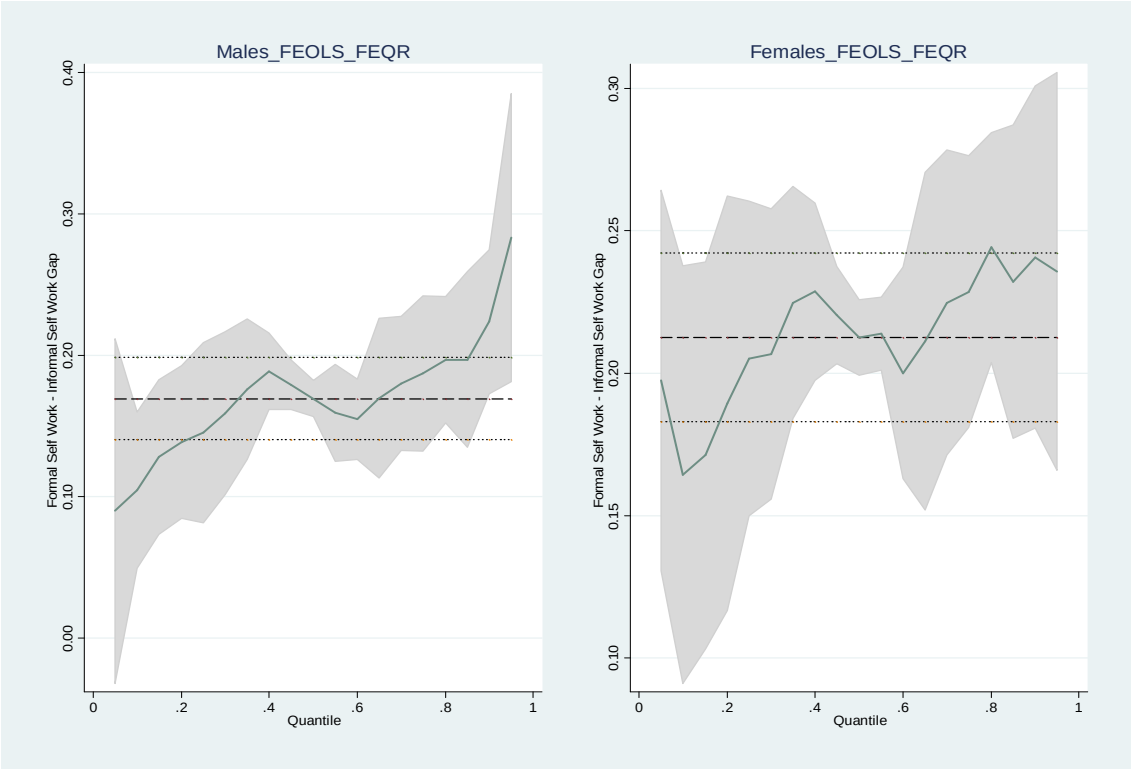
3.C Informal Self-employed Worker - Formal Wage Worker Earnings Gap – FEOLS FEQR



3.D Formal Self-employed Worker - Formal Wage Worker Earnings Gap – FEOLS FEQR

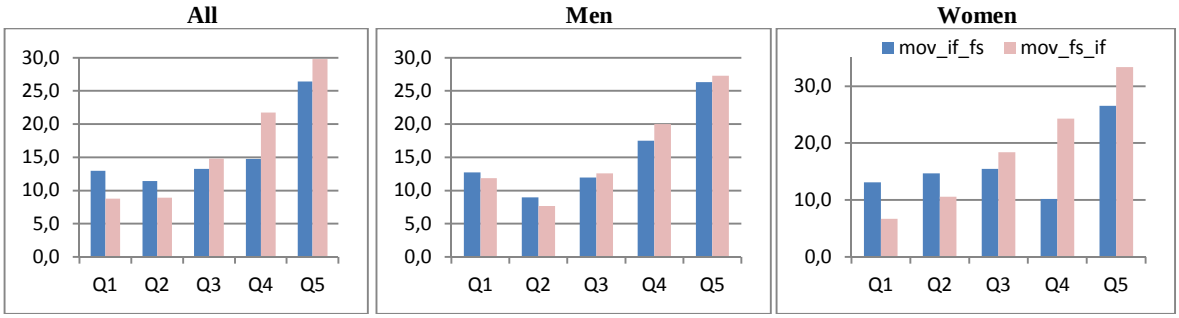


3.E Formal Self-employed Worker - Informal Self-employed Worker Earnings Gap – FEOLS FEQR



Appendix

Figure A0: Distribution of Movers in/out of the Informal Employment (%)



Source: VHLSS, 2002 & 2006, GSO; authors' calculations.
Note: Quintiles of real hourly earnings.

Table A0. Inter-sector Switches and Job Changes (%)

Job changes/Type of transition	2002 – 2004	2004 – 2006
Informal – formal		
Change in occupation	41.9	46.7
Change in industry	36.5	42.7
Change in occupation and/or industry	50.0	62.7
Formal – informal		
Change in occupation	42.4	44.4
Change in industry	40.0	41.7
Change in occupation and/or industry	69.0	59.7

Source: VHLSS, 2002 & 2006, GSO; authors' calculations.

Table A1. Mean Earnings Regressions For All Workers

Dependent Variable: Log Hourly Real Earnings
Vietnam VHLSS 2002-2004-2006

VARIABLES	(1) Pooled OLS	(2) Pooled OLS	(3) Pooled OLS	(4) Fixed Effects	(5) Fixed Effects
Informal Worker		-0.250***		-0.152***	
		(0.016)		(0.024)	
Informal Self-Emp.Worker			0.058***		0.143***
			(0.021)		(0.045)
Informal Wage Worker			-0.228***		-0.110***
			(0.018)		(0.030)
Formal Self-Emp. Worker			0.402***		0.326***
			(0.027)		(0.053)
Years of schooling	-0.015**	-0.017***	-0.033***		
	(0.006)	(0.006)	(0.006)		
Years of schooling squared	0.004***	0.004***	0.005***		
	(0.000)	(0.000)	(0.000)		
Potential experience	0.027***	0.025***	0.023***	0.027***	0.026***
	(0.002)	(0.002)	(0.002)	(0.008)	(0.008)
Potential experience squared	-0.000***	-0.000***	-0.000***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.113***	-0.120***	-0.133***		
	(0.013)	(0.013)	(0.013)		
Married	0.132***	0.127***	0.105***	0.035	0.027
	(0.016)	(0.016)	(0.016)	(0.039)	(0.038)
Year dummy 2004	0.098***	0.110***	0.111***	0.147***	0.149***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Year dummy 2006	0.201***	0.214***	0.218***	0.290***	0.293***
	(0.016)	(0.016)	(0.015)	(0.023)	(0.023)
Constant	0.881***	1.144***	1.099***	1.584***	1.493***
	(0.047)	(0.049)	(0.047)	(0.136)	(0.133)
Observations	9074	9074	9074	9074	9074
R-squared	0.252	0.274	0.307	0.093	0.109
Number of id				4306	4306

Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
The regressions also include seven regional dummies and eight branch activity dummies.

Table A2. Mean Earnings Regressions for Men
Dependent Variable: Log Hourly Real Earnings

VARIABLES	(1) Pooled OLS	(2) Pooled OLS	(3) Pooled OLS	(4) Fixed Effects	(5) Fixed Effects
Informal Worker		-0.194***		-0.109***	
		(0.021)		(0.033)	
Informal Self-Emp.Worker			0.115***		0.201***
			(0.029)		(0.055)
Informal Wage Worker			-0.163***		-0.066*
			(0.023)		(0.039)
Formal Self-Emp. Worker			0.421***		0.345***
			(0.037)		(0.068)
Years of schooling	-0.020**	-0.019**	-0.036***		
	(0.008)	(0.008)	(0.008)		
Years of schooling squared	0.004***	0.004***	0.005***		
	(0.000)	(0.000)	(0.000)		
Potential experience	0.031***	0.029***	0.028***	0.027**	0.027**
	(0.003)	(0.003)	(0.003)	(0.012)	(0.011)
Potential experience squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	0.120***	0.117***	0.099***	0.017	0.009
	(0.024)	(0.023)	(0.023)	(0.043)	(0.042)
Year dummy 2004	0.097***	0.107***	0.108***	0.151***	0.154***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Year dummy 2006	0.202***	0.213***	0.217***	0.297***	0.297***
	(0.020)	(0.020)	(0.019)	(0.029)	(0.029)
Constant	0.880***	1.078***	1.045***	1.606***	1.501***
	(0.064)	(0.065)	(0.063)	(0.179)	(0.173)
Observations	5004	5004	5004	5004	5004
R-squared	0.264	0.278	0.317	0.109	0.130
Number of id				2366	2366

Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
The regressions also include seven regional dummies and eight branch activity dummies.

Table A3. Mean Earnings Regressions for Women
Dependent Variable: Log Hourly Real Earnings

VARIABLES	(1) Pooled OLS	(2) Pooled OLS	(3) Pooled OLS	(4) Fixed Effects	(5) Fixed Effects
Informal Worker		-0.306***		-0.197***	
		(0.023)		(0.035)	
Informal Self-Emp.Worker			0.017		0.042
			(0.033)		(0.079)
Informal Wage Worker			-0.330***		-0.178***
			(0.029)		(0.048)
Formal Self-Emp. Worker			0.378***		0.251***
			(0.040)		(0.088)
Years of schooling	-0.005	-0.011	-0.026***		
	(0.010)	(0.010)	(0.010)		
Years of schooling squared	0.003***	0.003***	0.004***		
	(0.001)	(0.001)	(0.001)		
Potential experience	0.025***	0.023***	0.021***	0.028**	0.025**
	(0.002)	(0.002)	(0.002)	(0.013)	(0.013)
Potential experience squared	-0.000***	-0.000***	-0.000***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	0.146***	0.141***	0.110***	0.068	0.060
	(0.023)	(0.022)	(0.022)	(0.091)	(0.090)
Year dummy 2004	0.100***	0.112***	0.114***	0.143***	0.145***
	(0.022)	(0.022)	(0.022)	(0.024)	(0.024)
Year dummy 2006	0.198***	0.211***	0.217***	0.282***	0.289***
	(0.025)	(0.024)	(0.024)	(0.040)	(0.040)
Constant	0.749***	1.062***	1.005***	1.563***	1.510***
	(0.071)	(0.074)	(0.070)	(0.251)	(0.248)
Observations	4070	4070	4070	4070	4070
R-squared	0.241	0.273	0.303	0.084	0.092
Number of id				1955	1955

Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
The regressions also include seven regional dummies and eight branch activity dummies.

Table A4. Pooled Quantile Earnings Regressions For All Workers
Dependent Variable: Log Hourly Real Earnings

VARIABLES	(1) Pooled .10	(2) Pooled .25	(3) Pooled .50	(4) Pooled .75	(5) Pooled .90	(6) Pooled .10	(7) Pooled .25	(8) Pooled .50	(9) Pooled .75	(10) Pooled .90
Informal Worker	-0.234***	-0.232***	-0.225***	-0.253***	-0.305***					
	(0.024)	(0.020)	(0.020)	(0.018)	(0.033)					
Informal Self-Emp.Worker						-0.134***	-0.069**	0.080***	0.190***	0.296***
						(0.039)	(0.027)	(0.028)	(0.036)	(0.042)
Informal Wage Worker						-0.224***	-0.203***	-0.204***	-0.259***	-0.260***
						(0.029)	(0.021)	(0.022)	(0.024)	(0.037)
Formal Self-Emp. Worker						0.114**	0.298***	0.432***	0.582***	0.697***
						(0.055)	(0.034)	(0.035)	(0.042)	(0.047)
Years of schooling	-0.043***	-0.042***	-0.029***	0.009	0.030**	-0.043***	-0.051***	-0.045***	-0.015**	-0.006
	(0.009)	(0.009)	(0.007)	(0.008)	(0.012)	(0.009)	(0.008)	(0.007)	(0.006)	(0.011)
Years of schooling squared	0.005***	0.005***	0.004***	0.002***	0.001	0.005***	0.006***	0.005***	0.004***	0.003***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Potential experience	0.019***	0.026***	0.027***	0.026***	0.028***	0.020***	0.025***	0.025***	0.024***	0.027***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
Potential experience squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.142***	-0.149***	-0.115***	-0.089***	-0.123***	-0.159***	-0.149***	-0.117***	-0.111***	-0.140***
	(0.021)	(0.016)	(0.017)	(0.018)	(0.029)	(0.026)	(0.018)	(0.017)	(0.016)	(0.020)
Married	0.115***	0.101***	0.086***	0.145***	0.178***	0.102***	0.086***	0.068***	0.101***	0.129***
	(0.028)	(0.023)	(0.019)	(0.020)	(0.035)	(0.024)	(0.021)	(0.020)	(0.021)	(0.027)
Year dummy 2004	0.099***	0.077***	0.100***	0.135***	0.156***	0.094***	0.080***	0.118***	0.129***	0.161***
	(0.024)	(0.017)	(0.018)	(0.017)	(0.025)	(0.023)	(0.018)	(0.017)	(0.018)	(0.026)
Year dummy 2006	0.183***	0.181***	0.210***	0.235***	0.263***	0.180***	0.192***	0.226***	0.230***	0.250***
	(0.024)	(0.021)	(0.018)	(0.020)	(0.034)	(0.023)	(0.022)	(0.020)	(0.018)	(0.028)
Constant	0.597***	0.857***	1.077***	1.401***	1.758***	0.594***	0.873***	1.098***	1.291***	1.444***
	(0.078)	(0.059)	(0.058)	(0.062)	(0.115)	(0.074)	(0.056)	(0.056)	(0.057)	(0.099)
Observations	9074	9074	9074	9074	9074	9074	9074	9074	9074	9074

Bootstrapped standard errors (150 replications) are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
The regressions also include seven regional dummies and eight branch activity dummies.

Table A5. Fixed Effects Quantile Earnings Regressions For All Workers
Dependent Variable: Log Hourly Real Earnings
Vietnam VHLSS 2002-2004-2006

VARIABLES	(1) FE .10	(2) FE .25	(3) FE .50	(4) FE .75	(5) FE .90	(6) FE .10	(7) FE .25	(8) FE .50	(9) FE .75	(10) FE .90
Informal Worker	-0.195***	-0.181***	-0.152***	-0.121***	-0.103***					
	(0.015)	(0.009)	(0.002)	(0.010)	(0.015)					
Informal Self-Emp.Worker						0.022	0.072***	0.143***	0.221***	0.283***
						(0.020)	(0.015)	(0.005)	(0.015)	(0.020)
Informal Wage Worker						-0.159***	-0.138***	-0.110***	-0.077***	-0.056***
						(0.019)	(0.012)	(0.005)	(0.012)	(0.017)
Formal Self-Emp. Worker						0.193***	0.262***	0.326***	0.395***	0.466***
						(0.022)	(0.021)	(0.005)	(0.021)	(0.027)
Potential experience	0.031***	0.028***	0.027***	0.026***	0.024***	0.031***	0.027***	0.026***	0.025***	0.022***
	(0.002)	(0.001)	(0.000)	(0.001)	(0.002)	(0.002)	(0.001)	(0.000)	(0.001)	(0.002)
Potential experience squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	0.028	0.028***	0.035***	0.042***	0.048***	0.018	0.027**	0.027***	0.033***	0.040**
	(0.017)	(0.010)	(0.002)	(0.012)	(0.015)	(0.015)	(0.011)	(0.003)	(0.009)	(0.017)
Year dummy 2004	0.184***	0.167***	0.147***	0.140***	0.131***	0.188***	0.165***	0.149***	0.141***	0.132***
	(0.015)	(0.012)	(0.002)	(0.008)	(0.015)	(0.013)	(0.011)	(0.003)	(0.009)	(0.013)
Year dummy 2006	0.320***	0.298***	0.290***	0.285***	0.292***	0.314***	0.296***	0.293***	0.291***	0.289***
	(0.017)	(0.012)	(0.003)	(0.010)	(0.015)	(0.016)	(0.011)	(0.004)	(0.010)	(0.015)
Constant	1.185***	1.411***	1.584***	1.734***	1.962***	1.127***	1.339***	1.493***	1.646***	1.817***
	(0.030)	(0.025)	(0.004)	(0.026)	(0.030)	(0.035)	(0.024)	(0.006)	(0.026)	(0.032)
Observations	9074	9074	9074	9074	9074	9074	9074	9074	9074	9074

Bootstrapped standard errors (150 replications) are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
The regressions also include seven regional dummies and eight branch activity dummies.

Table A6. Pooled Quantile Earnings Regressions for Men
Dependent Variable: Log Hourly Real Earnings

VARIABLES	(1) Pooled .10	(2) Pooled .25	(3) Pooled .50	(4) Pooled .75	(5) Pooled .90	(6) Pooled .10	(7) Pooled .25	(8) Pooled .50	(9) Pooled .75	(10) Pooled .90
Informal Worker	-0.150***	-0.154***	-0.193***	-0.237***	-0.297***					
	(0.032)	(0.027)	(0.027)	(0.025)	(0.047)					
Informal Self-Emp.Worker						-0.016	0.065	0.126***	0.173***	0.330***
						(0.047)	(0.045)	(0.039)	(0.045)	(0.051)
Informal Wage Worker						-0.148***	-0.103***	-0.145***	-0.228***	-0.230***
						(0.038)	(0.035)	(0.029)	(0.027)	(0.040)
Formal Self-Emp. Worker						0.202**	0.368***	0.424***	0.599***	0.744***
						(0.087)	(0.053)	(0.055)	(0.059)	(0.053)
Constant	0.475***	0.868***	1.039***	1.357***	1.624***	0.438***	0.828***	1.065***	1.301***	1.348***
	(0.090)	(0.081)	(0.076)	(0.084)	(0.153)	(0.085)	(0.091)	(0.071)	(0.072)	(0.125)
Observations	5004	5004	5004	5004	5004	5004	5004	5004	5004	5004

Bootstrapped standard errors (150 replications) are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The regressions also include the set of control variables present in Tables A1 to A5 plus seven regional dummies and eight branch activity dummies.

Table A7. Pooled Quantile Earnings Regressions for Women
Dependent Variable: Log Hourly Real Earnings

VARIABLES	(1) Pooled .10	(2) Pooled .25	(3) Pooled .50	(4) Pooled .75	(5) Pooled .90	(6) Pooled .10	(7) Pooled .25	(8) Pooled .50	(9) Pooled .75	(10) Pooled .90
Informal Worker	-0.324***	-0.342***	-0.295***	-0.266***	-0.277***					
	(0.038)	(0.032)	(0.029)	(0.034)	(0.052)					
Informal Self-Emp.Worker						-0.275***	-0.175***	0.063	0.209***	0.364***
						(0.065)	(0.048)	(0.048)	(0.049)	(0.057)
Informal Wage Worker						-0.388***	-0.359***	-0.322***	-0.320***	-0.227***
						(0.063)	(0.046)	(0.043)	(0.044)	(0.054)
Formal Self-Emp. Worker						0.020	0.235***	0.415***	0.585***	0.736***
						(0.078)	(0.067)	(0.053)	(0.055)	(0.059)
Constant	0.431***	0.663***	0.960***	1.428***	1.714***	0.480***	0.678***	1.045***	1.293***	1.346***
	(0.132)	(0.073)	(0.119)	(0.128)	(0.141)	(0.125)	(0.085)	(0.092)	(0.112)	(0.108)
Observations	4070	4070	4070	4070	4070	4070	4070	4070	4070	4070

Bootstrapped standard errors (150 replications) are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The regressions also include the set of control variables present in Tables A1 to A5 plus seven regional dummies and eight branch activity dummies.

Table A8. Fixed Effects Quantile Earnings Regressions for Men
Dependent Variable: Log Hourly Real Earnings

VARIABLES	(1) FE .10	(2) FE .25	(3) FE .50	(4) FE .75	(5) FE .90	(6) FE .10	(7) FE .25	(8) FE .50	(9) FE .75	(10) FE .90
Informal Worker	-0.132***	-0.129***	-0.109***	-0.087***	-0.073***					
	(0.018)	(0.012)	(0.004)	(0.014)	(0.021)					
Informal Self-Emp.Worker						0.125***	0.138***	0.201***	0.265***	0.295***
						(0.027)	(0.018)	(0.008)	(0.021)	(0.025)
Informal Wage Worker						-0.095***	-0.085***	-0.066***	-0.051***	-0.043*
						(0.020)	(0.013)	(0.008)	(0.014)	(0.025)
Formal Self-Emp. Worker						0.246***	0.280***	0.345***	0.415***	0.463***
						(0.030)	(0.028)	(0.009)	(0.029)	(0.033)
Constant	1.154***	1.444***	1.606***	1.766***	2.000***	1.084***	1.346***	1.501***	1.665***	1.879***
	(0.044)	(0.030)	(0.010)	(0.032)	(0.042)	(0.050)	(0.032)	(0.014)	(0.029)	(0.043)
Observations	5004	5004	5004	5004	5004	5004	5004	5004	5004	5004

Bootstrapped standard errors (150 replications) are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The regressions also include the set of control variables present in Tables A1 to A5 plus seven regional dummies and eight branch activity dummies.

Table A9. Fixed Effects Quantile Earnings Regressions for Women
Dependent Variable: Log Hourly Real Earnings

VARIABLES	(1) FE .10	(2) FE .25	(3) FE .50	(4) FE .75	(5) FE .90	(6) FE .10	(7) FE .25	(8) FE .50	(9) FE .75	(10) FE .90
Informal Worker	-0.254***	-0.238***	-0.197***	-0.165***	-0.128***					
	(0.024)	(0.015)	(0.004)	(0.017)	(0.022)					
Informal Self-Emp.Worker						-0.103***	-0.034	0.045***	0.124***	0.225***
						(0.030)	(0.027)	(0.009)	(0.026)	(0.034)
Informal Wage Worker						-0.259***	-0.232***	-0.176***	-0.126***	-0.089***
						(0.029)	(0.021)	(0.010)	(0.023)	(0.028)
Formal Self-Emp. Worker						0.107***	0.190***	0.253***	0.324***	0.442***
						(0.040)	(0.036)	(0.009)	(0.033)	(0.044)
Constant	1.211***	1.403***	1.563***	1.718***	1.897***	1.166***	1.361***	1.508***	1.645***	1.791***
	(0.047)	(0.035)	(0.008)	(0.042)	(0.049)	(0.045)	(0.038)	(0.012)	(0.042)	(0.041)
Observations	4070	4070	4070	4070	4070	4070	4070	4070	4070	4070

Bootstrapped standard errors (150 replications) are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The regressions also include the set of control variables present in Tables A1 to A5 plus seven regional dummies and eight branch activity dummies.