

DO RECRUITMENT TIES AFFECT WAGES?

AN ANALYSIS USING MATCHED EMPLOYER-EMPLOYEE DATA FROM VIETNAM

By

Anna Folke Larsen, John Rand and Nina Torm¹

Department of Economics

University of Copenhagen

Abstract

This paper examines the extent to which recruitment ties affect individual wage outcomes in small and medium scale manufacturing firms. Based on a unique matched employer-employee dataset from Vietnam we find that there is a significant positive wage premium associated with obtaining a job through an informal contact. This finding is robust to the inclusion of standard determinants of wage compensation and is particularly strong among small and urban enterprises. Moreover, we show that the mechanism through which informal contacts affect wages depends on the type of recruitment tie used. We further explore whether the positive wage effect is a case of ‘better match’ or favouritism and find evidence in support of the latter.

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¹ Anna.folke.larsen@econ.ku.dk, John.Rand@econ.ku.dk and Nina.Torm@econ.ku.dk are associated with the Development Economics Research Group (DERG) at the Department of Economics, University of Copenhagen. Address for correspondence: Øster Farimagsgade 5, building 26, DK-1353 Copenhagen K., Denmark. We are extremely grateful for productive and stimulating collaboration with the survey teams from the Vietnamese Institute of Labor Science and Social Affairs (ILSSA) and staff at the Central Institute for Economic Management (CIEM). We would like to thank the participants at the CIEM workshop in Hanoi on 12th May 2009 for valuable comments. Financial support from Danida is appreciated. The usual caveats apply.

1. Introduction

Despite the vast amount of literature on the topic, the question of what determines wages remains one of the most researched topics by labour economists. The human capital model (Mincer, 1974), according to which earnings reflect skill differentials, has generally dominated the interpretation of the earnings function in both developed and developing countries.² However, recent work, much of which is based on matched employer-employee data, has shown that wage-differentials seldom can be explained solely through the human capital framework, revealing the existence of uncompetitive labour markets consistent with efficiency wage models (Abowd and Kramarz, 1999; Söderbom et al., 2005).³

Based on a unique matched employer-employee dataset from Vietnam, this paper examines wage determinants in small and medium enterprises focusing on how the type of recruitment method affects wage outcomes for the individual worker. We distinguish between formal and informal hiring methods, with the former representing employment agencies, advertisements or door to door visits and the latter representing family relations or friends working in the same firm. We define informal contacts as *recruitment ties* and identify two types of ties. A *manager tie* is an informal contact between a manager and an employee whereas a *worker tie* is an informal contact between two employees. More specifically, the purpose of the paper is to investigate (1) the wage effect of using either a manager tie or a worker tie in obtaining a job compared with using a more formal job finding method (2) the mechanism through which recruitment ties affect wages and (3) the productivity effect associated with firms using informal hiring methods.

The results show that traditional wage determinants such as education, experience, gender etc. are significant in small and medium enterprises (SMEs) in Vietnam and that informal contacts play an important role in shaping wage outcomes. Moreover, the mechanism through which contacts affect wages depends on the type of tie used. In terms of firm performance we find that the use of personal contacts in the hiring process does not translate into productivity gains thus pointing to favouritism. We examine whether our results are robust across location and firm size.

² For a survey of the literature on the causal relationship between education and earnings see Card (1999).

³ According to efficiency wage theory firms find it profitable to offer wages that are higher than the market clearing level (Salop, 1976; Lazear, 1979).

The paper is structured as follows. In the subsequent section we provide an overview of the existing literature divided into three main parts. This section also provides the conceptual framework for the analysis. In section three we describe the data followed by an introduction of the empirical strategy in section four. Section five presents the results of the wage analysis followed by a sensitivity analysis in section six. In section seven we report the results from the productivity analysis and finally we conclude in section eight.

2. Literature and conceptual framework

Job search and wages

Since Granovetter's seminal paper (1973) which showed that acquaintances (weak ties) provide more valuable and detailed information than close friends or family (strong ties) and thus are more important in helping individuals find employment, a great amount of work has been done towards validating the significance of *weak ties* as an important job finding method.⁴ In terms of the relationship between informal contacts and wages, findings are rather mixed and vary along individual, demographic and relational dimensions. For instance, studies have shown that the wage effect of weak ties and work-related contacts diminishes when controls are added for measures of worker productivity such as education (Bridges and Villemez 1986; Marsden and Hurlbert 1984). Others including Wegener (1991) and Rosenbaum et al. (1999) find that weak ties do have a positive effect on income but only for high status individuals, whereas for low status individuals, weak ties do not provide better information than strong ties and therefore using the former does not result in higher wages. Along the same lines, Elliot's study (1999) on the use of networks among residents in high and low poverty neighbourhoods finds that the use of informal contacts by less educated workers leads to *lower wages* concluding that similar job searching methods may have different effects on earnings.

In terms of the characteristics of the contacts, Montgomery (1991) shows that workers who possess social ties to others in high-paying jobs tend to have higher wages than those who are less well connected. Similarly, Loury (2006) distinguishes between high and low-wage offer contacts and shows that whereas the former reduce uncertainty and lead to a *better match* in turn resulting in higher wages, a low-wage offer contact acts as a *last resort* and has a negative effect on wages.

⁴ Ioannides and Loury (2004) provide a comprehensive review of the literature on the use of social networks in finding employment.

This, she argues explains why some studies report a positive relation between informal contacts and earnings while others capture a negative correlation.

Others attribute the ambiguous wage effect findings to the lack of attention to the entire network structure, which could result in an underestimation of the weak tie effect on income. For instance, Montgomery (1992) and Tassier (2006) both show that those with a larger proportion of weak ties in their social network receive a larger amount of non-redundant information which in turn has a positive effect on income through increasing their reservation wage.⁵ Moreover, evidence from China (Giles et al., 2006) has found that in transition countries where job search options remain limited, the structure of social networks is particularly important.

The above findings are to some extent captured in the model developed by Calvó-Armengol and Jackson (2007) which shows that the effect of social ties depend on (i) the workers' position in the social network, (ii) how many social ties they have, and (iii) how well-employed those social ties are.

Based on within firm analysis, Simon and Warner (1992) show that those who found their job through an acquaintance in the firm had higher starting salaries than those who found work through a contact outside the firm attributing this to a reduction in employer uncertainty about worker productivity. One of the few studies using matched employer-employee data, Hellerstein et al. (2008) find that networks play an important role in the hiring process since they help workers gain access to specific employers, rather than work opportunities more generally in a given industry. The paper, however, does not examine the impact on wages, which is the focus of this paper.

Firm recruitment methods and wages

Firms may set wages above the market equilibrium in order to increase both the quality and the size of the applicant pool. For instance, Weiss and Landau (1987) show that firms use higher wages as a kind of screening mechanism in order to ensure that the workers hired are of a certain quality. In terms of quantity, Montgomery (1991) uses a model of adverse selection to show that firms may have an incentive to raise wages in order to increase the number of applications, in turn reducing the probability that a vacancy will go unfilled. This study also shows that firms hiring through referral

⁵ See Lippman and McCall (1976) for more on reservation wage theory.

earn higher profits since labour market information is transmitted more efficiently leading to a reduction in job search frictions.

Given the existence of information asymmetry, firms may also offer higher wages so as to avoid shirking. For instance, studies on Ghana and Kenya show that higher wages induce increased worker effort and that larger firms find higher wages particularly useful for motivating workers since alternative labour management mechanisms are too complex (Söderbom et al. 2005; Fafchamps and Söderbom, 2006). If larger firms are less able to accurately observe the quality of labour, yet require higher quality workers (Stiglitz, 1987) this could also explain why recruitment strategies and wages vary by firm size. For instance, Velenchik (1997) finds that in the case of Zimbabwe larger firms tend to use more formal hiring mechanisms compared to smaller firms and this difference in recruitment costs explains the wage-size premium.⁶ Thus, earning differences across firms may partly be related to various structural factors consistent with efficiency wage explanations.

Informal recruitment and productivity

The third strand of literature which this paper draws upon links the use of informal contacts in the recruitment process to the economic performance of the firm. Within this literature, there are both economic and sociological arguments. In terms of the former the main idea, as pointed to above, is that social connections provide high-quality information that improves the match between the job and the person (better match). In other words, informal contacts act as a proxy for information that is difficult to observe such as productivity and thus workers hired via employee referral should *ceteris paribus* be more productive than non-referrals since referrers help to select better-matched employees (Castilla, 2005).

The sociological interpretation is that regardless of whether informal contacts provide more reliable information, the interaction between the referral and the referrer serves to further enrich the match resulting in more productive employees (even after screening and hiring). Thus, whereas economic models attribute productivity largely to personal traits (human capital), modifiable by learning and on-the-job training, sociologists focus on the dynamics within the social group. For instance, studies have shown that quit rates are lower for those who are hired through contacts, controlling for ability

⁶ The fact that earnings tend to rise with firm size is a general finding in the literature (Oi and Idson, 1999; Söderbom et al., 2005).

of the worker (Fernandez, Castilla and Moore, 2000). Moreover, the productivity gains from group norms and culture may provide incentives for employers to recruit through social networks (Burawoy, 1979). Finally, the concept of “loyalty systems” (Granovetter, 2005) whereby the cooperation of workers is derived from identification with the firm has been shown to encourage high standards and productivity. In terms of individual productivity, Castilla (2005) finds that referrals are more productive than non-referrals and that the increase in productivity is not just a short term phenomenon. Similarly, Bandiera et al. (2008) find that worker productivity is significantly higher when workers are socially connected to their managers.

By contrast, social ties may impact negatively on firm performance if workers that are socially connected enforce norms of low effort (Ichino and Maggi, 2000), engage in collusive behavior against the principal (Tirole, 1986) or engage in influence activities with managers they are socially tied to (Milgrom, 1988). Moreover, nepotism theory predicts that workers hired on an informal basis are less productive.⁷ For instance Goldberg (1982) shows how nepotistic firms distort their input choices and earn lower profits than more ‘neutral’ firm. In other words, in cases where managers display favouritism towards workers they are socially connected to this corrupts the information on which jobs are allocated resulting in less productive job assignments. However, favouritism may also generate value for those who exercise it (Prendergast and Topel, 1996), for instance firm owners may get a positive utility from hiring members of their own family, in which case this has to be weighed up against potential negative economic outcomes. Whether the objective of the firm is higher productivity or other forms of utility these arguments suggest that analyzing the effects of social connections in firms could add significant insight in terms of explaining differences in the performances across firms.

These three interrelated strands of literature provide us with the conceptual framework within which to interpret the results of the current analysis. We expect to find a wage effect of having been hired through an informal contact compared to through a formal recruitment method, yet this effect could be either positive or negative in turn leading to different interpretations. For instance, a positive wage effect from using a manager tie could either be interpreted as evidence of the better match theory or a case of favouritism. Similarly, a higher wage associated with using a worker tie may be the result of the worker having access to more and better information in turn strengthening his/her bargaining position and increasing the reservation wage. In both the manager and the worker tie

⁷ The effects of nepotism are often modeled in a similar manner to Becker’s employer prejudice-based theory (1971).

case, a negative wage-effect could be interpreted as an indication of the low social status of the job seeker and/or the informal contact acting as a last resort. Moreover, we anticipate that the mechanism through which the two types of ties affect wages may differ since in addition to affecting the wage directly, the informal contact could also influence the job position and thus indirectly affect the wage returns. Finally, the wage differentials associated with firms using informal contacts as a recruitment method could either be reflected in lower or higher productivity at the firm level. If the use of informal recruitment methods leads to higher wages and increased productivity (as according to human capital theory) then informal hiring produces a better match. On the other hand if using personal contacts in the hiring process leads to higher wages yet lower productivity this suggests a case of favouritism.

3. Data

In order to test our hypothesis about the effect of informal contacts on wages, we proceed with the empirical analysis. The data used in the analysis comes from the fifth round of the “Small and Medium Scale Enterprise Survey in Vietnam” conducted during 2007 under the Danida funded Business Sector Programme Support. The survey was implemented by the Institute of Labour Studies and Social Affairs (ILSSA) under the Ministry of Labour, Invalids and Social Affairs (MoLISA) in collaboration with the Department of Economics at the University of Copenhagen. Similar enterprise surveys have been carried out since the beginning of the 1990s, yet in 2007 it was the first time an employee module was introduced into the survey. Thus, the current study is based on a unique matched employer-employee dataset, which allows for more in-depth analysis of worker- and firm-specific effects on outcomes such as wages.

The 2007 survey covered 2,492 SME manufacturing firms in three urban areas (Hanoi, Hai Phong and Ho Chi Minh City) and seven rural provinces (Ha Tay, Phu Tho, Nghe An, Quang Nam, Khanh Hoa, Lam Dong and Long An).⁸ The employee module of the questionnaire was carried out in a sub-sample of 582 firms covering all ten provinces, different firm size categories, legal ownership status and sectors so as to accurately represent the firm population. In total, 1043 employees completed the employee module which included information on personal characteristics, job features, earnings and other non-wage benefits.⁹ The workers interviewed represented six different

⁸ See Cuong et al. (2008) for details on survey sampling, implementation strategy etc.

⁹ The 1043 workers represent approximately 10 pct of the regular full time labour force in the 582 firms.

categories (managers, professionals, office workers, sales workers, service workers and production workers).

The enterprise survey is composed of two parts: i) a main questionnaire including 150 questions on enterprise characteristics and practises within the survey year and ii) economic accounts for the two previous years. Thus, for the 2007 survey, the corresponding economic accounts data is for end-year 2006 (and 2005) and since we use variables from both questionnaires this time gap could potentially cause problems for the analysis. However, for the wage analysis neither of the two variables from the economic accounts data provide major reason for concern since *other labour costs* is rather constant over time and *number of fulltime employees* has been lagged by one period (to 2005) so as to avoid endogeneity.¹⁰ The wage data from the employee survey is converted into monthly equivalent and deflated with regional consumer price indices.¹¹ After dropping observations with missing information on our variables of interest, we end up with a final sample of 753 employees representing 426 enterprises.¹² For the productivity analysis we use four variables from the economic accounts data; *real value added* (the dependent variable) *number of fulltime employees*, *other labour costs* and *real capital* (independent variables), which given the possibility of reverse causality could potentially lead to interpretation problems. Summary statistics for employee and firm characteristics are represented in table 1 and 2 respectively.

¹⁰ We note, however, that using a lagged variable might give rise to the usual problems with recall data as firms are asked in 2007 about the number of employees in 2005 and in order to address this we check for large discrepancies between the number of employees reported in 2005 and 2006 and drop the few firms with large outliers. Moreover, we check for consistency between economic accounts data from 2006 and main questionnaire information from end-year 2006 and exclude outliers from the analysis.

¹¹ See appendix for details on the “wage cleaning procedure”.

¹² If the information is missing in a non-random way this would introduce a selection bias. We control for this using the Heckman two-step procedure and find no evidence of a selection bias. Results are reported in appendix, table 1A.

Table 1: Summary statistics - Employee characteristics

Number of observations = 753	Mean	Median	Std. dev.
Monthly real wage (1.000 VND)	1361	1204	633.0
Education:			
No education = 1	.015	0	.120
Primary school = 1	.076	0	.265
Secondary school = 1	.268	0	.443
High school = 1	.201	0	.401
Technical certificate/Elementary worker = 1	.069	0	.254
Technical worker without certificate = 1	.041	0	.199
Technical worker/professional secondary = 1	.129	0	.335
University = 1	.202	0	.402
Years in firm	5.3	4	5.1
Worker age	33.2	31	10.3
Gender (male = 1)	.606	1	.489
Trade union (member = 1)	.189	0	.391
Occupation:			
Manager = 1	.101	0	.301
Professional worker = 1	.131	0	.338
Office worker = 1	.100	0	.300
Sales worker = 1	.090	0	.287
Service worker = 1	.057	0	.232
Production worker = 1	.521	1	.500
Recruitment ties:			
Manager tie = 1	.339	0	.474
Worker tie = 1	.235	0	.424

From table 1 we see that the average monthly wage across our sample of 753 workers is 1361 thousand VND per month, which is equivalent to about 80 USD.¹³ In terms of education 20 pct of the workers have a university degree and 24 pct have a type of technical education while less than 2 pct have no education, thus in general the educational level is high. The average period of tenure is just over 5 years and the average worker age is around 33. Men make up just over 60 pct of the employee sample and in terms of the occupation categories 10 pct are managers while just over 50 pct are production workers. Less than 20 pct of workers are members of a union, which is not surprising given that only about 10 pct of firms in Vietnam actually have local trade unions (Clarke et al., 2007). Finally, we note that 34 pct of the workers are recruited through a manager tie, whereas 24 pct are recruited through a worker tie, thus more than half of our sample of workers are recruited through an informal hiring mechanism.

¹³ 1 USD = 17,105.00 VND (14/8/2009)

Table 2: Summary statistics - Firm characteristics

	Number of observations = 753			Number of observations = 426		
	Mean	Median	Std. dev.	Mean	Median	Std. dev.
Fulltime employment in 2005	24.6	13	28.63	15.4	7	21.38
Legal ownership:						
Household = 1 (ref)	.381	0	.486	.606	0	
Private/sole proprietorship = 1	.137	0	.344	.124	0	
Collective/cooperative/partner ship = 1	.061	0	.240	.035	0	
Limited liability company = 1	.376	0	.485	.213	0	
Joint stock company = 1	.045	0	.208	.023	0	
Respondent has at least college education = 1	.348	0	.477	.228	0	
Share of managers (RWF)	.167	.143	.117	.203	.184	.130
Share of professionals (RWF)	.064	.033	.079	.035	0	.067
Share of females (TWF)	.373	.333	.255	.337	.299	.270
Average real monthly other labour costs (1.000)	45	0	123			
Real value added (mill. VND)				595	173	1298
Real capital (mill. VND)				3042	728	9361
Other labour costs (mill. VND)				12	0	45
Share of casual labour (TWF)				.074	0	.167
Share of unpaid labour (TWF)				.218	.2	.208
Firm union				.122	0	.328
Recruitment via personal contacts				.359	0	.480

Note: All prices are in Vietnamese Dong (mill.) from 2006, except for “average real monthly other labour costs” which is in 1000s, so as to be comparable with the wage data. RWF indicates regular work force and TWF indicates total work force.

The first three columns of table 2 show the distribution of the key firm characteristics for the 753 workers in the sample on which our wage analysis is based, while the last three columns show the distribution across the 426 firms on which the productivity analysis is based (only unique firms). When comparing the two datasets, we see that employees have typically been sampled from larger firms with the average number of fulltime employees being 25 in the employee dataset compared with 15 in the *pure* firm dataset. In both datasets the median is significantly lower than the mean, which is explained by the fact that the majority of firms in our sample are micro firms with less than 10 employees. With regard to legal status, households and limited liability companies each account for almost 38 pct of employees, while these categories represent 60 pct and 20 pct respectively of the firms in the pure firm sample. Thus while employees from limited liability companies have been oversampled the opposite is true for household firms.¹⁴

¹⁴ In the total survey sample of 2492 firms, 70% are households and around 18% are limited liability companies

In the firms where the employees are sampled, 35 pct of respondents have at least a college education, while the figure is 23 pct for the pure sample of firms, indicating that workers have been sampled from firms where the respondent has a higher level of education. The share of managers is lower in the employee sample (16.7 pct) than in the firm sample (20.3 pct), while the opposite is true for professionals (6.4 pct and 3.5 pct respectively). Thus, the firms that have participated in the employee questionnaire have a higher proportion of professional workers and a relatively lower share of managers. For both managers and professionals the median is lower than the mean in both datasets and the difference is especially notable for the latter where the median is close to 0 due to the fact that the majority of the firms in the sample have no professional workers. Casual labour, unpaid labour and female labour constitute 7 pct, 22 pct and about 34 pct respectively of the total workforce with the latter being slightly higher in the firms where the employees are sampled.

With regard to the economic accounts data, the average real value added is 595 million VND while the median is less (173 million VND) indicating a rather skewed distribution in terms of productivity due to the large amount of micro firms. Similarly for physical capital where the average is 3042 million VND while the median is only 728 million VND. Across the sample of employees, the average expenditure on other labour costs is 45 thousand per month, equalling 3 pct of the average monthly wage, which is significantly below the 17 pct mandated by the Law on Social Insurance. This, however, is not surprising given that the majority of firms - and especially the household firms - are not officially registered and thus are not obliged to contribute to social security for their employees. At the firm level, employers spend on average 12 million VND on other labour costs per annum and 12 pct of firms have a local trade union. Finally, 36 pct of firms use personal contact as the most important hiring method which corresponds well with the fact that 34 pct of workers (table 1) were hired through a manager tie.

4. Empirical Strategy

Wage

Following the empirical strategy of Troske (1999), we set up an earnings equation in which wages depend on both worker characteristics and the firm characteristics of the individual worker's employer. The function is specified as:

$$\ln w_i = \alpha + X_i\beta_i + Z_i\gamma + T_i\delta + u_i$$

where $\ln w_i$ is the log of real wages of worker i , X_i is a vector of worker i 's characteristics, Z_i is a vector of characteristics for the firm where worker i is employed, T_i is a vector of the recruitment tie of worker i and u_i is a worker-specific error term. In terms of the vector of worker characteristics we firstly include education, since according to both human capital (Mincer 1974) and signalling theory (Spence, 1973) the level of education accounts for a large share of the variation in earnings. Moreover, as mentioned earlier, previous studies (Bridges and Villemez, 1986; Marsden and Hurlbert, 1984) have found that the wage effect of ties disappear once education is controlled for and thus the inclusion of education is particular important for our purpose. Secondly, we control for experience as this is also a key variable in the standards human capital earnings function (Mincer 1974). Since our dataset does not contain sufficient data on years of previous employment, experience is measured by worker age and tenure and for both of these variables we include their squares to allow for a diminishing marginal effect. Thirdly, given that it is common to find gender wage gaps in particular in developing countries (Jones, 2001) we incorporate a gender dummy. Fourthly, we control for union membership, as this is generally associated with a wage premium (Brown and Medoff, 1978; Freeman and Medoff, 1984). Finally, since we would like to test whether the tie effect on wages varies by job function, we add dummies representing the different occupation categories (manager, professional worker, office worker, sales worker, service worker and production worker).

In terms of the vector of firm variables in our earnings equation, we include the "usual suspects": (i) size (represented by the log of number of full-time employee), (ii) legal status of the firm (household, private/sole proprietorship, partnership/collective/cooperative, limited liability, joint stock), (iii) sectors of production and (iv) location (province dummies). In addition, we include the share of managers and professional workers in the firm since theory predicts that a higher average educational level results in increased overall productivity and thus potentially higher pay for all

workers in the firm (Lucas, 1988). Similarly, previous studies have shown that well-educated managers are more likely to hire well-educated workers (Rosenbaum et al., 1999; Simon and Warner, 1992) and we therefore include a dummy indicating whether the respondent of the enterprise questionnaire has at least college education¹⁵. Moreover we control for the share of female workers in the enterprise since this has been shown to have a negative effect on the wages of all workers in the firm (Croson and Gneezy, 2004). Furthermore, since non-wage benefits constitute an important part of the total compensation package in Viet Nam (Quang, 2008) we incorporate the log of average other labour costs (social and health insurance, training and recruitment expenses).

Productivity

In section two we presented several interpretations of both positive and negative wage effects of informal recruitment relating to the theories of better match, favouritism, last resort etc. In order to pin down the most plausible interpretation of our wage results (as reported in section five), we examine firm productivity for the 426 firms used in the wage analysis subsample. As a measure for a manager tie we use information on whether firms use *personal contacts as the most important way of hiring workers*. We do not include a firm equivalent measure of a worker tie in the productivity analysis for two reasons. Aside from the personal contact variable, the other informal recruitment variable available in the enterprise questionnaire - “recommended by friends, relatives or other workers” - does not correspond exactly to the worker tie as defined in the wage analysis. Putting aside this discrepancy, when including this variable we run into multicollinearity problems between this category and the variable ‘personal contacts’ which distorts the standard errors and thus invalidates the results. Hence, only the effect of using a personal contact is examined in the productivity analysis, which may further be justified by the fact that out of the two types of recruitment ties the manager tie is the variable for which we find the largest and most significant effects in the wage analysis.

Since information on individual output is not available in the dataset we cannot perform a direct test of the correspondence between the manager tie effect on wage and per worker productivity.¹⁶ However, the investigation of the firm effect of using different recruitment methods on productivity

¹⁵ We note that the respondent can be either the owner or a manager and take this into account in the regression analysis.

¹⁶ To our knowledge only a few studies have attempted to examine individual productivity (see for instance Castilla, 2005 and Bandiera et al., 2008). The main reason for this is lack of adequate data. Van Biesebroeck (2003) compares firm level productivity and wage premiums with “seemingly unrelated regressions” (SUR), but since we lack data on average schooling and experience in the firms, results from the SUR procedure on our data are inconsistent.

provides an indication of whether a higher/lower wage offered for workers recruited through personal contacts corresponds to higher/lower productivity in the firm. It should be kept in mind that the manager tie could be subject to endogeneity, in the sense that the effect may run from higher productivity to using personal contacts as the main recruitment method rather than vice versa, thus, we cannot identify the causal structure. Nevertheless, if a correlation between the use of personal contacts in the hiring process and productivity can be established this may add insight to the interpretation of the results from the wage analysis. Since this is our motivation for the productivity analysis, we are only interested in identifying the direction and significance of the tie effect and not the magnitude.¹⁷

In order to analyse the effect of personal contacts on productivity we apply the simple Cobb-Douglas production function containing value added (Y), capital (K), labour (L) and total factor productivity (A). Furthermore, we allow for the recruitment tie to have an effect on labour input and for simplicity, we assume the functional form $e^{\theta tie}$:¹⁸

$$Y = AK^\alpha (Le^{\theta tie})^\beta \quad \Leftrightarrow \quad \ln Y = \ln A + \alpha \ln K + \beta \ln L + \beta \theta tie$$

By including a vector of firm control variables (Z_i) to account for differences in total factor productivity, we obtain the following estimation equation:

$$\ln Y_i = \eta + \alpha \ln K_i + \beta \ln L_i + \gamma tie_i + \varphi Z_i + \varepsilon_i$$

where $\ln Y_i$ is the logarithm of real value added of firm i , $\ln K_i$ is the log of real physical assets in firm i , $\ln L_i$ is the logarithm of the number of fulltime employees in firm i lagged by one year, tie is a dummy that equals one if the firms uses personal contacts as the most important way of hiring workers, Z_i is a vector of firm control variables (see below) and ε_i is a firm specific error term.

The effect of the recruitment tie is then captured by $\theta = \gamma/\beta$. As tie is a dummy variable, L is multiplied by e^θ when $tie=1$, hence, the labour force becomes more efficient when $\theta > 0$. However, replacing the mathematical constant e with a parameter to be estimated yields $\ln(\rho^{\theta tie}) = \theta \ln(\rho) tie$, such that θ and ρ cannot be uniquely identified but still reveal the direction of the effect of the tie. Hence, the simplifying assumption of the functional form $e^{\theta tie}$ does not alter the qualitative results.

¹⁷ A proper interpretation of the magnitude of the effect is unfeasible with the available data since this requires a SUR analysis (Ibid.).

¹⁸ The modelling of the tie effects is inspired by the modelling of fringe benefits in Dale-Olsen (2006)

The vector of firm control variables, Z_i , consists of the same firm control variables as in the wage equation (see above) enabling us to compare the results from the two analyses. There are only minor differences between the specifications. Firstly, the logarithm of the *average other labour costs* variable is replaced with the logarithm of *total other labour costs* measured on a yearly basis in order to be comparable with *real value added*. Secondly, the share of unpaid workers out of total workforce is included since this is expected to be negatively correlated with the efficiency of the labour force in the firm. Moreover, the share of casual workers out of total workforce is included since the number of fulltime employees in firm i , L_i , does not accurately reflect the size of the workforce if firm i employs a large share of casual labour. Finally, we incorporate a dummy for whether the firm has a trade union as a counterpart to the union membership dummy in the earnings regressions.

5. Results

Employee characteristics

Table 3 presents OLS estimates of the wage regression based exclusively on employee characteristics. Column (1) represents the baseline earnings regression including the usual wage determinants (educations, experience, tenure, age etc.). In column (2) we add recruitment ties - our main variable of interest, and in column (3) we control for different occupation categories.

Firstly, we examine the baseline results in column (1). In terms of the key human capital variables we see that all of the education levels are significant at a 1 pct level. Since *university* is the reference category the negative coefficients on the education variables is an indication that higher levels of education are associated with higher wages, which is in line with human capital theory (Mincer 1974). In terms of the other human capital variables, tenure and age are both highly significant and have the expected concave effect with a maximum at 50 years of age and 10 years of tenure. The former is in accordance with other developing country studies (Söderbom et al., 2006), while the latter is somewhat lower (Serneels, 2008).

The results also reveal the existence of a significant gender wage gap with male earnings being about 16 pct higher than for females. This is a common finding in earnings analysis (Jones, 2006) and corresponds to the findings of a recent study on Vietnam (Lui, 2004). The latter study argues that the gender wage gap is largely due to discrimination, while other studies have shown that the wage gap reflects a genuine productivity gap (Hægeland and Klette, 1999). We further note that

being member of a union does not have a significant effect on wage returns, which is in contrast to the general finding that unionization is positively associated with wages.¹⁹ However, in Vietnam unions are typically headed by managers (rather than a senior worker), and thus may have a limited ability to stand up to employers on behalf of their members (Clarke et al., 2007). In addition, according to some estimates only 20% of unionized private enterprises have collective agreements, which may also explain the insignificance of the trade union variable (Clarke et al., 2007).

In column (2) we add the tie variables to the baseline earnings regression. This does not alter the results significantly in terms of the employee characteristics described above. In column (3) we add the occupation categories and find a highly significant and positive wage premium for managers, professional and sales workers as compared to production workers. The premium is especially notable for managers who receive a 47 pct higher wage than production workers *ceteris paribus*. The inclusion of occupation categories reduces the education coefficients as expected given the strong positive correlation between these two variables. In fact, for the three technical categories, the entire wage return can be explained by occupation, while for lower levels of education the partial effects remain significantly negative. In addition, the significance of the tenure variable is reduced which could be explained by the fact that managers generally stay longer in a firm.²⁰

Firm characteristics

Table 4 presents OLS estimates from the earnings regression when key firm characteristics are included. Column (1) includes only firm characteristics; in column (2) we add employee characteristics while recruitment ties and occupation categories are added in columns (3) and (4) respectively. Firstly, we note that the size-wage premium is positively significant which is in line with the general finding that earnings tend to rise with firm size (Oi and Idson, 1999; Söderbom et al., 2005).²¹ In terms of legal status, it is interesting to note that partnership/collective/cooperatives have significantly lower wage returns than household firms. The educational level of the respondent of the enterprise questionnaire (either the owner or a manager) has no significant effect on wages.²²

¹⁹ Brown and Medoff (1978) find that unionized workers on average earn 30 pct more than non-unionized workers.

²⁰ The average number of years in firm for a manager is 8.4 years which is 2.9 years more than the total sample average.

²¹ We have lagged the size variable in order to avoid endogeneity, yet using the contemporaneous firm size does not alter the qualitative results.

²² To capture the effect of the manager having a high education, we control for whether the respondent is owner or manager and find that there is no significant effect of either (results not reported). This could be an outcome of two effects cancelling out: A positive network effect of highly educated managers employing highly educated workers from

However, the share of professional workers in the firm has a highly significant and positive effect on wages as expected. The share of female workers has a large negative effect on wages in the firm, which could either be an indication that female workers are less productive or that women are employed in less productive enterprises.

Moreover, the positive correlation between other labour costs and wages is an indication that high-wage firms, which are generally the larger firms, offer higher levels of benefits compared with low-wage (and smaller) establishments.²³

In column (2), the addition of employee characteristics changes the firm variable coefficients. Firstly, there is a significant reduction in the firm size-wage effect which is consistent with the hypothesis that firm size is positively correlated with worker ability (Abowd et al., 1999; Troske, 1999). Once we control for the education of the worker, the firm size thus has a minor effect on wages. We also note a reduction in the significance of the share of professionals. Without employee characteristics, the share of professionals represents the likelihood that the worker in question has a high level of education and this effect vanishes in column (2). Yet, the share of professionals is still the most powerful explanatory firm characteristic, indicating a positive spill over effects from professionals to other workers in the firm. Lastly, the significance of the social benefit variable falls to a 10 pct level consistent with the fact that the more highly educated workers are more likely to receive benefits.

his or her university network together with a negative effect stemming from the fact that highly educated managers face less information problems and are better at finding the correct match between the worker and the job.

²³ This finding is in accordance with Vietnamese legislation according to which firms with less than 10 fulltime employees are not obliged to contribute to social and health insurances (Quang, 2008). Furthermore, we note that excluding other labor costs from the regression or interchanging it with other variables to capture social benefits does not alter the qualitative results.

Table 3: Wage regressions with employee characteristics

Dependent variable: ln(real wage)	(1)	(2)	(3)
<i>Education:</i>			
No education = 1	-0.733*** (0.083)	-0.740*** (0.086)	-0.587*** (0.114)
Primary school = 1	-0.551*** (0.063)	-0.554*** (0.062)	-0.328*** (0.082)
Secondary school = 1	-0.466*** (0.045)	-0.471*** (0.044)	-0.269*** (0.067)
High school = 1	-0.394*** (0.046)	-0.404*** (0.047)	-0.239*** (0.067)
Technical certificate/Elementary worker = 1	-0.307*** (0.057)	-0.308*** (0.057)	-0.128 (0.078)
Technical worker without certificate = 1	-0.234*** (0.083)	-0.243*** (0.079)	-0.128 (0.082)
Technical worker/professional secondary = 1	-0.169*** (0.039)	-0.167*** (0.039)	-0.073 (0.048)
Years in firm	0.024*** (0.007)	0.022*** (0.007)	0.018** (0.007)
Years in firm ² /100	-0.123*** (0.030)	-0.112*** (0.029)	-0.109*** (0.033)
Worker age	0.022*** (0.008)	0.024*** (0.008)	0.024*** (0.007)
Worker age ² /100	-0.022** (0.011)	-0.025** (0.011)	-0.028*** (0.010)
Gender (male = 1)	0.161*** (0.028)	0.158*** (0.028)	0.165*** (0.027)
Trade union (member = 1)	0.088 (0.054)	0.099* (0.052)	0.078 (0.048)
<i>Occupation:</i>			
Manager = 1			0.467*** (0.057)
Professional worker = 1			0.179*** (0.067)
Office worker = 1			0.096* (0.058)
Sales worker = 1			0.224*** (0.046)
Service worker = 1			-0.004 (0.046)
<i>Recruitment ties:</i>			
Manager tie = 1		0.111*** (0.034)	0.077** (0.031)
Worker tie = 1		0.088*** (0.031)	0.098*** (0.030)
Observations	753	753	753
R-squared	0.311	0.326	0.407

Note: OLS estimates, cluster robust standard errors in parentheses. Constant included in all regressions. For *education*, *occupation* and *recruitment ties*, the reference categories are *university*, *production worker* and *formal recruitment channels*, respectively. ***, **, * indicate significance at a 1, 5, and 10 pct level.

Recruitment ties

When we only include employee characteristics in the earnings regression, we find that both manager and worker tie effects are positive and significant at a 1 pct level (table 3 column 2). The wage differentials associated with being recruited through a manager or a worker tie in comparison with through more formal channels are 11.1 pct and 8.8 pct, respectively. This confirms the findings in the literature that social networks have an important and positive effect on wages. In column (3) we add occupation categories and find that the manager tie effect falls in both magnitude and significance whereas the worker tie effect is enhanced. When adding the firm characteristics in table 4 we see a similar pattern. In column (3) the manager tie effect is significant at a 1 pct level, but it loses its significance when occupation is introduced in column (4). By contrast, the worker tie effect becomes significant when we control for occupation, though only at a 10 pct. level. The introduction of firm characteristics has thus – not surprisingly – reduced the explanatory power of the recruitment ties. We investigate this issue further in the sensitivity analysis.

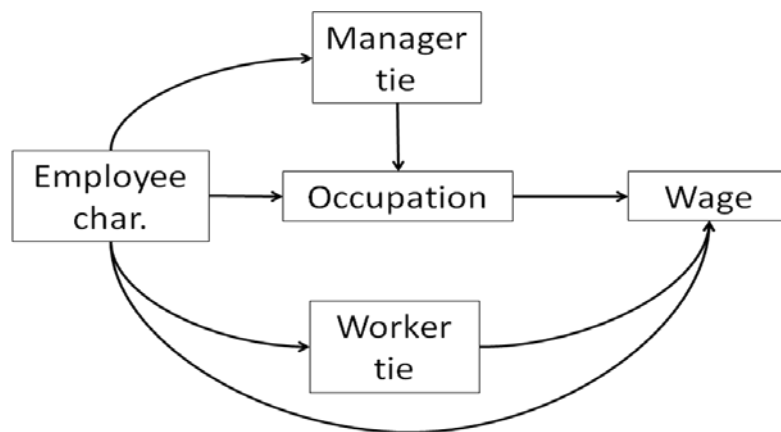
Table 4: Firm characteristics

Dependent variable: ln(real wage)	(1)	(2)	(3)	(4)
ln(employment)	0.077**	0.057**	0.066**	0.056**
	(0.031)	(0.028)	(0.028)	(0.027)
<i>Legal ownership</i> : Private/sole = 1	0.025	-0.004	-0.010	-0.061
	(0.053)	(0.052)	(0.052)	(0.051)
Collective etc. = 1	-0.196**	-0.246**	-0.240**	-0.276***
	(0.093)	(0.108)	(0.107)	(0.099)
Limited liability = 1	-0.056	-0.143**	-0.147**	-0.185***
	(0.068)	(0.065)	(0.064)	(0.061)
Joint stock = 1	0.054	-0.054	-0.059	-0.090
	(0.116)	(0.115)	(0.117)	(0.111)
Respondent higher education = 1	0.012	-0.007	0.001	0.016
	(0.043)	(0.040)	(0.040)	(0.039)
<i>Total work force share</i> : Female workers	-0.348***	-0.243***	-0.241***	-0.280***
	(0.082)	(0.083)	(0.083)	(0.079)
<i>Regular workforce shares</i> : Managers	-0.051	0.044	0.033	-0.020
	(0.195)	(0.172)	(0.171)	(0.172)
Professional workers	1.067***	0.748**	0.730**	0.710**
	(0.326)	(0.292)	(0.288)	(0.285)
ln(average real other labour costs)	0.031***	0.019*	0.017*	0.020**
	(0.010)	(0.010)	(0.010)	(0.010)
<i>Occupation</i> : Manager = 1				0.492***
				(0.057)
Professional worker = 1				0.205***
				(0.063)
Office worker = 1				0.109**
				(0.055)
Sales worker = 1				0.231***
				(0.044)
Service worker = 1				-0.040
				(0.048)
<i>Recruitment ties</i> : Manager tie = 1			0.088**	0.043
			(0.034)	(0.030)
Worker tie = 1			0.038	0.052*
			(0.031)	(0.029)
Sector dummies	YES	YES	YES	YES
Province dummies	YES	YES	YES	YES
Employee characteristics	NO	YES	YES	YES
Observations	753	753	753	753
R-squared	0.241	0.413	0.420	0.504

Note: OLS estimates, cluster robust standard errors in parentheses. Constant included in all regressions. For *occupation* and *recruitment ties*, the reference categories are *production worker* and *formal recruitment channels*, respectively. Employee characteristics include variables in column 1 table 3. The estimates of the ties effect stay within their 90 pct confidence bounds when each employee characteristic is successively excluded. Also the qualitative results are robust to the inclusion of outliers, however the manager effect in (4) turns significant at a 10 pct level. ***, **, * indicate significance at a 1, 5, and 10 pct level, respectively.

It is noteworthy how the tie effects change when we introduce occupation, a finding which is robust across table 3 and 4: Without occupation the manager tie effect is prevalent but when occupation is controlled for, the manager tie effect is reduced whereas the worker tie effect increases. Figure 1 provides an illustration of this mechanism.

Figure 1: How ties affect wages



This pattern is explained by the fact that workers who use a manager tie to obtain their job are more likely to become managers or sales workers (see table 5) as confirmed by running a multinomial logit estimation (see appendix, table 2A). Since both sales workers and managers receive a significant wage premium compared to production workers, this explains the positive effect on the wage from using a manager tie when not accounting for occupation. Hence, the manager tie effect works through occupation and disappears once this is controlled for. This result can be interpreted in different ways. Firstly, the manager may have some information about the worker's ability to manage a firm beyond the observed employee characteristics which induces the manager to hire the worker in a manager position. However, if the manager tie reduces asymmetric information problems, the manager tie would also have an effect within occupation, which we do not observe. Secondly, when the worker has a personal relation to the manager he or she may have the bargaining power to be employed in a high yielding job position. Thirdly, the effect could be interpreted as reflecting favouritism in the sense that managers employ friends or relatives in high-paid positions.

Table 5: Recruitment method for selected variables

	Recruitment method (%)		
	manager tie = 1	worker tie = 1	formal channels = 1
Full sample	33.9	23.5	42.6
<i>Occupation:</i>			
Manager	51.3	10.5	38.2
Professional worker	26.3	23.2	50.5
Office worker	29.3	26.7	44.0
Sales worker	41.2	19.1	39.7
Service worker	23.3	25.6	51.1
Production worker	33.2	26.0	40.8
<i>Selected sectors:</i>			
Basic metal	71.4	21.4	7.2
Recycling	100.0	0.0	0.0
<i>Location:</i>			
Urban provinces	34.8	26.6	38.6
Rural provinces	32.8	19.9	47.3

On the other hand, as illustrated in figure 1, the worker tie effect works *within* occupation. As reported in table 5 only 10.5 pct of the managers are recruited through a tie to another worker in the firm which provides an explanation for why the worker tie effect is insignificant when occupation is not accounted for. The fact that managers earn higher wages but do not generally use worker ties counteracts the worker tie wage premium. However, when controlling for occupation we find evidence of a worker tie wage premium which could be interpreted in different ways. Firstly, as the worker is recruited through another worker in the firm, he/she could have access to information that will put him/her in a better bargaining position in the wage negotiation process. Secondly, if the worker has a large network he/she will optimize among the job offers in the network and choose the highest yielding offer. By contrast to the manager tie wage effect, the worker tie effect does not work through occupation, which is not surprising given that for instance a production worker is unlikely to have enough influence to refer another worker to a higher job position. Moreover, if a worker has the possibility of obtaining a higher position he/she would most probably want to fill that position him/herself rather than recommending it to a friend. In other words, using a worker tie does not increase the chance of being employed in a highly paid job position. In fact, the two occupations with the highest wage premiums – managers and sales workers – are also those that are least likely to have been hired through a worker tie.²⁴ Overall, our results are consistent with the

²⁴ Estimates from the multinomial logit regression confirm that a worker tie does not have a significant effect on occupying a certain occupation (see appendix table 2A).

general literature (as reviewed in section two) that using informal contacts has a positive effect on wage levels across occupations.

6. Sensitivity analysis

Occupation

To further investigate how the tie effects change across occupation we split the sample into two categories: production and non-production workers and run the regression corresponding to column (3) in table 4 on the two subsamples. Results are presented in table 6.

Table 6: Production workers and non-production workers

Dependent variable: Log real wage	(1) Production workers	(2) Non-production workers
<i>Recruitment ties:</i>		
Manager tie = 1	-0.002 (0.038)	0.146** (0.059)
Worker tie = 1	0.066* (0.037)	0.025 (0.055)
Occupation	-	NO
Firm characteristics	YES	YES
Employee characteristics	YES	YES
Observations	392	361
R-squared	0.362	0.417

Note: OLS estimates, cluster robust standard errors in parentheses. Constant included in all regressions. For recruitment ties the reference category is formal recruitment channels. Employee and firm characteristics include variables in column 1 table 3 and 4 respectively. ***, **, * indicate significance at a 1, 5, and 10 pct level, respectively.

The findings of table 3 and 4 are largely supported by the results in table 6. When regressing on production workers only, we find that the worker tie effect is predominant and significant at a 10 pct. level. Production workers who are recruited through recommendation by another co-worker obtain a wage premium of 6.6 pct. The manager tie effect is insignificant.

Among non-production workers – not controlling for their occupation – the manager tie effect is again apparent and somewhat more striking. A worker who uses a manager tie receives a wage premium of 14.6 pct. An even larger estimate is found when regressing on managers only (not reported), yet these results are not reliable as there are only 76 managers in the sample.

Sectors

As we saw earlier, the manager tie effect disappears when we add the firm characteristics, controlling for occupation, (comparing results in table 3 column 3 and table 4 column 4). In order to

pin down the firm characteristics that reduce the manager tie effect we exclude first the sector dummies and then the province dummies (results not reported). We find that two sectors dummies, namely the dummies for the recycling sector and the basic metals sector, drive the difference between the results in table 3 and 4. This is due to the fact that these two sectors both reveal high wage premiums as compared to the food and beverage sector and they both rely heavily on manager ties as a recruitment method (table 5). This is an indication that in firms with lucrative manager wages, managers are more likely to hire friends and relatives in other manager positions within the firm – a sort of rent sharing favouritism. Excluding the provinces from the regression enhances the worker tie effects both with and without controlling for occupation, calling for a further examination of the importance of location.

Location

We split our sample into rural and urban provinces and estimate the regressions as in table 4 column (3) and (4) on the two subsamples to see how the tie effects differ between rural and urban firms. Results are presented in table 7. We find that none of the tie effects turn out significant at a 5 pct level in the rural subsample, yet when occupation is controlled for the manager tie effect is significant at a 10 pct level and has a *negative* sign. This could be interpreted as evidence of the *last resort* theory whereby using informal contacts has a negative effect on wages (Loury, 2006). It is not unlikely that such contacts are more predominant in rural areas. By contrast, among the urban enterprises we find stronger positive effects than on the full sample and in particular the manager tie effect survives the introduction of occupation. Thus, the wage effect of having been hired through knowing the manager seems to vary across location.

Table 7: Difference between rural and urban areas.

Dependent variable: Log real wage	(1) Rural	(2) Urban	(3) Rural	(4) Urban
<i>Recruitment ties:</i>				
Manager tie = 1	-0.027 (0.049)	0.178*** (0.049)	-0.070* (0.042)	0.122*** (0.042)
Worker tie = 1	0.036 (0.045)	0.064 (0.044)	0.042 (0.039)	0.090** (0.042)
Occupation	NO	NO	YES	YES
Firm characteristics	YES	YES	YES	YES
Employee characteristics	YES	YES	YES	YES
Observations	351	402	351	402
R-squared	0.475	0.482	0.565	0.563

Note: OLS estimates, cluster robust standard errors in parentheses. Constant included in all regressions. For recruitment ties the reference category is formal recruitment channels. Employee and firm characteristics include variables in column 1 table 3 and 4 respectively. ***, **, * indicate significance at a 1, 5, and 10 pct level, respectively.

Firm size

In table 8 we divide the sample into micro, small and medium scale enterprises,²⁵ and redo the regressions corresponding to column 3 and 4 in table 4. The results show that that the manager tie effect is prevalent *only* among small scale enterprises where it is significant at a 5 pct level and larger than in the full sample estimate. When controlling for occupation the manager tie effect in small enterprises disappears just as in the full sample estimates. However, in neither of the splits does the worker tie effect emerge when we control for occupation; among medium scale enterprises the estimate is fairly high but nevertheless insignificant. As for the wage premiums associated with occupation, we note that the manager wage premium is particularly high in medium scale enterprises and lowest among the small scale enterprises, however still large and significant at a 1 pct level. Also the wage premiums for professionals and sales workers are highest for the medium scale enterprises, whereas the service worker wage premium is only positive and significant among the micro scale enterprises.

²⁵ Our definition of micro, small and medium scale enterprises follows current World bank and Vietnamese Government definitions. Micro-enterprises have up to 10 employees, small-scale enterprises up to 50, and medium-sized enterprises up to 300 employees. These definitions are broadly accepted by the Vietnamese Government (see Government decree no. 90/2001/CP-ND).

Table 8: Differences across firm size categories

Dependent variable: ln(real wage)	(1) Micro	(2) Small	(3) Medium	(4) Micro	(5) Small	(6) Medium
<i>Occupation:</i>						
Manager = 1				0.489*** (0.115)	0.354*** (0.064)	0.728*** (0.134)
Professional worker = 1				0.006 (0.128)	0.209** (0.087)	0.288** (0.123)
Office worker = 1				0.022 (0.133)	0.096 (0.071)	0.120 (0.114)
Sales worker = 1				0.096 (0.070)	0.187*** (0.060)	0.299*** (0.105)
Service worker = 1				0.249* (0.134)	-0.057 (0.069)	0.016 (0.104)
<i>Recruitment ties:</i>						
Manager tie = 1	0.024 (0.048)	0.129** (0.058)	0.068 (0.132)	-0.004 (0.043)	0.085 (0.054)	0.049 (0.089)
Worker tie = 1	0.023 (0.052)	-0.061 (0.048)	0.146 (0.087)	0.039 (0.050)	-0.032 (0.047)	0.138 (0.083)
Firm characteristics	YES	YES	YES	YES	YES	YES
Employee characteristics	YES	YES	YES	YES	YES	YES
Observations	326	306	121	326	306	121
R-squared	0.417	0.582	0.716	0.480	0.634	0.837

Note: OLS estimates, cluster robust standard errors in parentheses. Constant included in all regressions. For *occupation* and *recruitment ties*, the reference categories are *production worker* and *formal recruitment channels*, respectively. Employee and firm characteristics include variables in column 1 table 3 and table 4 respectively. The estimates of the ties effect stay within their 90 pct confidence bounds when each employee characteristic is successively excluded. Also the qualitative results are robust to the inclusion of outliers, however the manager effect in (4) turns significant at a 10 pct level. ***, **, * indicate significance at a 1, 5, and 10 pct level, respectively.

Throughout the analysis, we find a significant positive wage premium for those workers who are hired through a manager tie when we do not control for occupation. When we split the data into subsamples, it is unveiled that these results are driven by urban and small scale firms. As for the worker tie, the effect is weaker and less robust; significant at a 5 pct level only among urban enterprises.

The fact that we find tie effects predominantly among urban enterprises may be explained by that fact that urban areas are characterised by larger and denser networks, in turn facilitating coordination and the matching of workers and firms.²⁶ However, whether the network is used to reduce the information gap and obtain a better match or whether the network is merely used to help

²⁶ Potential explanations for the higher urban wage premium may be found in density and coordination theories according to which urban areas are characterized by more efficient job search and matching strategies. See Yankow (2006) for a review of the literature.

friends and relatives to obtain a job cannot be revealed from the wage analysis. Hence, we proceed by investigating how informal hiring methods relate to firm productivity.

7. Productivity results

Basic variables

The results from the productivity regressions are presented in table 9. The first column contains estimates from a baseline productivity regression and in column two a dummy representing recruitment via personal contacts is added. We divide the sample into firms operating in rural and urban provinces and the results from regressions on these subsamples are represented in column 3 and 4 respectively. Finally, we split the sample into firm size categories and column 5 and 6 contain estimates from regressions on micro and small scale firms respectively. As there are only 32 medium scale enterprises in the sample, a regression on this subset is not feasible.²⁷

In the Cobb-Douglas production function a common assumption is constant returns to scale, yet this does not hold in our sample since the sum of the parameters for capital and employment is less than one (table 9). Decreasing returns to scale, however, is not a surprising finding given that in the full sample of firms (2492) from which our subsample of 426 firms is drawn “only” 27.5 pct of firms have power driven machinery and only 7.5 pct of firms had renewed their plant technology between 2005 and 2007 (Coung et al., 2008). This may explain why the output elasticity with respect to capital is lower than the common macroeconomic estimate of one-third.²⁸ There is substantial variation in the output elasticity with respect to capital across location - almost double among rural enterprises and half among urban enterprises as compared to the full sample estimates. This is an indication of overinvestment in physical capital in urban enterprises, while capital scarcity among rural enterprises increases the importance of capital input for the size of output.²⁹

Another common finding in macroeconomics is an output elasticity of two-thirds with respect to labour, which is in general accordance with the results presented in table 9.³⁰ However, the labour-output intensity is much lower among micro scale enterprises, which could be interpreted as an indication of underemployment. It is indeed possible that the main *raison d'être* of micro enterprises is simply employment creation and not necessarily productive employment generation.

²⁷ Since there are more parameters than observations standard errors cannot be obtained.

²⁸ According to Sørensen and Whitta-Jacobsen (2005) a capital share that is one-third of factor income is a stylized fact.

²⁹ The mean capital-labour ratio among urban enterprises is more than double that of rural enterprises.

³⁰ Ibid.

Turning to legal ownership, the collective/cooperative/partnership companies are significantly less productive than household firms corresponding with the results from the wage regressions in table 4. The other legal categories do not perform significantly different from household firms in the full sample, but among the rural enterprises joint stock companies appear much less productive than household firms.³¹ Among the urban enterprises, the private/sole proprietorship companies stand out as more productive than household firms, but the difference is only significant at a 10 pct level.

In terms of human capital effects the results show that when the respondent of the enterprise questionnaire³² has at least a college education the firm is in general more productive - an effect that is most pronounced for urban enterprises and micro enterprises in particular. There is a positive correlation between productivity and other labour costs which is not surprising as other labour costs are part of the total compensation package and more productive firms can afford to pay higher compensation. However, there is also the possibility of reverse causality with the increase in productivity arising from the fact that the firms provide social benefits, which in turn raise motivation and effort on behalf of workers.

The share of casual workers out of the total workforce has a strong positive productivity effect as expected given that it accounts for an extra contribution to the labour force. On the other hand, the share of unpaid workers is negatively correlated with productivity which is not surprising since unpaid workers are presumed to be less productive than paid workers. This correlation is most distinct among micro scale enterprises where the share of unpaid workers is also the highest.

The share of managers in the regular workforce has a negative effect on productivity, however in general it is not significant. However, for rural and small enterprises the effect is particularly pronounced and significant at a 5 pct. and 10 pct. level respectively. Especially for small enterprises the effect is large and though the standard error is large too, this result is indeed noteworthy. It indicates that for a small enterprise with 20 full-time employees and four managers, the enterprise could obtain more than 30 pct. higher value added if two of the managers worked either as office, sales, service or production workers. At the same time, as may be recalled from the wage analysis managers are found to receive a significant wage premium and although the lowest wage premium is found among small scale enterprises (35 pct), this is still higher than the wage differential

³¹ Since there are only two joint stock companies in the sample this result should not be given too much weight.

³² The respondent of the questionnaire is either the owner or the manager of the firm.

between having only primary education compared with a university degree (33 pct) (see table 3, column 3). Hence, small scale enterprises seem to have an inefficiently high share of managers.

The share of professional workers has a large positive effect on value added (except for among micro firms), however the variation is also large and none of the estimates are significant. Finally, the data does not show support for a productivity effect of having a firm level trade union which is not surprising given the reasons provided earlier in the wage analysis. In general, the estimated productivity effects of the basic variables seem in line with standard theory and the Vietnamese context, and we now turn to analysing the effect of the recruitment method which is the key purpose of the productivity analysis.

Recruitment via personal contacts

All the results reported in table 9 show a *negative* correlation between productivity and recruiting workers through personal contacts, yet not all the estimates are significant. The full sample results in column 2 show that firms recruiting through personal contacts have 11 pct lower value added than other firms on a 10 pct significance level. This is not necessarily evidence of a causal relationship going from recruitment ties to productivity since reverse causality is possible. In a situation where friends and relatives are hired regardless of their abilities and prerequisites for the job and thus underperform this would be consistent with a negative causal effect from recruitment ties to productivity. However, if the correlation is due to an omitted variable bias, for instance if the firm is a family business mainly concerned with providing employment for friends and relatives rather than maximising profits, this would result in a negative correlation with value added but a positive correlation with recruitment ties, thus creating a negative bias in our results. This scenario could be interpreted as an example of the “utility argument” referred to in section two according to which firm owners get a positive utility from hiring members of their own family (Prendergast and Topel, 1996).

In the wage analysis the direction of causality is not an issue since wages are determined after the recruitment method. As may be recalled, we found a positive wage effect of having been hired with a manager tie which could be interpreted as either better match or favouritism. Since the two interpretations may have different implications for firm performance, the productivity analysis can help us to establish which theory is most valid. If the manager tie wage premium is due to a better match we would expect the use of a tie to increase productivity, whereas if the favouritism effect is

predominant this may have no effect or perhaps a negative effect on productivity in firms that recruit through personal contacts. The weak evidence of a negative correlation between productivity and recruitment ties across firms points to the favouritism interpretation, regardless of the causality of the productivity results.

We should keep in mind that since the productivity analysis is performed on firm averages, the results do not preclude the better match theory to work *within* firms. Productivity differences within a firm is not taken into account due to the lack of data on individual productivity and the enterprise measure of the recruitment tie relies on ‘personal contacts’ as ‘the most important way of hiring workers’. Thus, we cannot rule out a positive productivity effect from a recruitment tie within a firm, for instance arising from a manager hiring a friend as a sales worker because he/she has particular skills for selling. However, if the better match interpretation is predominant in the firm, we would expect to find a positive correlation between productivity and recruitment through personal contacts which we do not.

Turning to the different splits of the sample, we find the negative productivity effect to be particularly pronounced among rural enterprises – triple of the urban effect and significant on a 5 pct level. This is to some extent ‘reassuring’ since we also find the manager tie to have a negative effect on wages among the rural enterprises. The negative wage effect was interpreted as the tie working as a last resort which is in line with the results on productivity. Among the urban firms, the productivity effect is still negative, however no longer significant. Since we do not find evidence of a positive effect, this result points to a favouritism effect among urban firms where the tie wage premium is highest and most prevalent. That is, urban enterprises recruiting through personal contacts are as productive as other firms, but the workers recruited with a manager tie earn a higher wage – this seems like a clear indication of favouritism.

In terms of the different firm size categories, we find that there is no significant effect of recruitment via personal contacts among micro enterprises, which is in correspondence with the wage analysis. However, it is worth noting how small scale enterprises drive the negative productivity effect while employees from the same firms are driving the positive manager tie effect on wages as reported in table 8. This surely supports the idea that favouritism is the reason for higher wages in small firms for workers hired through a personal contact to the manager.

From the productivity analysis we conclude that there seems to be evidence of favouritism effects in the Vietnamese labour market in the sense that employees hired through manager ties earn higher wages and firms hiring through personal contacts have lower productivity. Although we do not find support for the theory that hiring through personal contacts ensures more productive workers (better match) we cannot exclude the possibility that this theory might operate within firms.

Perhaps most alarming is the finding that among small scale enterprises where the manager tie effect on wage is strongest, the negative productivity effect from hiring through personal contacts is also most prevalent. Furthermore, recall that being hired with a manager tie increases the possibility of being hired as manager,³³ and managers receive a substantial wage premium. Thus, the finding that small scale enterprises have an inefficiently large share of managers in their workforces, stresses the possible favouritism interpretation.

³³ See appendix, table 2A

Table 9: Cobb-Douglas regressions

Dependent variable: ln(real value added)	(1)	(2)	(3) Rural	(4) Urban	(5) Micro	(6) Small
ln(real capital)	0.132*** (0.028)	0.129*** (0.027)	0.215*** (0.047)	0.058* (0.032)	0.113*** (0.029)	0.137* (0.073)
ln(employment)	0.630*** (0.071)	0.633*** (0.071)	0.607*** (0.101)	0.644*** (0.095)	0.410*** (0.098)	0.621** (0.309)
<i>Legal ownership:</i>						
Private/sole = 1	0.111 (0.111)	0.114 (0.109)	-0.006 (0.146)	0.297* (0.176)	0.074 (0.122)	0.181 (0.236)
Collective etc. = 1	-0.439** (0.199)	-0.466** (0.199)	-0.062 (0.214)	-0.584* (0.310)	-0.330 (0.263)	-0.295 (0.388)
Limited liability = 1	0.005 (0.141)	0.001 (0.140)	-0.176 (0.202)	0.063 (0.211)	0.005 (0.183)	-0.011 (0.306)
Joint stock = 1	0.040 (0.210)	0.019 (0.211)	-0.348* (0.195)	0.195 (0.355)	0.145 (0.288)	0.182 (0.403)
Respondent higher education = 1	0.182** (0.087)	0.171** (0.087)	-0.140 (0.142)	0.263** (0.133)	0.317*** (0.088)	0.039 (0.159)
ln(real other labour costs)	0.112*** (0.037)	0.108*** (0.037)	0.126*** (0.045)	0.132** (0.064)	0.163** (0.072)	0.151** (0.064)
<i>Total workforce shares:</i>						
Casual workers	0.591*** (0.214)	0.579*** (0.211)	0.445* (0.254)	0.904** (0.377)	0.499** (0.215)	0.838** (0.415)
Unpaid workers	-0.577** (0.247)	-0.546** (0.247)	-0.447 (0.356)	-0.451 (0.382)	-0.773*** (0.255)	-1.028 (1.170)
Female workers	-0.516*** (0.143)	-0.501*** (0.143)	-0.224 (0.213)	-0.641*** (0.205)	-0.259* (0.146)	-0.780* (0.423)
<i>Regular workforce shares:</i>						
Managers	-0.494 (0.313)	-0.466 (0.315)	-0.955** (0.479)	0.179 (0.429)	-0.435 (0.301)	-3.121* (1.801)
Professional workers	0.759 (0.713)	0.825 (0.701)	1.534 (1.147)	1.378 (0.840)	-0.657 (0.849)	1.891 (1.143)
Firm union = 1	-0.016 (0.163)	-0.018 (0.163)	-0.284 (0.239)	0.057 (0.249)	0.498 (0.487)	-0.146 (0.272)
Recruit via personal contacts = 1		-0.111* (0.056)	-0.186** (0.078)	-0.065 (0.097)	-0.043 (0.067)	-0.276* (0.140)
Sector dummies	YES	YES	YES	YES	YES	YES
Province dummies	YES	YES	YES	YES	YES	YES
Observations	426	426	239	187	269	125
R-squared	0.823	0.824	0.830	0.800	0.666	0.688

Note: OLS estimates, cluster robust standard errors in parentheses. Constant included in all regressions. For *legal ownership* the reference category is *household*. ***, **, * indicate significance at a 1, 5, and 10 pct level, respectively.

8. Conclusion

This paper has examined wage determinants in Vietnamese SMEs focusing on the wage effect of obtaining a job through an informal contact. In terms of the traditional wage determinants our results are mostly in line with theory and other studies in both developing and developed countries. For instance, we find substantial wage gains associated with both education and experience and a positive correlation between wages and firm size. In addition, while the share of professionals in the firm has a positive effect on wages, the share of females has a negative effect. Moreover as expected, the results reveal the existence of a significant gender wage gap. We do not find evidence of a higher wage for union members, which may be explained by the fact that trade unions are relatively weak and collective bargaining agreements not very common among SMEs in Vietnam.

With regard to recruitment ties, we find evidence of a positive wage effect for a worker who is hired through an informal contact to a manager or a worker, yet the effect of the two types of ties work through different mechanisms. Workers who are hired through knowing a manager are more likely to be hired into a higher wage position (a manager or a sales worker position), whereas within the same occupation there is no significant wage difference compared with having been recruited through a formal channel. However, when a worker is hired through knowing another worker in the firm this does not affect the occupation that the person is hired into, yet the job taker will receive a higher wage within the same occupational category. By splitting the sample into various subsamples, we find that urban firms and small firms drive the results. We establish that the positive wage premium associated with having been recruited through a manager or a worker tie could be interpreted either as an indication of a better match scenario or a case of favouritism.

In order to pin-down the more plausible interpretation of the positive wage effect, we investigate the productivity effect associated with firms using personal contacts as the main method of recruitment. The results from the productivity analysis suggest that favouritism may provide the most credible explanation for the wage premium, since using personal contacts in the hiring process has a negative effect on firm level productivity. This finding is especially striking among small scale enterprises where the positive manager tie effect on wages is also largest.

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Appendix

When cleaning the wage data from the employee survey we have two overall aims: First and foremost, we want to control for any measurement errors such as typos or mistaken wage units. Second, we want to eliminate large outliers to ensure that our estimation results are not driven by single observations.

Firstly, we discover inconsistencies in the specification of the wage time unit. Four workers have indicated an hourly wage time unit while the wage that they specify seems to correspond more to a monthly wage. However, the correspondence is not clear so we choose to drop these four observations. Moreover, 14 production workers have stated a daily wage time unit, but when their wage is converted into a monthly wage they earn more than 9 mill. VND, which is substantially above the highest production worker wage. We change their wage time unit into 'month' since this results in reasonable monthly wages around the sample median of 1.2 mill. VND and corresponds with the wages of co-workers in the same firm.

In order to account for different numbers of work days and hours, we convert wages into a monthly equivalent. This is done using the sample means of 6 work days pr week and 8 work hours pr day. We do not correct the wage of workers who report 7 work days since full-time workers are by law entitled to one day off (Lee and Eyraud, 2008).

We have cleaned the wage data with reference to wage ranges as reported in Lee and Eyraud (2008). Production workers are reported to receive a monthly wage of minimum 0.35 mill. VND whereas management board members receive a minimum of 2.5 mill. VND. In our sample, non-manager and non-professional observations with wages outside of this range are scrutinized. When examining the observations, several variables are taken into account. First of all, we check whether we have data for other workers in the firm to see if the wage reported is in correspondence with the wages of the co-workers in the firm. Next, we compare the employee wage with the average wage in the firm which can be computed from the enterprise data on total wage bill and number of full-time employees. To ensure that the computed average wage provides an accurate indication we also compare the number of full-time employees with the size of the total labour force, since a lot of part-time workers in the firm would drive up the average wage. The ownership type and province of

the firm are also considered together with the job function, gender and educational level of the employee.

Observations that are clearly unreasonable are dropped from the sample. For example one observation is a male production worker in a limited liability company in Ha Tay who receives a wage of 3.5 mill. VND. This wage is the double of the wage of the manager in the same firm and more than three times the average wage, which is highly unlikely for a production worker. It is not possible to say whether it is the category 'production worker' or the wage which is misreported, but the observation is dropped as it is surely an outlier. Documentation on the dropped observations can be obtained upon request.

In figure 1-6 we provide histograms of the wage distributions by job function. The histograms are drawn after the wage has been converted into the monthly equivalent and the wage time units are corrected, yet before further cleaning. Observations dropped in the cleaning process are marked with a red circle and it should be evident from the histograms that these observations are indeed outliers. Outlier observations marked with a green circle are excluded in the main analysis as they appear as outliers, yet they have been included in a robustness analysis and we find that they do not affect the results remarkably.

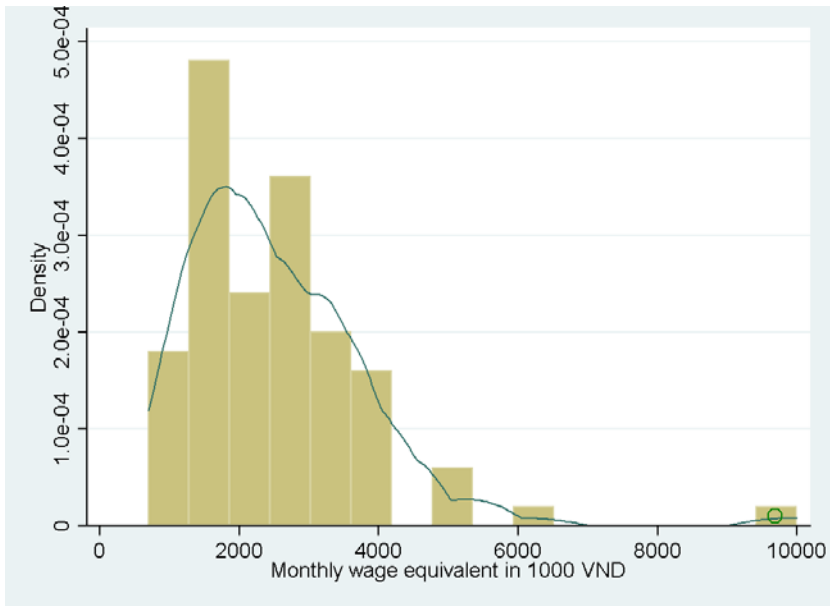


Figure 1A: Histogram of manager wage

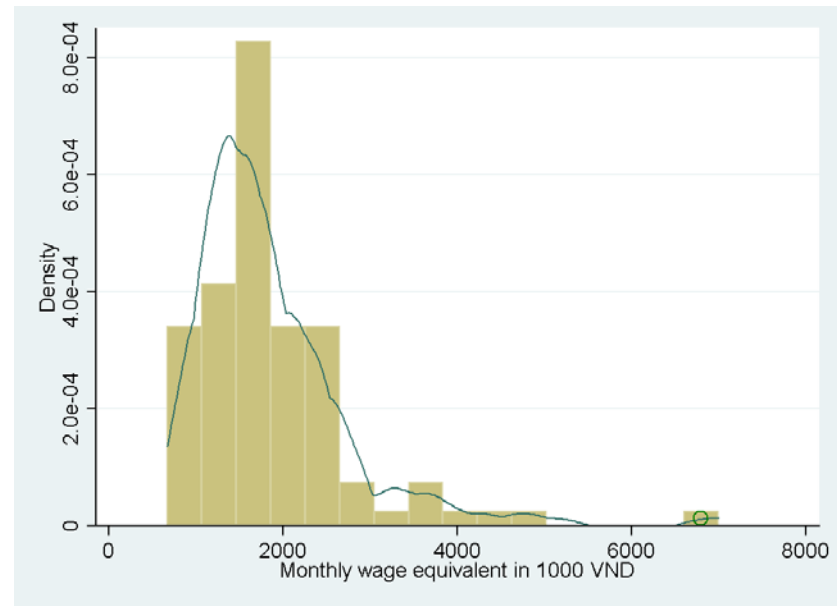


Figure 2A: Histogram of wage of professional worker

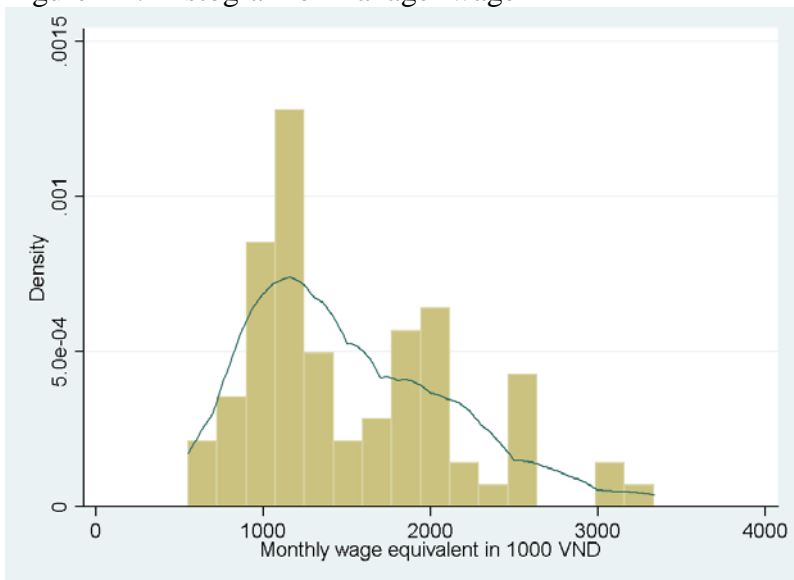


Figure 3A: Histogram of wage of office worker

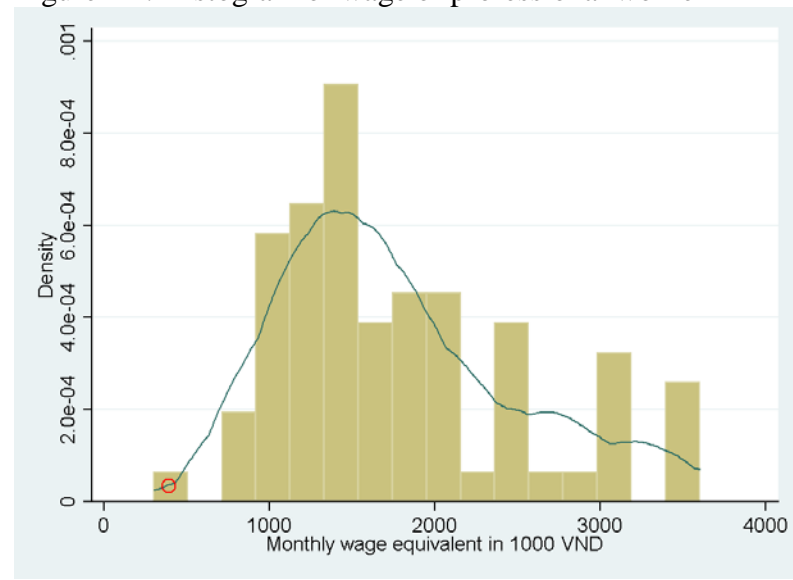


Figure 4A: Histogram of wage of sales worker

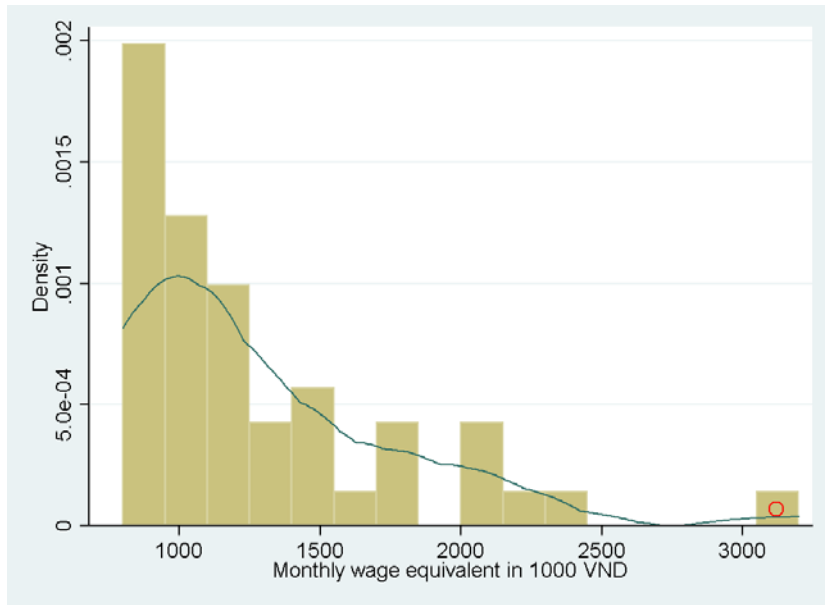


Figure 5A: Histogram of wage of service worker

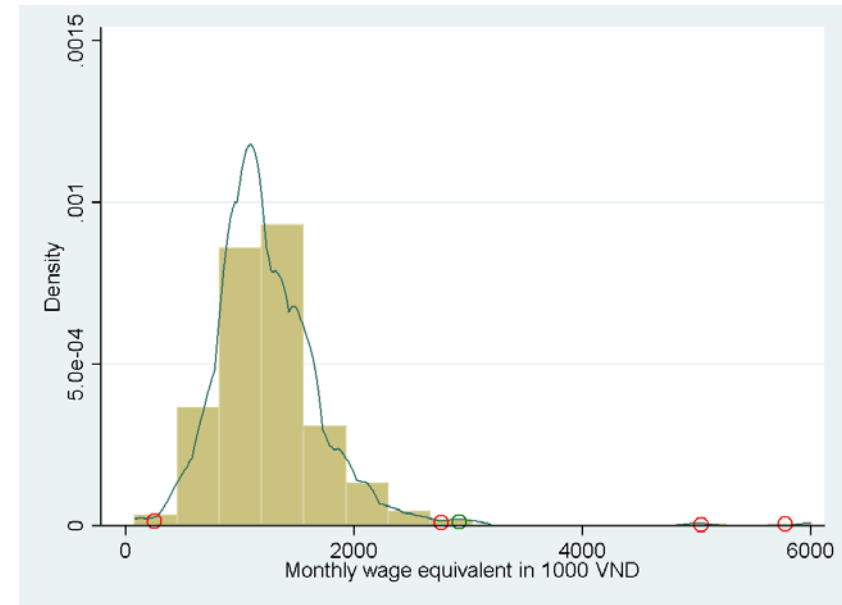


Figure 6A: Histogram of wage of production worker

Table 1A: Heckman two-step selection estimation

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Log real wage	Selection regression	Mills ratio	Log real wage	Selection regression	Mills ratio
Firm char.	YES	YES		YES	YES	
Sector dummies	YES	YES		YES	YES	
Province dummies	YES	YES		YES	YES	
Employee char.	YES	YES		YES	YES	
mantie	0.085*** (0.032)	0.724*** (0.180)		0.044 (0.029)	0.858*** (0.209)	
worktie	0.038 (0.034)	1.165*** (0.322)		0.057* (0.030)	1.182*** (0.387)	
manager				0.479*** (0.054)	-2.462*** (0.327)	
professional				0.184*** (0.057)	-1.673*** (0.606)	
office				0.096* (0.052)	-1.133* (0.606)	
sales				0.213*** (0.047)	-1.464*** (0.318)	
service				-0.052 (0.053)	5.608 (0.000)	
Lambda			-0.055 (0.097)			-0.003 (0.079)
Constant	6.878*** (0.163)	-0.783 (1.063)		6.717*** (0.155)	-0.044 (1.313)	
Observations	846	846	846	846	846	846

Note: Heckman two-step selection estimation, without exclusion restrictions. Standard errors in parentheses. ***, **, * indicate significance at a 1, 5, and 10 pct level, respectively.

Table 2A: Multinomial logistic regression of how ties affect occupation

Dependent variables:	<i>Manager</i>	<i>Professional</i>	<i>Office</i>	<i>Sales</i>	<i>Service</i>
Manager tie	1.815** (0.549)	0.753 (0.549)	1.127** (0.509)	0.942** (0.395)	-0.479 (0.537)
Worker tie	-1.105* (0.658)	-0.708 (0.638)	0.098 (0.482)	-0.521 (0.419)	-0.694 (0.587)
Employee characteristics					
Firm characteristics					
Observations	753				
Log pseudolikelihood	-523.74				
Pseudo R2	0.5198				

Note: Partial multinomial logit estimates. Production Worker is the base outcome. Constant is included. Employee and firm characteristics include variables in column 1 table 3 and 4 respectively. Cluster robust standard errors in parenthesis. ***, **, * indicate significance at a 1, 5, and 10 pct level, respectively.