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DO RECRUITMENT TIES AFFECT WAGES?

AN ANALYSIS USING MATCHED EMPLOYER-EMPLOYEE DATA FROM VIETNAM

By

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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, when controlling for standard determinants of wage compensation. Moreover, we show that the mechanism through which informal contacts affect wages depends on the type of recruitment tie used. The findings are robust across location, firm size categories and different worker types.

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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.[1] However, recent work, much of which is based on matched employer-employee data, has shown that wage-differentials can seldom be explained solely through the human capital framework, revealing the existence of uncompetitive labour markets consistent with efficiency wage models (Abowd and Kramarz, 1999).[2]

Based on a unique, matched employer-employee dataset from Vietnam, this paper examines wage determinants in small and medium enterprises (SMEs) and focuses 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. Furthermore, 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 twofold: (1) to investigate whether using either a manager tie or a worker tie in obtaining a job is positively associated with higher wages compared with using more formal job finding methods; (2) the mechanism through which recruitment ties affect wages.

Our results show that traditional wage determinants such as education, experience, gender etc. are important in Vietnam, and that informal contacts play a central role in shaping wage outcomes in small and medium enterprises (SMEs). Moreover, the mechanism through which contacts affect wages depends on the type of tie used. Workers hired through a manager tie are more likely to be hired into higher wage positions (occupation effect), but given occupation choice there is no significant wage differential as compared with individuals recruited through formal channels. By contrast, worker ties do not affect the occupation of recruited individuals; however "worker tie" employees will receive a higher wage within the same occupational category.

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[1] For a survey of the literature on the relationship between education and earnings see Card (1999).
[2] 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 a selective overview of the existing literature. In section three, we describe the data followed by an outline 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 present the conclusion.

2. Literature review

Firm recruitment methods and wages

According to efficiency wage theory, firms 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 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 a number of African countries show that higher wages induce increased worker effort, and that larger firms find higher wages particularly useful for motivating workers since alternative labour management mechanism 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.[3] Thus, earning differences across firms may partly be related to various structural factors consistent with efficiency wage explanations.

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[3] 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).

Informal contacts and wages

Granovetter (1973) 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. Following Granovetter's seminal paper, 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 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 have a positive effect on income, but only for high status individuals. By contrast, for low status individuals, weak ties do not provide better information than strong ties, and therefore using the former to obtain a job does not result in higher wages. Along the same lines, Elliot (1999) studies the use of networks among residents in high and low poverty neighbourhoods and finds that the use of informal contacts by less educated workers leads to *lower* wages. Thus, similar job searching methods may have different effects on earnings depending on the job-seeker's socio-economic status.

In terms of the characteristics of the informal contact, Montgomery (1991) argues 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 the former reduce uncertainty and lead, in turn, to a *better match* resulting in higher wages. Oppositely, if the contact acts as a *last resort* (low-wage offer), this has a negative effect on wages. This difference could explain why some studies report a positive relation between informal contacts and earnings while others capture a negative correlation.

The ambiguous wage effect findings have also been attributed to a lack of attention to the individual's 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

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

wage.[5] The role of information in determining wages may be particularly important in developing countries where formal channels for the exchange of labour market information are often less developed. Murphy and Strobl (2008) find that in the Case of Trinidad and Tobago, 22 pct. of workers earn less than the maximum wage available (given their characteristics) due to a lack of information. Moreover, using the example of China Giles et al. (2006) find that in transition countries where job search options remain limited, the structure of social networks is particularly important.

One of the few studies, at least to our knowledge, using matched employer-employee data to analyse the labour market effects of networks is Hellerstein et al. (2008). They 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.[6]

3. Data

The data used in the analysis comes from a SME survey in Vietnam conducted during 2007.[7] The survey covered 2,492 enterprises in ten provinces: Ho Chi Minh City (HCMC), Ha Noi, Hai Phong, Long An, Ha Tay, Quang Nam, Phu Tho, Nghe An, Khanh Hoa and Lam Dong. In all areas covered by the survey, the sample was stratified by ownership form to ensure that all types of non-state enterprises, including both officially registered (with a business registration licence) household, private, cooperative, limited liability and joint stock enterprises and non-official household firms were represented. For reasons of implementation, the survey was confined to specific areas in each province/city. Subsequently, a stratified random sample was drawn from a consolidated list of enterprises.[8] Additional details on the sampling and implementation strategy is provided in Cuong et al. (2008).

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

[6] Several of the findings highlighted in this section are 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.

[7] The World Bank SME Department currently operates with three groups of SMEs: micro, small and medium scale firms. Micro-enterprises have between 1 and 10 employees, small-scale enterprises between 11 and 50 employees, and medium-size enterprises between 51 and 300 employees. These definitions are broadly accepted by the Vietnamese Government (see Government decree no. 90/2001/CP-ND on "Supporting the Development of Small and Medium Enterprises"). In what follows, we apply these definitions.

[8] Reliable population statistics on household firms do not exist for 2007. Weights for registered household (HH) firms could be obtained using the Establishment Census from 2002 (GSO, 2004). However, the Establishment Census covers only registered individual household businesses, which have a Business Licence issued by a District Business Register

The 2007 survey covers both enterprise and employee specific characteristics, the latter from a separate employee module. 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 employee module 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, 1,043 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 occupation 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.[10] After dropping observations with missing information on our variables of interest, we end up with a final sample of 753 employees representing 426 enterprises.[11] Summary statistics for employee and firm characteristics are represented in Table 1, Panel A and B respectively.

Office. The non-registered (informal) household firms in our sample do have not such a licence, and are therefore not covered in official Census statistics. Therefore, we find it most appropriate to report un-weighted estimates in the analysis. A sample selection bias may thus be present in our total dataset as we cannot be sure that the numbers of such household firms are drawn proportionally to the number at the province level and the different types of enterprises in the country.

[9] The 1,043 workers represent approximately 10 pct. of the regular full time labour force in the 582 firms.

[10] For the 2007 survey, the corresponding economic accounts data is for end-year 2006 (and 2005) and since we use variables from both datasets 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. 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. The wage data from the employee survey is converted into monthly equivalent and deflated with regional consumer price indices. See appendix for additional details on the "wage cleaning procedure".

[11] This may be considered to be a relatively large amount of observations being dropped due to missing and odd answers. However, we do not find any systematic drop-out along the dimensions that are most relevant in the sampling procedure: firm size, location, legal ownership form and sector. Out of the 290 worker observations that were dropped 185 were due to missing wage information, and 45 of these were managers. If this information is missing in a non-random way, for instance if managers are reluctant to disclose wage information, this could lead to biased results. In order to rule out selection bias we carried out a Heckman selection analysis. Selection bias could also arise as a result of missing information on recruitment method, if for instance managers with higher wages have a tendency to not report recruitment ties this would underestimate our reported results. However, only one observation has missing information on recruitment method (and on the wage) and this is a production worker. Results are available upon request.

Table 1: Employee and firm characteristics

Panel A: Employee characteristics			
	Mean	Median	S.D.
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
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
Number of observations		753	

Panel B: Firm characteristics						
	Employees			Firms		
	Mean	Median	S.D.	Mean	Median	S.D.
Fulltime employment in 2005	24.6	13	28.6	15.4	7	21.4
Legal ownership: Household = 1	.381	0	.486	.603	0	.490
Share of professionals (RWF)	.064	.033	.079	.035	0	.067
Share of females (TWF)	.373	.333	.255	.331	.299	.270
Real average monthly other labour costs (1.000 VND)	45	0	123	25	0	82
Recruitment via personal contacts	.316	0	.465	.357	0	.480
Number of observations		753			426	

Note: 1 USD = 16,000 VND (31/12/2007). Real wages deflated using regional deflators. Other labour costs are measured in real Vietnamese Dong, deflated using regional deflators. RWF indicates regular work force and TWF indicates total work force.

Panel A of Table 1 shows that the average monthly wage across our sample of 753 workers is 1,361 thousand VND per month, which was equivalent to about 85 USD in 2007[12]. In terms of education, 20 pct. of the workers have a university degree and 24 pct. have some kind of technical education while less than 2 pct. have no education, thus in general the educational level is high. The average

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[12] 1 USD = 16,000 VND (31/12/2007).

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.[13] Finally, we note that 34 pct. of the workers have been recruited through a manager tie, whereas 24 pct. have been recruited through a worker tie, thus more than half of our the workers in the sample have been recruited through an informal hiring mechanism. This is line with other developing country studies. For instance Serneeels (2007) finds that among young Ethiopian men 40 pct. of job searches happen through social networks.[14]

The first three columns of Panel B in Table 1 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. We see that employees have typically been sampled from larger firms with the average number of fulltime employees being 25 in the employee sample compared with 15 in the firm sample. Moreover, with regard to legal status, 38 pct of employees are working in households, while this category represents 60 pct. of the firms.[15] The proportion of professional workers is higher in the employee sample than in the firm sample, indicating that employees have been sampled mostly from firms with a more highly educated workforce. This may explain the higher share of workers with a university degree in the sample (Panel A Table 1). Female workers represent 33 pct. of the total workforce in the firms, and the share is slightly higher in the employee sample.[16] At the firm level, the average expenditure on other labour costs is 25 thousand VND per month, which is lower than among the employees (45 thousand VND per month) indicating that employees have been sampled primarily from firms with higher non-wage labour costs. These figures are substantially below the 15 pct. (of the wage) social security contribution mandated by Law.[17] This, however, is not surprising given that a considerable number of household firms are not officially registered, and thus are not obliged to contribute to social security for their employees. Finally, 36 pct of firms use personal contacts as the most important

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[13] Managers are underrepresented compared to in the full firm sample (this is also the case prior to dropping managers with no wage information), which could be related to managers being reluctant to disclose wage information and therefore choosing not to participate in the survey. Since self-selection could lead to biased estimates, we control for this using the Heckman selection analysis and find no evidence of selection bias. Results are available upon request.

[14] We also included a dummy for whether the worker is member of a trade union or not, yet this variable did not provide additional explanatory power and therefore it was omitted from the analysis.

[15] In the analysis we do not include legal status of the firm as an explanatory variable, as legal structure and worker composition (share of professional workers) are highly (negatively) correlated.

[16] We also added the casual worker share and the share of unpaid workers, however the inclusion of these variables did not alter the results, and thus were left out of the analysis.

[17] For a comprehensive review of the Labour Code see Felipe and Hasan (2006).

hiring method which corresponds well with the fact that 34 pct of workers (Panel A Table 1) were hired through a manager tie.

4. Empirical Strategy

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:

$$(1) \qquad \ln w_i = \alpha + X_i \beta_i + Z_i \gamma + T_i \delta + u_i$$

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 first 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. Second, 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. Third, given that it is common to find gender wage gaps, in particular in developing countries (Jones, 2001), we incorporate a gender dummy. 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 addition, we include a set of occupation-recruitment tie interaction terms in selected specifications.

In terms of the vector of firm variables in our earnings equation, we include: (i) size (represented by the log of the number of full-time employee), (ii) sectors of production (defined at the ISIC 2-digit level, Revision 3) and (iii) location (province dummies). In addition, we incorporate the share of professional workers in the firm based on the idea that the average educational level in the firm should be positively correlated with overall productivity and wages (Lucas, 1988). We also 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, 2009). Furthermore, since non-wage benefits constitute an important part of the total compensation package in Vietnam (Quang, 2008) we incorporate the log of average other labour costs (social and health insurance, training and recruitment expenses).

5. Results

Employee characteristics

Table 2 presents OLS estimates of the wage regression based exclusively on employee characteristics. Column (1) represents the baseline earnings regression including the usual wage determinants (education, 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. Finally, in column (4) we include interaction terms between the recruitment ties and the different occupation categories. First, 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 both human capital and signalling theory (Mincer, 1974; Spence, 1973). 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 11 years of tenure. The former is in accordance with other developing country studies (Fafchamps and Söderbom, 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 Liu (2004). The latter study argues that in Vietnam, the gender wage gap is largely due to discrimination, whereas other studies have shown that the wage gap reflects a genuine productivity gap (Hægeland and Klette, 1999).

Table 2: Wage regressions with employee characteristics

Dependent variable: ln(real wage)	(1)	(2)	(3)	(4)
No education = 1	-0.762***	-0.771***	-0.607***	-0.625***
	(0.081)	(0.084)	(0.113)	(0.119)
Primary school = 1	-0.578***	-0.584***	-0.346***	-0.357***
	(0.062)	(0.061)	(0.082)	(0.084)
Secondary school = 1	-0.489***	-0.496***	-0.284***	-0.292***
	(0.043)	(0.042)	(0.067)	(0.069)
High school = 1	-0.410***	-0.422***	-0.249***	-0.255***
	(0.045)	(0.046)	(0.067)	(0.069)
Technical certificate/Elementary worker = 1	-0.322***	-0.325***	-0.137*	-0.148*
	(0.057)	(0.056)	(0.078)	(0.081)
Technical worker without certificate = 1	-0.250***	-0.260***	-0.142*	-0.141*
	(0.084)	(0.080)	(0.083)	(0.083)
Technical worker/professional secondary = 1	-0.166***	-0.164***	-0.072	-0.081*
	(0.039)	(0.039)	(0.049)	(0.049)
Years in firm	0.025***	0.022***	0.019***	0.018***
	(0.007)	(0.007)	(0.007)	(0.007)
Years in firm^2/100	-0.118***	-0.108***	-0.106***	-0.105***
	(0.028)	(0.027)	(0.032)	(0.031)
Worker age	0.024***	0.026***	0.026***	0.025***
	(0.008)	(0.008)	(0.007)	(0.007)
Worker age^2/100	-0.024**	-0.027**	-0.030***	-0.028***
	(0.011)	(0.011)	(0.010)	(0.009)
Gender (male = 1)	0.158***	0.155***	0.164***	0.169***
	(0.028)	(0.028)	(0.027)	(0.027)
Occupation:				
Manager = 1			0.475***	0.412***
			(0.058)	(0.078)
Professional worker = 1			0.185***	0.131
			(0.067)	(0.080)
Office worker = 1			0.109*	0.139*
			(0.058)	(0.080)
Sales worker = 1			0.234***	0.229***
			(0.047)	(0.071)
Service worker = 1			0.002	0.047
			(0.046)	(0.053)
Recruitment ties:				
Manager tie = 1		0.103***	0.071**	0.052
		(0.034)	(0.031)	(0.037)
Worker tie = 1		0.087***	0.097***	0.092**
		(0.031)	(0.030)	(0.037)
Ties * Occupation	NO	NO	NO	YES
R-squared	0.305	0.319	0.403	0.411
Observations	753	753	753	753

Note: Dependent variable: (log) real wage. 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.

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, office and sales workers as compared to production workers. The premium is especially notable for managers who receive a 48 pct. higher wage than production workers, ceteris paribus. As expected, the inclusion of occupation categories reduces the education coefficients given the strong positive correlation between these two variables. We comment on the recruitment tie variables separately following the section on firm characteristics below.

Firm characteristics

Table 3 presents OLS estimates from the earnings regression when key firm characteristics are included. Column (1) includes only firm characteristics; in column (2) we add the employee characteristics from Table 2 (column 1) while recruitment ties and occupation categories are added in columns (3) and (4) respectively. In column (5), interaction terms between the recruitment ties and the occupation categories are included. First, 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).[18] Similarly, the share of professional workers in the firm is positively correlated with wages as expected, whereas the share of female workers has a negative association. The latter 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 consistent with the fact that social security contributions are calculated as a percentage of the wage.[19]

The results in column (2), show that the firm variable coefficients change when we include employee characteristics. First, there is a substantial 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. Similarly, we also note a reduction in the significance of the share of professionals.[20] Lastly, the significance of the social benefit variable falls consistent with the fact that more highly educated workers are more likely to receive benefits (since they tend to work in firms that are more likely to provide benefits).

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

[19] We note that excluding other labor costs from the regression or replacing it with either: (i) a dummy for whether the firm pays health insurance, (ii) a dummy for whether the firm pays social insurance or (iii) a dummy for whether the firm pays social benefits in general does not alter the qualitative results.

[20] Without employee characteristics, the share of professionals represents the likelihood that the worker in question has a high level of education.

Recruitment ties

Recall from Table 2 that when running the earnings regression with employee characteristics only, we find that both manager and worker tie effects are positive and significant at a 1 pct. level (column 2). The wage differentials associated with being recruited through a manager or a worker tie in comparison with through more formal channels are 10 pct. and 9 pct., respectively. This confirms the findings in the literature that social networks are positively associated with wages. In Table 2, 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, indicating that the manager tie wage premium is in part accounted for by occupations. This is further supported by the insignificance of the manager tie in Table 2, column (4) when the interaction terms between the recruitment ties and occupations are included. However, out of the 12 interaction terms only the one between the professional occupation category and the worker tie is significant, at a 10 pct. level (results not reported). [21]

Table 3 with firm characteristics shows a similar pattern. In column (3) the manager tie effect is significant at the 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) and this holds when the interaction terms are included in column (5) (it even increases slightly in magnitude). However, none of the interaction terms are significant (results not reported). Overall, the introduction of firm characteristics has reduced the explanatory power of the recruitment ties.

It is noteworthy how the tie manager tie effect changes when we introduce occupation, a finding which is robust across Tables 2 and 3: without occupation the manager tie effect is prevalent, but controlling for occupation the manager tie effect disappears (in Table 2 it is reduced, yet disappears with the addition of the interaction terms). The observed 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.[22] 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

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[21] In order to test for the joint significance of the interaction terms (manager tie and the different occupation categories) we carry out an F-test. The p-value of the test is 0.899, and thus we strongly reject the H_0 of joint significance.

[22] We run a multinomial logistic regression showing that the probability of working as a manager or a sales worker as compared to production worker increases when employed using a manager tie. Results are available upon request.

accounting for occupation. Hence, the manager tie effect works through occupation and disappears once this is controlled for. Figure 1 provides an illustration of this mechanism.

Table 3: Firm characteristics

Dependent variable: ln(real wage)	(1)	(2)	(3)	(4)	(5)
ln(employment)	0.072***	0.031*	0.041**	0.030*	0.029*
	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)
Professional worker share	0.957***	0.468*	0.451*	0.393	0.370
	(0.264)	(0.248)	(0.246)	(0.246)	(0.248)
Female share	-0.347***	-0.231***	-0.226***	-0.259***	-0.261***
	(0.083)	(0.084)	(0.084)	(0.081)	(0.081)
ln(average real other labour costs)	0.031***	0.017*	0.015*	0.018**	0.019**
	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)
Occupation:					
Manager = 1				0.474***	0.425***
				(0.056)	(0.079)
Professional worker = 1				0.180***	0.139*
				(0.062)	(0.074)
Office worker = 1				0.094*	0.111
				(0.055)	(0.077)
Sales worker = 1				0.211***	0.221***
				(0.044)	(0.065)
Service worker = 1				-0.059	-0.000
				(0.046)	(0.060)
Recruitment ties:					
Manager tie = 1			0.092***	0.046	0.032
			(0.035)	(0.031)	(0.037)
Worker tie = 1			0.044	0.056*	0.063*
			(0.031)	(0.030)	(0.038)
Ties * Occupation	NO	NO	NO	NO	YES
Sector dummies	YES	YES	YES	YES	YES
Province dummies	YES	YES	YES	YES	YES
Employee characteristics	NO	YES	YES	YES	YES
R-squared	0.227	0.396	0.404	0.485	0.491
Observations	753	753	753	753	753

Note: Dependent variable: (log) real wage. 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.. ***, **, * indicate significance at a 1, 5, and 10 pct. level, respectively.
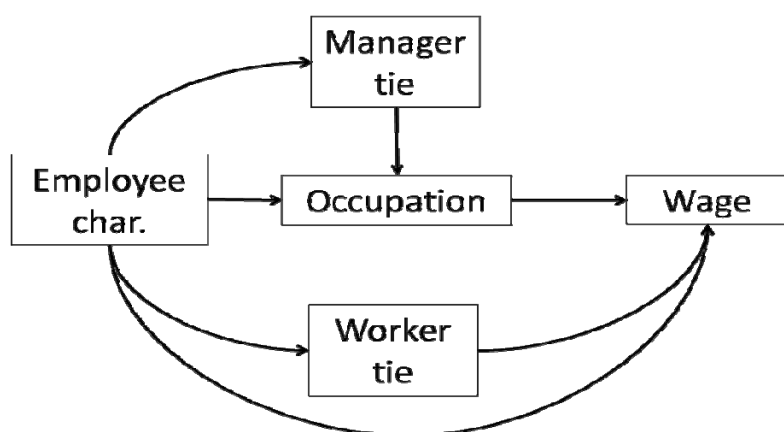
Figure 1: How ties affect wages

This result can be interpreted in different ways. First, 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. Second, when the worker has a personal relation to the manager he/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 job positions. By contrast, as illustrated in figure 1, the worker tie effect works *within* occupation. As reported in Table 4 only 10.5 pct. of the managers are recruited through a tie to another worker in the firm, providing an explanation for why the worker tie effect is insignificant when occupation is not accounted for in Table 3.[23] The fact that managers earn higher wages, yet do not generally use worker ties counteracts the worker tie wage premium. However, when controlling for occupation we find weak evidence of a worker tie wage premium, which could be interpreted in the following ways. First, 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. Second, 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, the worker tie effect does not work through occupation, which is not surprising given that a co-worker in the same occupation category (e.g. a production worker) is unlikely to be able to refer another worker to a higher paid job position. 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

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[23] Estimates from a multinomial logistic regression show that the probability of being employed in a manager position through a worker tie is significantly lower (at a 10 pct. level) than being employed as a production worker. Other occupational categories are insignificant. . Results are available upon request.

increase the chance of being employed in a highly paid job position. In fact, managers who receive the highest wage premiums are also those that are least likely to have been hired through a worker tie.[24] Overall, our results are consistent with the general literature (as reviewed in section two) that using informal contacts are positively associated with wage levels.

Table 4: Recruitment method for selected variables

	Recruitment method (%)		
	manager tie = 1	worker tie = 1	formal channels = 1
Full sample	**33.9**	**23.5**	**42.6**
Occupation:			
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
Location:			
Urban provinces	34.8	26.6	38.6
Rural provinces	32.8	19.9	47.3

6. Sensitivity analysis

Occupation

To further investigate how 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 3 on the two subsamples. Results are presented in Table 5 Panel A, and the results in Tables 2 and 3 are largely supported. Production workers who are recruited through recommendation by another co-worker obtain a wage premium of close to 8 pct. whereas, the manager tie effect is insignificant. Among non-production workers – not controlling for their occupation – the manager tie effect is significant indicating that a worker who uses a manager tie receives a wage premium of 14 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.

Location

We split our sample into rural and urban provinces using the specifications from Table 3, columns (3) and (4), to see how the tie effects differ between rural and urban firms. Results are presented in

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[24] Result from a multinomial logistic regression. Results are available upon request.

Table 5 Panel B. We find that the worker tie is significant at a 5 pct. level in both the rural and urban subsample, yet for the latter only at a 10 pct level when occupation is not controlled for. As for the manager tie, among the urban enterprises we find a stronger positive correlation than in the full sample, and it survives the introduction of occupation categories. The fact that we find manager tie effects to be more predominant among urban enterprises suggests that owner-manager personal relations and favouritism is more prevalent in the urban SMEs under study.

Table 5: Occupation and Location splits

	Panel A: Occupation			
	(1)		(2)	
	Production worker		Non-production worker	
Recruitment ties:				
Manager tie = 1	0.007		0.139**	
	(0.038)		(0.059)	
Worker tie = 1	0.077**		0.028	
	(0.038)		(0.054)	
Firm characteristics	YES		YES	
Employee characteristics	YES		YES	
R-squared	0.334		0.389	
Observations	392		361	
	Panel B: Location			
	(1)	(2)	(3)	(4)
	Rural	Urban	Rural	Urban
Recruitment ties:				
Manager tie = 1	0.026	0.158***	-0.020	0.109**
	(0.050)	(0.049)	(0.043)	(0.042)
Worker tie = 1	0.081**	0.075*	0.081**	0.093**
	(0.041)	(0.044)	(0.038)	(0.043)
Occupation	NO	NO	YES	YES
Firm characteristics	YES	YES	YES	YES
Employee characteristics	YES	YES	YES	YES
R-squared	0.411	0.443	0.503	0.525
Observations	351	402	351	402

Note: Dependent variable: (log) real wage. 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 Tables 3 and 4 (column 1), respectively. ***, **, * indicate significance at a 1, 5, and 10 pct. level, respectively.

Firm size

In Table 6 we divide the sample into micro, small and medium scale enterprises, and redo the regressions corresponding to columns (3), (4) and (5) in Table 3. The results show that the manager tie effect is prevalent *only* among small scale enterprises (at a 10 pct. level). The worker tie is significant in medium firms only, even when not controlling for occupation (yet, not when

interaction terms are included). The generally lower levels of significance may be due to the relatively small number of observations in each split in proportion to the number of covariates.

Table 6: Firm size splits

	Excluding occupation			Including occupation			Including occupation*ties		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Micro	Small	Medium	Micro	Small	Medium	Micro	Small	Medium
Recruitment ties:									
Manager tie = 1	0.035	0.115*	0.069	0.013	0.069	0.053	-0.035	0.137*	-0.058
	(0.045)	(0.060)	(0.122)	(0.041)	(0.056)	(0.082)	(0.044)	(0.079)	(0.098)
Worker tie = 1	0.038	-0.052	0.138*	0.059	-0.023	0.142*	0.030	0.075	0.029
	(0.050)	(0.051)	(0.079)	(0.048)	(0.050)	(0.075)	(0.051)	(0.074)	(0.109)
Occupation	NO	NO	NO	YES	YES	YES	YES	YES	YES
Ties * Occupation	NO	NO	NO	NO	NO	NO	YES	YES	YES
Firm characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES
Employee characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	0.395	0.530	0.687	0.459	0.585	0.806	0.476	0.597	0.835
Observations	326	306	121	326	306	121	326	306	121

Note: Dependent variable: (log) real wage. 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. ***, **, * indicate significance at a 1, 5, and 10 pct. level, respectively.

In summary, 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 splitting the data into sub-samples, it is revealed that these results are driven mostly by non-production workers in urban and small scale firms. The positive worker tie wage premium, however, holds with the inclusion of occupation categories, and is generally stronger in rural and medium enterprises, especially among production workers.

7. 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.

With regard to recruitment ties, we find evidence of a positive wage premium for a worker who is hired through an informal contact to a manager or a worker in the firm, 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, whereas within the same occupation there is no significant wage difference compared with having been recruited through a formal channel. The positive manager tie wage premium can be interpreted in different ways: The fact that the manager knows the job applicant may induce him/her to hire the applicant into a management position because he/she has private knowledge about the applicants' managerial skills or simply due to favouritism. An alternative interpretation could be that the job applicant through contact to the manager has bargaining power to be employed in a higher paid job position. 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. The positive worker tie premium could be an indication of access to information which puts the job applicant in a better bargaining position, or it could be due to workers hired through a worker tie having larger networks and thus optimizing over many job offers.

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Appendix

The wage data from the employee survey was "cleaned" with two objectives in mind: First, to remove any measurement errors such as typos or mistaken wage units and second, to eliminate large outliers so that the estimation results were not driven by single observations. In this process, several inconsistencies in the specification of the wage time unit were discovered. First, four workers had indicated an hourly wage time unit while the wage specified corresponded more to a monthly wage, thus we chose to drop these four observations. Moreover, 14 production workers had stated a daily wage time unit, yet when their wage was converted into a monthly wage they earned more than 9 million VND, which is substantially above the highest production worker wage. We changed their wage time unit into "monthly" which resulted in reasonable wages around the sample median of 1.2 million VND corresponding with the wages of co-workers in the same firm. We converted wages into a monthly equivalent using the sample means of 6 work days per week and 8 work hours per day, yet we did not correct the wages of workers who reported 7 work days since full-time workers have a legal entitlement to one day off per week (Lee and Eyraud, 2008).

We further "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 million VND and management board members receive a minimum of 2.5 million VND. In our sample, non-manager and non-professional observations with wages outside of this range were scrutinized taking several variables into account. First, we checked the correspondence of the reported wage with the wages of other workers in the firm. Second, we compared the employee wage with the average wage in the firm, computed from the enterprise data on total wage bill and number of full-time employees. The ownership type and province of the firm were also considered together with the job function, gender and educational level of the employee. Observations that are clearly unreasonable were dropped from the sample. Documentation on the dropped observations can be obtained upon request.