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"Whom you know" and Labour Market Outcomes: An Empirical Investigation in Ghana

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Abstract

The relevance of social networks sometimes referred to in Ghana as "whom you know" in the job acquisition process and its effect on labour market outcomes (wages, job satisfaction and job tenure) have been highlighted by a number of studies. Most of these studies have concentrated largely on monetary post-hire outcomes with limited research on non-pecuniary aspects. Using a cox proportional hazard model to analyse a survey of 150 formal sector workers in the services sector in Accra, the study observes that first, jobs acquired through the help of workers' friends and relatives did not last long. The first jobs could be a stepping-stone for better jobs. This effect is however not statistically significant after controlling for individual and firm-level covariates. Conclusions are however made with caution due to the small sample size and the nature of respondents' majority of whom are highly educated and relatively younger. Future research can explore further social networks and labour markets particularly in Africa where familiarity and identical ethnic bonds are visible and stronger.

Keywords: *Social networks; Job tenure; Cox proportional hazard model.*

JEL Classification: *J6*

1. Introduction

It has been widely argued and proven that the type of job search method used by workers can speedily facilitate their transition from unemployment to employment and enhance labour market outcomes, particularly, wages and job quality. Owing to the important role social ties play in the labour market, many studies have examined the efficacy of workers resorting to help from friends and relatives in securing jobs and post-hire outcomes across both economic and sociological spectrums.

The search for jobs has been broadly dichotomized into formal and informal means. According to Rees (1966), the formal means of job search include search through publicly available channels such as newspaper advertisements, unsolicited direct application to employers and employment agencies. In recent times the internet has become a new addition. Informal method of search, on the other hand, entails search and acquisition of job-related information through friends, relatives and acquaintances of individuals. It has been empirically observed that workers receive and accept more offers through their social networks as against more formal channels (Blau and Robins, 1990 and Holzer, 1988). The frequent use of social ties may be due to the lower cost associated with its usage. This mode of job attainment is seen to be cheaper as the investment required workers to rely on social networks already in place, much lower compared to formal methods which can only be effectively utilized through continual investment (Granovetter, 2005).

Theoretical literature, however, differs on the monetary returns to jobs gained through the help of workers' informal contacts. Some hypothesise that using this medium helps to generate offers that comes with a wage premium (Mortensen and Vishwanath 1994). Others theorise that a wage penalty may result from the use of such a medium (Franzen and Hangartner 2006). In the same vein, the empirical literature has shown that workers usage of social ties does not only help to generate job offers faster (Pistaferri, 1999), but can match them to high paying jobs (Yogo, 2011, Loury, 2006 and Granovetter, 1973). These outcomes, however, vary depending on the prevailing labour market in a country. Pellizari (2010) found that wage premiums and penalties are equally likely across countries and industries. In contrast, some studies report that jobs attained through the pioneering role of workers' social ties are associated with a lower wage (Beggs and Hurlbert, 1997, Mencken and Winfred, 2000). Reasons ascribed for this negative relationship are that it is possible that workers who acquired jobs through the help of friends and relatives may not qualify for high-paying jobs through formal channels and also are more likely to be those who do not search intensively for jobs.

Evidently, social networks' role in the labour market is phenomenal butt little evidence exist for the relationship between the resort to informal networks and job tenure. Many uncertainties surround an unfilled job vacancy as there exist

information asymmetry on the part of both workers and employers with regard to the nature of the job in question and the productivity attributes of the worker to be hired subsequently. Workers who have social ties in organizations in which they are seeking for employment offers can reduce the level of uncertainties making it possible for a good match to be produced. When such a match is made, the employment relationship can be long-lasting. Both theoretical and empirical literature (Datcher, 1983, Simon and Warner, 1992, Loury, 2006, Nakajima, Tamura and Hanaki, 2010) have supported this assertion. The empirical studies claim that jobs obtained through workers' social networks as against more formal channels last longer. This can be attributed to the information advantage enjoyed by these workers together with integration roles played by workers' informal contacts. According to Fernandez, Castilla and Moore (2000), informal networks can aid new entrants' assimilation into organisations through informal training and mentoring. This link may be inconclusive as Neckerman and Fernandez (2003) in a study on hiring through referrals and turnover saw no significant difference in turnover between network-induced hires and non-referred workers.

The lack of reliable labour surveys in most developing countries, particularly in sub-Saharan Africa (SSA), has skewed research on the relationship between social network usage and wage (and non-wage) labour market outcomes to the developed world (Simon and Warner, 1992 Loury, 2006, Franzen and Hangartner 2006). Even though some studies in Africa considered wages and non-monetary outcomes such as job quality (Naidoo, 2014, Yogo, 2011, Mano, Yamono, Suzuki, 2011), to the best of our knowledge, no known study has considered how social networks relates to job tenure. Closely related to this study is a work conducted by Fafchamps and Moradi (2015). Using data from the British colonial army for the period, 1908–23, their study found that military job matches through referrals did not result in recruiting workers who were more efficient or fit for tasks. The labour market in Ghana since the colonial era however has undergone significant changes. This study relates to the strands of literature in various ways. It adds to the existing scant literature on informal networks and employment tenure. The study is also the first attempt to examine the link between job search and job tenure from a Sub-Saharan African perspective. As such, it seeks to fill this dearth and provide a foundation for further research on social networks and post-hire outcomes in developing countries.

Though the importance of social networks cannot be spurred by policy intervention, it will be worthwhile to know that aside from the earning differentials between ethnic groups as observed by Barr and Oduro (2002) in the manufacturing sector in Ghana, whether referred jobs are better matches or otherwise. The paper basically seeks to consider if the search methods used by workers (informal versus formal methods) in obtaining jobs have any impact on job tenure. In addition, other determinants of job tenure (both individual and firm-level characteristics) on job tenure are considered.

The study adopts a cox proportional hazard model to analyse a survey of 150 formal sector workers employed in the services sector in Accra carried out in March and April, 2015.

This paper is structured into six sections. It began with an introduction and the next section presents an overview of the labour market with an emphasis on job search and tenure in Ghana. Section three discusses the theoretical model utilised after which a description of the dataset, estimation procedure and discussion of the empirical results are done. The final section summarise the findings and concludes.

2. The Labour Market in Ghana

2.1. Brief overview

Available labour market indicators suggest that the market is dominated by informal activities with only 12% of labour market activities classified as formal. The Ghanaian economy has witnessed remarkable growth performance over the last decade but this has not reflected in the generation of sufficient and quality jobs for the rising labour force (see Baah-Boateng, 2016 and 2017). One noticeable change in the labour market over the last decade has been a shift from agricultural dominance in employment to service, which mirrors the changing structure of the entire economy. Employment in agriculture declined from about 55% in 2006 to 36% in 2015 while the services share increased from 31% to 46% over the same period. Self-employment, particularly own account work is highly pervasive accounting for about three-quarters of total employment compared with a little over one-fifth in wage employment.

Unemployment remains a challenge rising from 4.6% in 2006 to 6.5% in 2015 among adults aged 15+. The rate is higher among the youth (aged 15–24) ranging between 9.5% in 2006 and 14.4% in 2015[1]. The rates are higher among the educated than uneducated and in urban areas than among rural folks (see Baah-Boateng, 2013, 2015). This observation has been partly blamed on the mismatch between skill sets desired by employers and industries and those possessed by graduates (Boateng and Ofori-Sarpong, 2002, Bawakyillenuo *et al*., 2013). With limited jobs in the formal sector, the main destination for educated workforce coupled with higher unemployment, competition for jobs in this sector is likely to be keener.

2.2. Job search among unemployed workers

Table 1 presents the job search behaviour of the unemployed in Ghana, extracted from the GLSS 6 report. From the table it can be observed that unemployed people resorted mostly to asking friends and relatives (43.3%) in their search for jobs followed by direct application to prospective employers (25.5%). Newspaper

[1] *Unemployment figures were computed by Authors from the GLSS V of 2005/06 and Labour Force Survey of 2015.*

advertisement and Internet search processes are the least favoured channels used by job seekers in Ghana. About 0.7% of job seekers utilised the Internet whereas to 0.2% inquired about jobs through newspaper advertisements.

Table 1: Job search by individuals (15 years and above) looking for work

Search Process	Male	Female	Total
Direct application to prospective employer	34.2	18.8	25.5
Checking at Farm gates/ Factory Visits	9.5	4.8	6.8
Asking friends and relatives	38.8	46.7	43.3
Newspaper Advertisements	0.2	0.3	0.2
Internet searching	1.4	0.3	0.7
Employment Agencies/ Services	2.3	2.4	2.4
Total	100.0	100.0	100.0

Source: *Ghana Living Standards Survey VI (GSS, 2014)*

Gender difference in the job search method adopted by job seekers is pervasive in the three top channels of job search. A higher proportion of women than men relied on friends and relatives in their job search activities, while the reverse is the case when it comes to direct application to prospective employers and checking at farm gates or factory visits. A considerably higher proportion of men than women resorted to internet searching as a means of searching for jobs. No significant gender differences in job search activities is found with the use of employment agencies/ services and newspaper advertisements.

2.3. Job tenure in Ghana

Job tenure is measured by the length of time an employee spends on a job between the time he or she is employed and the time he or she leaves the job voluntarily or involuntarily. It also reflects invariantly the length of time a worker has been with an employer. Job tenure is one indicator used by employers in their hiring endeavours and influences the success of job search of jobseekers. Table 2 presents the average job tenure of workers in different occupations and by gender based on the GLSS VI dataset of 2012/13. Overall, men are found to have longer job tenure than females. Managers are observed to have longer tenure (almost 11 years) with male managers having a longer tenure than their female counterparts. Technicians and associate professionals is the occupation with the second-longest average (10.13 years) job tenure followed by professionals (9.79 years) and in both occupations, females have

longer job tenure than males. Skills agricultural workers and plant and machinery operators and assemblers follow closely with average job tenure of at least 9 years with gender differences favouring males. Job tenure is shortest among service and sales workers with an average of 5.57 years followed by elementary occupations (5.89 years) and craft and related trade workers (7.91 years) all of which have shorter job tenure for females than males.

Table 2: Tenure of workers by occupation and gender (in years)

Occupational type	Male	Female	Total
Managers	11.57	7.57	10.65
Professionals	9.57	10.14	9.79
Technicians and associate professionals	10.05	10.34	10.13
Clerical support activities	8.73	7.22	8.06
Service and sales workers	6.86	4.23	5.57
Skilled agricultural, forestry and fishery workers	10.43	5.27	9.77
Craft and related trades workers	8.34	5.93	7.91
Plant and machine operators and assemblers	9.21	6.19	9.12
Elementary occupations	6.60	4.53	5.89
Total	8.72	6.85	8.14

Number of observations: 5,217
Some occupations were omitted and figures in the table are averages
Source: *Authors' Computation using GLSS VI dataset*

Table 3 presents average job tenure across major industry or economic sector by gender. It shows longest job tenure for workers in public administration and defence (12.05 years) followed by education (9.82 years), the two of which are public sector dominated industry noted for high job stability and security. Agriculture (9.46 years), professional, scientific and technical activities (9.27 years) and construction (8.43 years) follow closely with considerable longer job tenure. Shorter job tenure is reported for workers in information and communication (5.35 years), wholesale and retail trade (5.43 years), financial and insurance activities (5.71 years). Job tenure is longer for male workers than their female counterparts across all the 11 major industries or economic sectors. Wider gender differences are observed in construction and agriculture-related issues.

Table 3: Job tenure by industry

Type of Industry	Male	Female	Total
Agriculture, forestry and fishing	10.07	6.39	9.46
Mining and quarrying	6.28	4.76	6.05
Manufacturing	7.60	5.22	6.77
Construction	8.52	3.53	8.43
Wholesale and retail; repair of motor vehicles and cycles	6.76	3.63	5.43
Information and communication	5.59	4.52	5.35
Financial and insurance activities	6.32	4.78	5.71
Professional, scientific and technical activities	9.98	6.83	9.27
Administrative and support service activities	7.30	7.06	7.22
Public administration and Defence	12.89	9.44	12.05
Education	10.10	9.41	9.82

Number of observations: 5,216
Not all industries are included in the table.
Source: *Authors' Computation using GLSS VI dataset*

3. Theoretical Framework

We adopt an extended job-matching model developed by Simon and Warner (1992), which is an augmented version of the job matching process formulated by Jovanovic (1984). Essentially, a worker searches for jobs and accepts the offer with a value that is as large as his minimum acceptance wage. Additionally, an employer can only produce an offer when returns from doing so are maximized (Pissarides, 2000). Thus for a match to be made between a worker and an employer, the gains from accepting an offer and that emanating from the vacancy creation must coincide.

Within a competitive labour market framework, a profit-maximizing firm operates such that the value of the marginal productivity of an additional hand hired is equal to the wage offered. However, the productivity traits of a potential worker cannot be ascertained due to information asymmetry regardless of the rigorous screening methods used in the recruitment process. Some desirable attributes of a worker which include enthusiasm and other work-related skills that may be difficult to assess in an interview can be made known by friends and relatives who know the prospective worker personally (Saloner, 1985).

With the extended job matching process developed by Simon and Warner (1992), for an unemployed worker, the value of an initial offer, say ϕ, (Λ(ϕ)) is

$$\Lambda(\phi) = max\{\eta + \beta EJ(\psi), \beta q\} \quad (1)$$

where η is the individual's value of an initial job offer; β represents the discount factor; ψ denotes the value of accepted job offer; and $\beta EJ(\psi)$ is the discounted expected present value of an employee remaining with a matched employer whiles the present value of a worker remaining unemployed is given as βq.

Offers are received from both formal (*M offers*) and informal sources (*INF offers*). With actual productivities of a worker (ψ) unraveled through the help of friends and relatives, the noise associated with informal-networked offers is less than those formally engineered. If $\sigma\epsilon$ is the standard deviation of the noise that comes with the observed productivity of a worker prior to being hired, then $\sigma\epsilon^2$(*INF offers*) < $\sigma\epsilon^2$(*M offers*). It is further shown that the probability of a worker leaving a job after the hiring period is

$$\int_{-\infty}^{\psi} dG(\psi \mid \sigma_\epsilon^2) = \gamma\left(\frac{\psi^r - \phi}{\sigma_\epsilon}\right) \quad (2)$$

$\gamma(.)$ is a cumulative distribution function; and ψ^r denotes the reservation wage of the accepted job offer. The likelihood of a worker leaving a job is an increasing function of $\sigma\epsilon^2$. Due to the relation that $\sigma\epsilon$ (*INF offers*) < $\sigma\epsilon$ (*M offers*), workers who obtain jobs through informal networks are less likely to leave. But the decision to leave a job also depends on firm and individual-level characteristics.

4. Data Source

With no longitudinal data available on job search and labour market outcomes in Ghana, a survey conducted through retrospective helps us to analyse social network usage and job tenure. To this end, a primary survey of 156 formal sector workers employed in the services sector in Accra, Ghana's capital is the data used for analysis in this study. This sector was the focus of the survey on account of the strong growth witnessed over the last decade culminating in the shift from the agricultural sector dominance to services in the Ghanaian economy. The questionnaire administered in the survey contained questions that solicited information on which method of the search was instrumental in the acquisition of workers previous and current jobs if they have held more than one job since they started work. Job tenure was estimated using the response given to how long workers had worked/been working for their first employer. Additionally, information was sought on socioeconomic characteristics of workers and features of the employers they are/were engaged with.

A two-stage sampling technique was used in the collection of the data. In the first stage, thirty firms were selected from four subsectors of the services

sector: telecommunications, banking, public service and educational institutions (universities). This sample gave equal representation to all the subsectors and comprised workers in both the public and private sectors. Private sector firms from which workers were drawn are in the top 10 within their specific industries. For the second stage, ten questionnaires were administered randomly to ten workers in each firm selected earlier. Even though a calculated sample size of 384 is appropriate for relatively large population to achieve precision, the total number of workers contacted, 300, is appropriate were employed in the four subsectors of the services sector in Ghana's capital, Accra at the time of collection of data and had been with their first employer from the year 2000 onwards. Two hundred and five of the answered questionnaires were retrieved. After accounting for missing variables and dropping data of respondents who have held more than two jobs[2] since they started work, one hundred and fifty-six (156) remained useful for further analysis. Survey instrument captured the duration of stay of workers with current and previous employers if they have worked for more than one employer.

Search methods used to estimate the effect of informal contacts on job tenure was categorised into formal and informal channels. The classification was based on the descriptions of groupings by Rees (1966). Table 4 presents a summary of the descriptive statistics of respondents. About 42% of the respondents are females as against males of 58%. The average age of the workers sampled is 31 years with the youngest and oldest being 23 and 50 years respectively. Slightly more than half (57%) of the sampled workers are Akans and the remaining 43% are from other ethnic orientations. About one-third of respondents (34%) are married while two-thirds are unmarried.

Most of the respondents have tertiary education with about 59% having at least a diploma or bachelor's degree and 38% possess a postgraduate degree. However, business and related disciplines graduates dominate (44%). Table 5 also reports that a higher percentage of respondents are engaged in the private sector (61%) with the public sector accounting for the remaining 39%. With regard to the number of job search methods used, on average, workers use two methods in seeking jobs and the mean number of years they have been with their first employer was four years.

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2. *Questionnaires administered could only capture information on only two employers workers has been engaged with. Empirical estimation was restricted to the first jobs held since information on the first jobs of respondents who had worked for more than two employers since they started working could not be obtained.*

Table 4: Descriptive statistics of sampled workers

VARIABLES	Obs	Mean	Std. Dev.	Min	Max
Female dummy (Female 1; Male 0)	156	0.423	0.496	0	1
Age (in years)	156	31.65	5.708	23	50
Akan dummy (Akan 1: others 0)	156	0.571	0.497	0	1
Married dummy (Married 1: Single 0)	156	0.34	0.475	0	1
Private Sector dummy (Private 1; Public 0)	156	0.615	0.488	0	1
Diploma/Bachelors (Bachelors 1; other 0)	156	0.59	0.493	0	1
Masters/Postgraduate (Masters 1: other 0)	156	0.378	0.487	0	1
Business Administration (Bus. 1; other 0)	156	0.442	0.498	0	1
Number of search methods used	156	2.147	1.217	1	6
Job tenure (first job)	156	4.138	3.288	0.25	15.33

Source: *Authors' Computation based on Survey data*

The study placed much emphasis on the gender of the person that helped to secure first jobs for workers and this is reported in Table 5. Table 5 reports on the search strategy that aided in workers obtaining their first jobs. A higher percentage of the respondents (45.5%) found a job through a relative or friend (i.e. female or male contacts engaged with an employer or has some form of relationship with an employer. Direct application to the employer is the second most important medium through which workers obtained jobs (28.9%). Only 16.0% of workers had their jobs through advertisements in newspapers, radio or the internet. Almost one out of ten workers had their jobs through other methods (mainly employment agencies).

The gender dimension of job search method adopted indicates that an equal proportion of males (45.55%) and females (45.46%) obtained their first jobs with the help of relatives and friends. A further breakdown indicates that a higher proportion of females than males used female contacts engaged with an employer or not employed by the firm. Similarly, a higher proportion of males than females secured their first job through male contacts. Thus, workers had a lot of help from contacts of the same sex as them but overall male contacts were more helpful. A higher proportion of females than males relied solely on newspaper/radio/internet. In terms of direct application, males were better off resorting to that medium.

Table 5: Job search method that helped[3] workers to obtain first job

Method	Male	Female	Total
Newspaper/Radio/Internet	13.33	19.70	16.03
Female Contacts engaged with employer	6.67	18.18	11.54
Male Contacts engaged with employer	21.11	12.12	17.31
Female contacts not employed by the firm	4.44	7.58	5.77
Male contacts not employed by employer	13.33	7.58	10.90
Direct Application	33.33	22.73	28.85
Others	7.78	12.12	9.62
Total (%)	100.00	100.00	100.00

Number of observations: 156

Source: *Computations based on Authors' Survey*

5. Estimation Procedure

In order to estimate the effect of social network usage (vis-à-vis its formal methods) on job tenure, we make use of duration analysis. Duration analysis is mostly utilized in panel data analysis but can also be applied to survey data with a recall dimension (Jenkins, 2005). The study adopts the Cox proportional hazard model that was also used by Loury (2006) in a similar study and is specified as

$$h_i(t) = h_0(t)\exp\,(X_i\beta) \tag{3}$$

From (3), for worker *i*, $h_0\,(t)$ is a baseline hazard and the *Xi* is a row vector of explanatory variables with β being a column vector of regression coefficients. The analysis in this paper relates only to the first job of workers sampled, thus $h_i\,(t)$ is the density function indicating the probability of a worker, *i*, leaving his first job at time *t* given that he has stayed on that job till that time.

Since data generated by this study is not continuous, we adopt a discrete proportional hazard function specified as

$$h_i(t) = 1 - \exp\left[-\exp\,(\varrho_t + \beta' X_{it})\right]^4 \tag{4}$$

Cox proportional hazard model is selected over other specifications (Weibull, Gompertz and Exponential) as it has an advantage of producing results (estimations

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3. *Search method which helped workers secure first jobs indicated here reflects the most important means through which workers obtained valuable information about job availability and firms. If an informal contact is what generated a match, then there is evidence of a worker's social tie within or outside the firm playing a role. The analysis reported does not ignore the possibility that two or more methods could be used simultaneously by a worker.*

4. *The discrete time proportional hazard function was generated by Holford (1976) and Prentice and Gloecker (1978). Allison (1982) showed that the β parameters, a column vector of coefficients specified in (4) is the same for (3).*

of the βs) that are not misleading if the assumptions surrounding the baseline hazard are wrong (Cleves *et al*., 2010). In addition, the effects of predictors on outcomes (likelihood of leaving a job) can be easily determined using the Cox model (Meyer, 1990).

Table 6 presents the list of variables and how they are measured in the estimation of the model. The outcome variable, job tenure, is measured by the number of years spent on the first job. The key covariates are social network, female contacts, and male contacts all of which take on discrete values. The other individual and firm-specific variables controlled for are the age of the worker measured in years, female dummy, married dummy, satisfaction rating dummy, training dummy, union dummy and institutional sector dummy.

Table 6: Description of variables used for empirical estimation

Variable	Description and Measurement
Social Network	Dummy: 1 if the respondent obtained job through a friend or relative; 0 otherwise
Female contact	Dummy: 1 if worker secured job with the help of a female social tie; 0 otherwise
Male contact	Dummy: 1 if respondent had job through a male friend/relative; 0 otherwise
Age	Age (in years) of the respondent
Female	Female dummy: 1 female worker; 0 male worker
Married	Married dummy: 1 married workers; 0 unmarried
Satisfaction	Dummy of Satisfaction rating : 1 satisfied; 0 not satisfied
Training	Dummy: 1 training provided by employer; 0 no training given
Union	Dummy: 1 trade union availability at workplace; 0 no trade union available
Private sector	Dummy variable for institutional sector: 1 Private sector; 0 Public sector
Job tenure	Number of years spent on the first job sector

Source: *Computations based on Authors' Survey*

6. Discussion of Empirical Results

The effect of social network in the job matching process on job tenure is analysed with the use of event-to-history methodology stated earlier. Two econometric estimations are undertaken from the analysis of survey data. First, we report the results of the effect of informal contacts usage on job tenure. Furthermore, a discussion on the effect of resorting to female and male contacts as against formal methods is made. This gendered-impact of contact is informed by a theory postulated and empirically tested by Loury (2006). In that analysis, female informal contacts are considered to be low-wage contacts and male social ties constitute high-wage contacts. This difference is more plausible as Baah-Boateng (2012) has observed that women earn less than men in the Ghanaian labour market.

We begin the discussion of the results with diagnostic checks to evaluate the predictive power and the overall fit of the models used for the discussions in this section. First, the test for predicted power is done using the Harrel's C concordance statistic (Harrell, Lee and Mark, 1996). Harrell's C statistic is computed in this study to assess whether the models have good abilities to discriminate between pairs of shorter-tenured workers and longer-tenured workers. From results obtained (captured in Appendix A and B), the models that account for workers' demographics and firm-level characteristics are able to do so 77-78% of the time. Secondly, the overall model fit is performed with the aid of Cox-Snell residuals (Cox and Snell, 1968). Figures I and II in the appendix show the graphs for this check and suggests that the model fits the data quite well. The jagged line in both cases is not too far from the reference 45^{o} line as the two graphs show.

The estimated effects of informal contacts on job tenure with controls not accounted for in coefficients are presented in columns (2) and (6) of Table 7. The associated effects in hazard ratios are in columns (3) and (7) respectively. Similarly, models 2 and 4 in columns (4) and (8) controls for workers' demographics and firm-level characteristics. Columns (5) and (9) provides hazard ratios for these models. Regardless of whether social networks are disaggregated into male and female contacts [(4), (5), (8), (9)] or subsumed to social networks [(2), (3), (6), (7)], the reference variable is formal channels. For ease of interpretation, hazard ratios sections are used for the discussions that follow. The results in column (3) indicate that jobs obtained through the help of workers' social networks are 70% more likely to have a shorter tenure than those acquired through more formal means. However, controlling for workers' demographics (gender, age, marital status, satisfaction ratings) and firm-level attributes (provision of training by employer, union availability and institutional sector) shown in (4) renders the effect of informal contacts on job tenure insignificant. Nonetheless, for a married worker and an employee engaged with a firm that embraces unionism, the likelihood of leaving their job reduces by 63% and 57% respectively. Thus, married workers and firms that embrace unionism are more likely to have longer job tenure.

The observation of the statistically insignificant effect of informal contacts on job tenure is not consistent with most studies (Simon and Warner, 1992, Loury, 2006 and Nakajima, Tamura and Hanaki, 2010) which saw that better job matches (longer tenure) are associated with jobs acquired through workers' informal networks. Though it confirms similar findings made by Neckerman and Fernandez (2003) which reported insignificant turnover between referred and non-referred workers in a retail bank, here, only voluntary severing of ties with an employer by a worker are examined. Reasons why jobs acquired via informal networks or formal methods might not impact job tenure could be a combination of the difficulty in getting jobs in the formal sector in Ghana and the use of the work experience obtained from

Table 7: Cox Proportional Hazard Model[5] : Job tenure and informal contacts

	Job Tenure (Voluntary Quits)							
VARIABLES	Coefficients (Model 1)	Hazard Ratios (Model 1)	Coefficients (Model 2)	Hazard Ratios (Model 2)	Coefficients (Model 3)	Hazard Ratios (Model 3)	Coefficients (Model 4)	Hazard Ratios (Model 4)
Social Network	0.530**	1.700**	0.237	1.267	---	---	---	---
(Ref: Formal)	(0.25)	---	(0.274)	---	---	---	---	---
Female Contact	---	---	---	---	0.833**	2.301**	1.092***	2.981***
(Ref: Formal)	---	---	---	---	(0.323)	---	(0.368)	---
Male Contact	---	---	---	---	0.377	1.457	-0.133	0.876
(Ref: Formal)	---	---	---	---	(0.282)	---	(0.31)	---
Age	---	---	0.0113	1.011	---	---	0.0222	1.022
	---	---	(0.0309)	---	---	---	(0.031)	---
Female dummy	---	---	0.202	1.224	---	---	-0.0738	0.929
	---	---	(0.264)	---	---	---	(0.289)	---
Married dummy	---	---	-0.977***	0.377***	---	---	-1.071***	0.343***
	---	---	(0.337)	---	---	---	(0.34)	---
Satisfaction dummy	---	---	-0.392	0.676	---	---	-0.233	0.792
	---	---	(0.268)	---	---	---	(0.278)	---
Training	---	---	-0.419	0.658	---	---	-0.483*	0.617*
	---	---	(0.271)	---	---	---	(0.277)	---
Union	---	---	-0.849**	0.428**	---	---	-1.090***	0.336***
	---	---	(0.344)	---	---	---	(0.349)	---
Private sector	---	---	0.519	1.68	---	---	0.526	1.693
	---	---	(0.342)	---	---	---	(0.341)	---
Observations	150	---	150 [6]	---	150	---	150	---
Chi-Square (χ^2)	4.56	---	52.16	---	6.36	---	61.38	---
Log likelihood	-287.32	---	-263.52	---	-286.417	---	-258.91	

Standard errors in parenthesis

Source: *Computations based on Authors' Survey data*

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6. *For ease of interpretation, the coefficients are expressed in hazard rates. 1%, 5% and 10% levels of significance are also represented as ***, ** and * respectively.*

6. *The number of observations used in the econometric model is 150 as against 156 which was used in Table 5. In the former case, 6 of the observations were removed as they had a disproportionate influence (outliers)*

first jobs by workers to access better jobs. Additionally, workers sampled for this study are highly-educated individuals who are more mobile due to the wide array of employment opportunities available to them. There could thus be a mix of rightly-matched and wrongly-matched jobs. The negative impact on job tenure occasioned by the reliance on social ties as reported in column (3) conforms to a study undertaken by Green (2012)[8] using an Australian dataset. Green's study reports a similar effect but has the coefficient of the informal contact predictor remaining significant after controlling for other covariates.

We now examine the effect when the gender of contact that aided in generating a job match is considered. The results, in column 9, suggest that jobs that are secured via female relatives and friends are about three times more likely to be shorter than those acquired through formal channels. Within the Ghanaian labour market, females earn relatively less than males across most broad occupations (Baah-Boateng, 2012), therefore, female contacts are not likely to be in a position to provide useful and potent connections to good jobs. Furthermore, most females (who generally have lower job tenure) from workers sampled obtained jobs through female social ties. Jobs that are secured with the aid of male contacts, on the other hand, have no significant effect on job tenure. Unlike Loury (2006), female contacts in this study provide no tenure advantage. In the gender-disaggregated model, (column 9), married workers stay with employers longer than unmarried cohorts. Married workers, in this case, are 66% less likely to leave a job. Jobs in firms that tolerate unionism have longer tenure. In firms with active and recognised employee association, the likelihood of a worker leaving a job is 34% of the rate associated with non-unionised employers.

7. Summary and Conclusion

Empirical literature both in economics and sociology abound on the role played by social networks in the job matching process and post-hire outcomes. Although many studies that have estimated the effect of informal contacts usage in the job search process focus on monetary post-hire labour market outcomes, this study tried to add to the scant literature on non-monetary outcomes. Using data on formal sector workers employed in the services sector in Ghana, the study provides evidence to suggest that, even though a higher proportion of workers had their first jobs through social networks (friends and relatives), such jobs did not last. Although we observed a statistically significant effect of the relationship between social network and job tenure, this effect loses significance once we include other covariates. This observation is at variant with job matching theories and most empirical studies

[8] *This effect was observed for jobs obtained by unemployed workers. In the same study, longer tenure was however found for new jobs obtained by employed workers who transited to them jobs via informal search channels.*

undertaken in this area. It could be attributed to the heterogeneity in the quality of informal contacts that workers used to obtain jobs. Likewise, the limited number of jobs available in the formal sector in Ghana makes it prudent for new entrants to use the first jobs as avenues for the acquisition of relevant experience. Thus, both good matches and bad matches are equally likely when jobs are obtained through social ties. Further analysis shows that jobs secured through female contacts are observed to have shorter tenure. Females are more likely to be lower earners, hence, may not be positioned well to provide connections to better job matches. This notwithstanding, our results should be interpreted with caution as the sample size is quite small and surveyed workers were sampled from four subsectors within the services sector. A much larger study is therefore needed.

More research is required on social network and labour market analysis in Ghana especially as to whether jobs acquired through informal contacts can contribute significantly to explaining wage differentials between workers. Inclusion of a question on the most important search method used by workers in acquiring jobs in a future labour market survey could help find an answer to some of the findings made here. In addition, studies can be undertaken on social resources in the Ghanaian labour market considering the strong external family bonds and ethnic identifiable groups even at institutions of higher learning.

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References

Allison, P.D. (1982). Discrete-time methods for the analysis of event Histories. *Sociological Methodology*, 13, pp. 6–98.

Baah-Boateng W. (2012). Labour Market Discrimination in Ghana: A Gender Dimension. LAMBERT Academic Publishing, Germany.

Baah-Boateng, W. (2013). Determinants of Unemployment in Ghana. *African Development Review*, 21 (4), pp. 383–399.

Baah-Boateng, W. (2015). Unemployment in Ghana: A Cross Sectional Analysis from Demand and Supply Perspectives. *African Journal of Economics and Management Studies*, 6(4), pp. 402–415.

Baah-Boateng, W. (2016). The youth unemployment challenge in Africa: What are the drivers? *The Economic and Labour Relations Review*, 27(4), pp. 413–431.

Baah-Boateng, W. (2017). Employment and labour market in Aryeetey, E and Kanbur, R. (eds.) The Economy of Ghana Sixty Years After Independence, Oxford University Press, New York, pp. 299–316.

Barr, A. and Oduro, A. (2002). Ethnic fractionalization in an African labour market. *Journal of Development Economics*, 68(2), pp. 355–379.

Bawakyillenuo, S., Akoto, I. O., Ahiadeke, C., Aryeetey, E. B. D. and Agbe, E. K. (2013). Tertiary Education and Industrial Development in Ghana. Policy Brief No. 33012, International Growth Centre (IGC), London.

Beggs, J. and Hurlbert, J. (1997).The social context of men's and women's job search ties: Membership in voluntary organizations, social resources, and job search outcomes. *Sociological Perspectives*, 40(4), pp. 601–622.

Blau, D. M. and Robins P. K. (1990). Job Search Outcomes for the Employed and Unemployed". *The Journal of Political Economy*, 98(3), pp. 637–655.

Boateng, K. and Ofori-Sarpong, E. (2002). An analytical study of the labour market for tertiary graduates in Ghana. World Bank/National Council for Tertiary Education and National Accreditation Board Project Report.

Cleves, M., Gutierrez, R.G., Gould, W. and Marchenko, Y.V. (2010). An Introduction to Survival Analysis Using Stata, Third Edition. Stata Press, Texas.

Cox, D.R. and Snell, E.J. (1968). A general definition of residuals (with discussion). Journal of the Royal Statistics Society, Series B (Methodological), pp. 248–275.

Datcher, L. (1983). The impact of informal networks on quit behavior. *Review of Economics and Statistics*, 65(3), pp. 491–495.

Fafchamps, M. and Moradi, A. (2015). Referral and Job Performance: Evidence from the Ghana Colonial Army. *Economic Development and Cultural Change*, 63(4), pp. 715–751.

Fernandez, R. M., Castilla, E. J. and Moore, P. (2000). Social Capital at Work: Networks and Employment at a Phone Center. *American Journal of Sociology*, 105(5), pp. 1288–1356.

Franzen, A., and Hangartner, D. (2006). Social Networks and Labour Market Outcomes: The Non-Monetary Benefits of Social Capital. *European Sociological Review*, 22(4), pp. 353–368.

Granovetter, M. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 78(6), pp. 1360–1380.

Granovetter, M. (2005). The Impact of Social Structure on Economic Outcomes. *Journal of Economic Perspectives*, 19(1), pp. 33–50.

Green, C. (2012). Employed and Unemployed job search methods: Australian evidence on search duration, wages and job stability. Working Paper, Lancaster University, Department of Economics, Lancaster. Available at http://www.eprints.lanc.ac.uk/72949/1/JSM_02.pdf (accessed on 4th March, 2016).

Harrell, F. E., Lee, K. L. and Mark, D. B. (1996). Multivariable prognostic models: issues in developing models, evaluating assumptions and adequacy, and measuring and reducing errors. *Statistics in Medicine*, 15(4), pp. 361–387.

Holford, T. R. (1976). Life tables with concomitant information. *Biometrics*, 32(3), pp. 587–597.

Holzer, H. J. (1988). Search methods used by unemployed youth. *Journal of Labor Economics*, 1(6), pp. 1–20.

Jenkins, S.P. (2005). Survival Analysis. An unpublished manuscript, Institute for Social and Economic Research. University of Essex. Available at: http://www.iser.essex.ac.uk/survivalanalysis (accessed on January 24, 2015).

Jovanovic, B. (1984). Matching, turnover, and unemployment. *The Journal of Political Economy*, 92(1), pp. 108–122.

Loury, L. D. (2006). Some Contacts Are More Equal than Others: Informal Networks, Job Tenure, and Wages. *Journal of Labor Economics*, 24(2), pp. 299–318.

Mano, Y., Yamano, T., Suzuki, A. and Matsumoto, T. (2011). Local and personal networks in employment and the development of labor markets: Evidence from the cut flower industry in Ethiopia. *World Development*, 39(10), pp. 1760–1770.

Mencken, F. C. and Winfield, I. (2000). Job search and sex segregation: Does sex of social contact matter? Sex Roles, 42(9–10), pp. 847–864.

Meyer, B. D. (1990).Unemployment insurance and unemployment spells. *Econometrica*, 58(4), pp. 757–782.

Mortensen, D. and Vishwanath, T. (1994). Personal contacts and earnings: It is who you know. *Labour Economics* 1(1), pp. 187–201.

Naidoo, D. (2014). Transitions to Adulthood: Education Choices, Job Search and Labour Market Outcomes. An Unpublished PhD. Thesis, Faculty of Agriculture and Environment, University of Sydney. Available at http://www.ses.library.edu.au/bistream/2123/10288/4/Naidoo,Darian-Thesis.pdf (accessed July 2 2015).

Nakajima, R., Tamura, R. and Hanaki, N. (2010). The effect of collaboration network on inventors' job match, productivity and tenure. *Labour economics*, 17(4), pp. 723–734.

Neckerman, K. M. and Fernandez, R. M. (2003). Keeping a job: Network hiring and turnover in a retail bank in Buskens, V, Raub and W. Snijders (eds) In The Governance of Relations in Markets and Organizations: Emerald Group Publishing Limited pp. 299–318.

Pellizzari, M. (2010). Do Friends and Relatives Really Help in Getting a Good Job? *Industrial and Labor Relations Review*, 63(3), pp. 494–510.

Pissarides, C. A. (2000). Equilibrium Unemployment Theory, Second Edition. MIT Press, Cambridge, Massachusetts.

Pistaferri, L. (1999). Informal Networks in the Italian Labor Market. *Giornale degli Economisti e Annali di Economia*, 58, pp. 355–376.

Prentice, R. and Gloeckler, L. (1978). Regression analysis of grouped survival data with application to breast cancer data. *Biometrics*, 34, pp. 57–67.

Rees, A. (1966). Information Networks in Labor Markets. *The American Economic Review*, 56(1/2), pp. 559–566.

Saloner, G. (1985). Old Boy Networks as Screening Mechanisms. *Journal of Labor Economics*, 3(3), pp. 255–267.

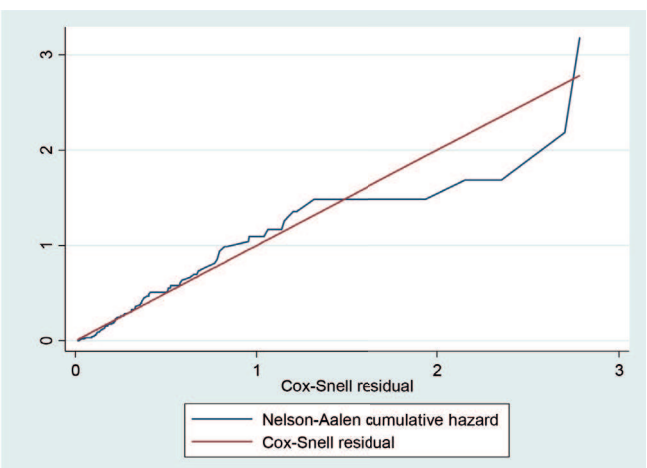
Simon, C., and Warner, J. (1992). Matchmaker, Matchmaker: The effect of old boy networks on job match quality, earnings, and tenure. *Journal of Labor Economics*, 10(3), pp. 306–330.

Yogo, U. T. (2011). Social Network and Wage: Evidence from Cameroon. *Review of Labour Economics and Industrial Relations*, 25(4), pp. 528–543.

APPENDICES

(A) Diagnostic checks for model specified in column (4) in Table 6

(i) Goodness of fit

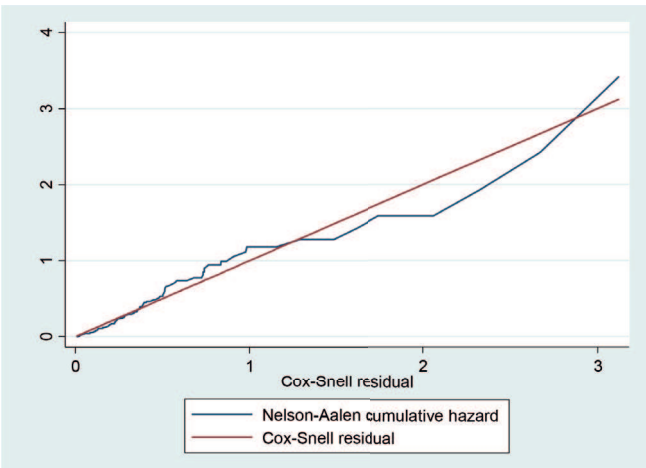


(ii) Harrell's C Concordance Test

Harrell's C concordance statistic		
Number of subjects (N)	=	150
Number of comparison pairs (P)	=	5871
Number of orderings as expected (E)	=	4511
Number of tied predictions (T)	=	4
Harrell's C = (E + T/2) / P	=	0.7687
Somers' D	=	0.5374

(B) Model diagnostic checks for specification in column (8) of Table 6

(i) Goodness of fit



(ii) Harrell's C Concordance Test

Harrell's C concordance statistic		
Number of subjects (N)	=	150
Number of comparison pairs (P)	=	5871
Number of orderings as expected (E)	=	4603
Number of tied predictions (T)	=	4
Harrell's C = (E + T/2) / P	=	0.7844
Somers' D	=	0.5687