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Ponzo, Michela and Scoppa, Vincenzo

Dipartimento di Economia e Statistica - Università della Calabria

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Michela Ponzo, Vincenzo Scoppa*

Abstract: A number of papers considers the use of informal networks (the help of relatives, friends and acquaintances) to find an employment as an efficient mechanism to match workers to jobs. However, evidence in Italy shows that informal networks tend to be used more in less productive jobs and less developed regions. We aim to show that informal networks – rather than being an efficient channel of information transmission – may interfere with a genuine process of selection of workers, favoring socially connected people in place of more talented workers. Using the Bank of Italy Survey on Household Income and Wealth (SHIW) we estimate with a Probit model the determinants of the probability of using informal networks. We find that informal networks tend to be used by low educated individuals, in low productivity jobs, in high unemployment areas, where opportunistic behavior are widespread and in jobs paying a wage rent. We offer a stripped-down model of nepotism to explain theoretically these findings.

Keywords: Informal Networks, Favoritism; Nepotism.

JEL classification: M510; D730; J240; J710; J310

1. Introduction

A large and growing evidence shows that workers find jobs mainly thanks to the help of relatives, friends and acquaintances (the so-called *social or informal networks*). In fact, in several OECD countries, many surveys report that around 50% of workers have obtained their job through informal networks and that firms use extensively employees' referral to fill job vacancies (Myers and Shultz, 1951; Rees and Shultz, 1970; Holzer, 1988; Granovetter, 1995; Corcoran *et al.*, 1980; Pistaferri, 1999).

A number of theoretical explanations has been offered to interpret the widespread use of informal networks, which emphasize the positive role played by these channels in terms of high quality job matching, better selection of workers and strong incentives to work hard for employees. One of the main explanations is that workers tend to be socially related to other individuals of comparable abilities and, as a consequence, firms find it convenient to follow referrals from their own high ability employees (Montgomery, 1991). Other mechanisms,

* Department of Economics and Statistics, University of Calabria, 87036 Arcavacata di Rende (CS), Italy. E-mail: michela.ponzo@unical.it; v.scoppa@unical.it. We would like to thank Francesco Aiello, Giuseppe Coco, Maria De Paola, Anna Giunta, Antonio Nicita, and seminar participants at the University of Bari and University of Calabria for useful comments and suggestions. The usual disclaimers apply.

considered in the literature, favoring the use of informal networks are: the importance of reputation of "signalers" and the possible consequences on their future career, the interest to have high ability co-workers if there is a team production in the firm, the peer-pressure which lowers monitoring costs (Rees, 1966; Saloner, 1985; De Paola and Scoppa, 2001; Kugler, 2003). Confirming these theoretically predictions, in US labor markets, researchers have often found that workers hired through informal networks are more productive (as measured by the perceived wage level) (Granovetter, 1995; Corcoran *et al.*, 1980).

However, in principle social relationships and family ties might interfere with a genuine process of selection, favoring socially connected people in place of more competent workers for the access to good jobs. Individuals belonging to the "old boy networks" may be preferred for reasons – such as loyalty, altruism, exchange of favors – unrelated to productivity. Goldberg (1982), reformulating Becker's theory of discrimination (Becker, 1971), has explained the preference of employers in hiring some particular categories of people, the so-called "positive discrimination". He coined the term "nepotism coefficient" to denote the increase in the employer's utility deriving from employing preferred workers. Furthermore, as we argue in a simple theoretical model, in an agency relationship favoritism can be shown not only by employers but also by employees when they try to help relatives or friends to acquire a job, satisfying their own interests.

In this paper, we consider this possible negative aspect related to social networks: they can be the channel through which low skilled but "connected" workers are selected, in place of more talented individuals, who lack informal ties.

The empirical evidence regarding the effects of informal networks on the quality of new employees for European countries is mixed. Several studies show that workers recruited through informal networks perceive lower wages in many European countries (Sylos Labini, 2006; Pistaferri, 1999; Pellizzari, 2004; Addison and Portugal, 2002; Bentolila, Michelacci and Suarez, 2004). These findings could represent the signal that informal networks do not always lead to an efficient job matching: connected workers could be selected as an exchange of favors or loyalty or mainly for "altruistic" reasons (individuals in charge of recruitment receive utility from the well-being of relatives or friends) and, as a consequence, individuals hired through informal networks might be characterized by lower productivity.

We aim to investigate these aspects more in depth. We analyze empirically the determinants of the use of informal networks to find a job in Italy, using the *Survey of Household Income and Wealth* (SHIW) conducted by the Bank of Italy in 2004 which contains information on the modalities followed by workers for the access to the labor market, as well as a wide variety of information on individual socio-demographic and economic characteristics.

In the econometric analysis we try to explain the factors determining the probability of using informal networks, estimating a Probit model. Since our aim is to verify if informal

networks hide favoritisms in recruitment, considered as opportunism in an agency relationship, we focus only on private employees, excluding self-employed (for whom no agency is established) and public sector employees – for whom the access to the job in Italy may formally take place only through a "public competition".

Our estimates show that the use of social networks is related to a number of factors which are in stark contrast with the "efficiency explanations": informal networks are used more frequently by low educated individuals, in small and low productivity firms, in less developed regions, in high unemployment labor markets, in jobs paying a wage rent. Our interpretation is that the use of informal channels represent the signal of favoritism activities followed in recruitment, as suggested in the work of Simon and Warner (1992).

We propose a very simple model of nepotism to explain theoretically these findings.

The paper is organized as follows. In section 2 we present a brief review of the literature on informal networks. In section 3 we proceed to describe the structure of the dataset. Section 4 contains the econometric analysis of the use of informal networks. Section 5 presents a theoretical model of nepotism to explain our findings. Concluding remarks follow.

2. A Brief Review of the Literature

A wide and burgeoning literature has examined, both empirically and theoretically, the methods used by workers and firms in the job matching process.

The main aspect that emerges from these works is the predominant role played by social networks (networks of relatives, friends, acquaintances) in facilitating the search for jobs and the matching between firms and workers.

According to studies carried out by Myers and Shultz (1951), Rees and Shultz (1970), Granovetter (1995) and Corcoran *et al.* (1980) with reference to the United States, it emerges that approximately 50% of workers currently employed have found employment through relatives and friends networks. In addition, a study of Holzer (1988) shows that job search conducted jointly with friends and relatives is the most efficient search method among the young unemployed Americans.

From a study recently conducted by Pellizzari (2004), using data from the European Community Household Panel (ECHP) for the period 1994-1999, it emerges that informal contacts are widely used by both firms and workers in most European countries. The estimated probability of finding a job through the use of personal contacts is very high in countries like Spain (45%), Portugal (38.5%), Greece (45%), France (34.4%), and Italy (37.9%). On the contrary, this percentage is relatively low in the Scandinavian countries. In Denmark, for example, only 17.7% of young graduates has adopted this method as a channel to enter in the labor market, in Finland this percentage is even lower (13.3%).

From a theoretical point of view, a variety of explanations of the use of social networks has been offered, mainly highlighting the positive aspects of informal networks in improving the quality of job matching.

An important strand of literature moves from the assumption of the existence of imperfect information in the labor market: the firm typically does not know the characteristics and productivity of workers and the latter do not have an adequate knowledge of the job (for example, a worker does not know if the job offered is in line with his expectations in terms of tasks performed, career prospects, etc.). In this context, the informal networks, providing information both to employers about not observable characteristics of workers, and to workers on the quality of the job, allow the realization of job matching characterized by higher productivity and lower turnover (Simon and Warner, 1992) and at the same time enable firms to reduce costs of search and publicity of the job vacant. They show that the use of informal methods of job search through the "old boy network" (referrals) is related to higher wages at the beginning, but lead to lower wage growth afterwards (because the referral quality is already revealed at the beginning but that of not referral is learned from time to time). However they admit to not be able to discriminate between the hypothesis of good matching and that of favoritism.

Usually the informal channels taken into considerations by firms consist in signalling provided by other workers already operating in the firm. According to Montgomery (1991), workers are typically linked to other potential workers of comparable skills, so firms have convenience to accept reports from their highly productive workers because this allows them to recruit with high probability workers with equivalent capacity.

On the other hand, workers have an interest to signal only people with high skills to maintain with the employer a good reputation and to avoid negative impact on future career in the firm (Rees, 1966; Saloner, 1985).

In addition, current workers have incentive to promote the integration in the firm of new highly productive workers if the remuneration of the workers is at least partly related to the firm performance or at those obtained by the team of workers ("team production").

According to these theories, since the informal channels allow the establishment of better match on the labor market, their use should be associated with higher productivity, lower turnover and higher wages.

Other analyses attempt to give an explanation for the presence of the signalling practice in terms of efficiency wages. Firms use this practice to select and monitor new recruits, because through "peer pressure" they may reduce the monitoring cost (Kugler, 2003). In fact, peer pressure is particularly effective if workers interacting in the workplace, are also linked by other social relations (Spagnolo, 1999). In addition, as shown by De Paola and Scoppa (2001), employing workers linked by family or friendship relation, firms are able to pay a lower

"efficiency wage" through the use of a more severe threat, consisting of penalties (for example wage reductions, fewer career opportunities etc..) addressed to all members of the network in case someone of its members behaves on the job in an opportunistic way. By joining this type of contract, workers accept a wage reduction in order to obtain employment for their relatives: this choice may be optimal in situations in which the unemployment rate is high.[1]

3. The Data

This section briefly describes the data and the construction of the sample. The data source for our empirical analysis is the *Bank of Italy Survey on Household Income and Wealth* (SHIW) carried out by the Bank of Italy since 1979. The SHIW is a biannual household survey that covers all regions in Italy and contains a broad range of information on about 20,000 individuals covering a total of about 8,000 Italian households and about 13,000 income-earners distributed over about 300 Italian municipalities.[2]

We use data from the 2004 wave that provides detailed information on demographic and social characteristics of individuals in the households such as age, gender, marital status, education, region of residence, as well as on their working activity (earnings, employment status, type of occupation, industry, firm size, work experience, and so on).

Key for our analysis is a subset of questions about the methods undertaken by individuals in finding a job. The question we use to discriminate between individuals who obtained a job through informal networks and individuals who used formal methods is the following: "How did you find your actual job? The possible answers are listed in Table 1. Respondents were allowed to choose at most three different answers. A similar question has been asked to unemployed. Table 1 reports the percentage regarding the different methods of job search used by both employed and unemployed individuals.

Table 1. Methods of job search adopted by employees and unemployed.

How did you get your job?	Employed	Unemployed
Contacted public job centre	11.39%	34.11%
Took part in interview, selection process with private employer	36.75%	37.62%
Sat written/oral tests as part of public employment competition	19.57%	10.62%
Applied to take part in public employment competition	11.45 %	14.80%
Read job vacancies in daily press	9.83%	28.53%
Placed or answered advertisements in daily press	3.42%	6.83%
Applied and/or sent resumé to private employers	11.97%	20.31%
Asked relatives, friends and acquaintances	**24.79%**	**35.24%**
Looked for job vacancies on the Internet	0.66%	2.92%

[1] A few works have tried to directly verify if in jobs that tend to be transmitted from parents to children, this transmission is due to nepotism or can be instead ascribed to human capital or physical capital transfer. In a series of paper, Laband and Lentz find that in some professions (for example, for lawyers and doctors, see Laband and Lentz, 1989 and 1992), children have an unfair advantage and are favored beyond their merits. On the contrary, Groothuis and Groothuis (2006) do not find nepotism in NASCAR cup drivers, since performance of family connected individuals are not lower than other drivers.

[2] SHIW data are freely available at www.bancaditalia.it.

Contacted private employment agency or temporary work agency	0.90%	6.17%
Looked for land, premises, equipment to start up business	2.66%	0.33%
Applied for permits, licences, loans to start up business	5.55%	0.66%
Other steps	0.62 %	0.53%

Table 1 shows that among employees in our sample almost 25% have found their job through social networks. It is the most widespread method, second only at the practice consisting in taking part in interview or a selection process with private employers (37%). If we consider unemployed, the percentage is even higher: 35% of them have tried to find a job through social networks. These results highlight the quantitative importance in Italy of informal networks to find a job.

To describe the phenomenon and to document the characteristics of the individuals who have used informal networks, we define the dependent dichotomous variable "*Informal*" that takes value one if the respondent got her job through social or family connections and zero otherwise. Table 2 lists the descriptive statistics for the main variables used in the analysis.

Table 2. Descriptive statistics of the variables used in the econometric analysis.

Variables	Obs.	Mean	Std.Dev.	Min	Max
Informal	3983	0.305	0.460	0	1
Woman	3996	0.363	0.481	0	1
Education	3996	10.332	3.387	0	20
Married	3996	0.571	0.495	0	1
Age	3996	38.389	10.231	16	65
Number of Jobs Held	3995	2.027	1.782	1	30
Family Network Size	3996	6.311	3.801	1	25
North-West	3996	0.278	0.448	0	1
North-East	3996	0.269	0.444	0	1
Centre	3996	0.220	0.414	0	1
South	3996	0.151	0.358	0	1
Islands	3996	0.081	0.273	0	1
Very Small City (<20)	3996	0.469	0.499	0	1
Small City (20-40)	3996	0.130	0.336	0	1
Medium City (40-500)	3996	0.275	0.447	0	1
Large City (>500)	3996	0.126	0.332	0	1
Worker's Productivity	3909	14.356	7.673	0.25	125
Wage Rent	3909	0.144	6.871	-21.679	110.636
Small Firm	3996	0.460	0.498	0	1
Medium Firm	3996	0.316	0.465	0	1
Large Firm	3996	0.199	0.399	0	1
Regional Unemployment Rate	3996	8.589	5.771	3.342	22.533

Females make up 36% of the sample. Education represents the number of years of schooling.[3] The average number of years of education is 10.3. Married people are 57%.[4] Individuals employed in small firm (with fewer than 20 employees) make up 46%, 32% works in medium firms (20-99 employees) while 20% works in large firms (100 or more employees).

[3] *Education* is set at 0 for no educational qualification; 5 for elementary school; 8 for middle school; 11 for some high school; 13 for high school; 18 for university; 20 for a postgraduate qualification.
[4] We set *Married* equal to zero if the individual has never got married, is widowed, separated or divorced.

Residents in the North-West or North-East constitute 55%, 22% lives in the Centre and 23% lives in the South and on the Islands.[5]

People living in very small towns (below 20,000 inhabitants), make up 47% of the sample. The average *Number of job held* (including the present job) by a worker is 2. *Family network size* is the number of adults in the household plus the number of brothers and sisters of the household head or his spouse plus the number of their children living outside the household. The average *Family network size* is 6.3.

Worker's earnings (measured in thousands of euros) are used as a proxy of *Labour Productivity*. The average level is 14.4. Furthermore, we calculate a variable called *Wage Rent*, defined as the difference between the worker's wage and the average wage he/she could earn in alternative occupations in the same region and in the same industry in which he is employed. The average *Regional Unemployment rate* is 8.6.

Preliminary evidence shows that the use of informal networks is very heterogeneous according to individual and socio-demographic characteristics. 29% of men uses informal networks and 23% of women. The South and the Islands are the regions where social connections are more pervasive: respectively 32% and 36%. Furthermore, evidence shows that jobs found through personal contacts are concentrated among less educated people: 37% of individuals with less than high-school use informal networks, while only 18% of high school graduate and 9% of individuals with a college degree use them. Furthermore, the use of informal networks is prevalent among workers with low-earnings.

A more complete analysis of the use of informal networks is carried out through the econometric estimations in the next section.

4. An Econometric Analysis of the Use of Informal Networks in Italy

In this Section in order to analyze the characteristics of the individuals who used informal networks, we estimate the probability of using informal networks with several specifications of a Probit model.

We restrict our sample to private employees, aged between 15 and 65 years. Although we have information on job search methods of self-employed workers and unemployed, in the econometric analysis we consider only employees since our aim is to investigate if informal networks are a channel used to favor connected people: obviously, this aspect is not important

[5] North-West includes the following regions: Piedmont, Valle d'Aosta, Lombardy, Liguria; North-East includes Veneto, Trentino Alto Adige, Friuli Venezia Giulia, Emilia Romagna; Centre includes Tuscany, Lazio, Marche, Umbria; South includes Abruzzi, Campania, Apulia, Molise, Basilicata, Calabria; Islands includes Sicily and Sardinia.

in the case of self-employed workers and it is not observable for public employees since they have to go through public competition to get a job.

In Table 3 are reported our estimates of Probit models. The dependent variable is *Informal*. The reported coefficients in the Table are marginal effects, evaluated at the mean values of the explanatory variables in the sample. In all the equations sample weights provided in the dataset are used.

Table 3. Probit Model Estimates. Dependent variable: *Informal*.
Sample: Private employees. The coefficients represent the marginal effects.

	(1)	(2)	(3)	(4)	(5)
Female	-0.000	0.003	-0.029	-0.035	-0.034
	(0.020)	(0.021)	(0.021)	(0.021)	(0.021)
Married	0.014	0.004	0.034	0.034	0.033
	(0.020)	(0.020)	(0.021)	(0.021)	(0.021)
Education	-0.026***	-0.024***	-0.020***	-0.018***	-0.018***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
North-East	0.055*	0.066**	0.071**	0.059*	
	(0.030)	(0.030)	(0.031)	(0.031)	
Centre	0.039	0.052*	0.040	0.027	
	(0.029)	(0.030)	(0.030)	(0.030)	
South	0.186***	0.176***	0.128***	0.082**	
	(0.035)	(0.036)	(0.036)	(0.037)	
Islands	0.379***	0.367***	0.282***	0.218***	
	(0.041)	(0.042)	(0.045)	(0.047)	
Small City (20-40)	-0.034	-0.030	-0.033	-0.030	-0.038
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Medium City (40-500)	-0.037*	-0.027	-0.030	-0.026	-0.024
	(0.021)	(0.022)	(0.022)	(0.022)	(0.022)
Large City (>500)	-0.128***	-0.111***	-0.105***	-0.104***	-0.135***
	(0.029)	(0.030)	(0.031)	(0.031)	(0.029)
Family Network Size		0.012***	0.011***	0.011***	0.011***
		(0.003)	(0.003)	(0.003)	(0.003)
Number of Jobs Held		0.016***	0.016***	0.016***	0.017***
		(0.006)	(0.006)	(0.006)	(0.006)
Medium Firm Employee			-0.113***	-0.110***	-0.110***
			(0.021)	(0.021)	(0.021)
Large Firm Employee			-0.121***	-0.113***	-0.114***
			(0.026)	(0.026)	(0.026)
Worker's Productivity			-0.006***	-0.020***	-0.021***
			(0.002)	(0.004)	(0.004)
Wage Rent				0.016***	0.018***
				(0.004)	(0.004)
Regional Unemployment Rate					0.007***
					(0.002)
Observations	3983	3983	3896	3896	3896
Pseudo R-squared	0.088	0.098	0.119	0.125	0.121
Log-likelihood	-2233.540	-2209.126	-2117.906	-2104.122	-2112.933
obs. P	0.305	0.305	0.308	0.308	0.308

Notes: the dependent variable is *Informal* that takes value 1 if the individual has used informal networks to find a job. Sample weights are used. The standard errors (correct for heteroscedasticity) are reported in parenthesis. The symbols ***, **, * show that the coefficients are statistically significant, respectively, at 1, 5, and 10 percent levels.

Column (1) shows the estimates of a model in which we only use socio-demographic characteristics as explanatory variables. Female and married people do not appear to use more frequently informal networks. On the other hand, education is strongly negatively related to the use of informal networks: one more year of education reduces the probability of using the informal channel of search of about 2.6 percentage points. The coefficient is significant at the 1 percent level. The dummies representing geographical areas have been entered in the regression

to capture the effects of different regional labor markets or heterogeneity in the type of social relationships established among individuals. Results in column (1) show that regions in South and Islands (the less developed areas of Italy) use much more intensely informal networks, respectively 19 and 38 percentage points more than North-West regions, the reference category.

In regression (1), we also control for city size dummies. Results show that informal networks are used much more often in small cities (fewer than 20,000 inhabitants): in cities of more than 40,000 inhabitants informal networks are used 4% less than in small towns, while are used 13% less in cities larger than 500,000 inhabitants. This finding confirms the idea that more intense social ties are established in towns with a low number of inhabitants rather than in the large cities since it is easier to entertain personal relationships and to extend the network of acquaintances.

In column (2) we consider two factors that may affect the extent of the network of connections: *Family Network Size* and the *Number of Jobs Held*. The estimates show that one more member in the family network increases by 1.2% percentage point the probability of using informal networks (strongly significant at the 1 percent level). Similarly, the number of jobs held significantly increases the probability of finding a job through informal networks (+1.6%): past job experience allows a worker to enlarge the network of acquaintances with ex-colleagues and so on (see also Cingano and Rosolia, 2007).

In column (3) we consider as explanatory variables *Worker's Productivity* (as proxied by the worker's wage) and two firm size dummies: *Medium Firm* (20-99 employees) and *Large Firm* (100 or more employees). The results show that – even controlling for worker's educational level – informal networks tend to be used much less for high-productivity jobs (the coefficient is significant at the 1 percent level). Furthermore, informal networks are used primarily in small firms: employees in medium and large firms have a probability of using informal networks about 12 percentage points lower.

In column (4) we include as explanatory variable the worker's wage rent. We expect that the interests of a worker to search informal channels are higher the larger the wage rent he/she might obtain in a given job. On the other hand, in jobs paying a wage rent there is a greater interest for current employees to contact relatives and friends to allow them to gain a nice wage. We find that an increase in the wage rent strongly increases the probability of using informal channels. The simple model we propose in Section 5 offers a theoretical explanation for this finding.

In column (5) we consider the unemployment rate at regional level. Regional unemployment rates are taken by 2004 Labor Force Survey conducted by ISTAT (the National Statistic Institute). It is plausible to think that the propensity to use informal channels as job search method may depend on the state of the regional labor market. The estimates show that the unemployment rate is highly significant: the probability of using informal channels

increases by a 0.7 percentage point for each point of unemployment.[6] Note that since the unemployment rate is defined at regional level, perfect collinearity does not allow us to estimate regional dummies. The standard errors reported in column (5) are corrected for the potential clustering of the residual at the regional level.

In Table 4 we also report the OLS estimates as robustness exercise and useful comparison with respect to the Probit estimates shown in Table 3 (see Angrist, 1999). From Table 4 it emerges that the estimated coefficients and their significance levels using OLS are very similar to Probit estimations.

Table 4. Ordinary Least Square Estimates. Dependent variable: *Informal*.
Sample: Private employees.

	(1)	(2)	(3)	(4)	(5)
Female	-0.000	0.003	-0.019	-0.023	-0.022
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Married	0.015	0.006	0.029	0.030	0.029
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Education	-0.024***	-0.022***	-0.019***	-0.017***	-0.017***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
North-East	0.051*	0.062**	0.064**	0.055**	
	(0.026)	(0.026)	(0.026)	(0.026)	
Centre	0.037	0.050**	0.041*	0.032	
	(0.024)	(0.024)	(0.024)	(0.024)	
South	0.175***	0.165***	0.130***	0.096***	
	(0.031)	(0.031)	(0.032)	(0.032)	
Islands	0.364***	0.348***	0.282***	0.237***	
	(0.038)	(0.038)	(0.039)	(0.040)	
Small City (20-40)	-0.034	-0.031	-0.034	-0.032	-0.041
	(0.026)	(0.026)	(0.026)	(0.026)	(0.027)
Medium City (40-500)	-0.034	-0.024	-0.029	-0.025	-0.022
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Large City (>500)	-0.114***	-0.092***	-0.082***	-0.080***	-0.122***
	(0.028)	(0.028)	(0.029)	(0.028)	(0.029)
Family Network Size		0.012***	0.012***	0.011***	0.011***
		(0.003)	(0.003)	(0.003)	(0.002)
Number of Jobs Held		0.015**	0.015**	0.015**	0.015***
		(0.006)	(0.006)	(0.006)	(0.006)
Medium Firm Employee			-0.116***	-0.113***	-0.114***
			(0.021)	(0.021)	(0.021)
Large Firm Employee			-0.124***	-0.112***	-0.114***
			(0.026)	(0.026)	(0.026)
Worker's Productivity			-0.003**	-0.014***	-0.016***
			(0.001)	(0.003)	(0.003)
Wage Rent				0.013***	0.014***
				(0.003)	(0.003)
Regional Unemployment Rate					0.009***
					(0.002)
Constant	0.497***	0.359***	0.440***	0.601***	0.603***
	(0.039)	(0.047)	(0.048)	(0.060)	(0.060)
Observations	3989	3989	3896	3896	3896
R-squared	0.107	0.118	0.140	0.146	0.141

Notes: OLS estimates. The dependent variable is *Informal* that takes value 1 if the individual has used informal networks to find a job. Sample weights are used. The standard errors (correct for heteroscedasticity) are reported in parenthesis. The symbols ***, **, * show that the coefficients are statistically significant, respectively, at 1, 5, and 10 percent levels.

[6] We have also considered the rate of employment instead of unemployment – because the latter could be biased because of discouraged workers who do not search for jobs – obtaining substantially similar results (not reported).

5. Informal Networks and Favoritisms in Recruitment

Several findings emerged in the previous Section are in stark contrast with theories that consider informal networks as an efficient method of matching between firms and workers. In this Section we offer a very simplified version of the model of nepotism presented in Ponzo and Scoppa (2008) in order to explain theoretically some puzzling empirical findings.

Whereas it is difficult to reconcile nepotism carried out by employers with their profit maximizing behavior, it is easier to explain favoritism in recruitment by making recourse to an agency relationship in an organization in which the decision-maker (in charge of recruitment decisions) is an agent of a principal and he will not be significantly penalized by favoring friends or relatives (while obtaining personal benefits) even if they are low-productivity candidates.

We consider a firm or an organization in which a wage *W* is paid to lower-level employees and the alternative wage (outside option) for these workers is $\underline{w}$, so that a wage rent equal to $(W - \underline{w})$ is paid. [7] The manager in charge for recruitment is an agent of the principal-owner and he earns a performance-related pay: $W_M = b\Pi$, where *b* is a parameter, $0 \leq b \leq 1$, representing the "power" of incentives and Π are firm profits. The higher is *b*, the more the manager's pay depends on firm performance ("high-powered incentives").

Job applicants in the population are heterogeneous with respect to their productivity: workers may have productivity Y_B (low productivity) or Y_G ("high productivity), where $Y_G > Y_B$. The manager's utility – if he behaves loyally in the recruitment task, choosing a high productivity worker – is:

[1] $$U_H = b(Y_G - W)$$

where $(Y_G - W)$ are firm profits.

Suppose that the manager belongs to a network of relatives and friends. If the manager favors his low-ability "nephew" or a friend of his, he might obtain a pecuniary benefit, or alternatively his utility may be increased because he cares for his relative's or friend's utility (altruistic favoritism). In fact, the hired worker increases his utility by $(W - \underline{w})$. In order to relate this aspect to the empirical analysis, we presume that these types of hiring would be classified by employees as obtained through "informal networks".

[7] Wage rents might be justified by a variety of reasons: efficiency wages, union and public sector wage premium. Krueger and Summers (1988), among others, document that workers employed in some sectors gain a considerable wage rent, controlling for observable firm and worker characteristics. Unionized and large firms typically pay a wage premium ranging from 15-16% to 30% (Blanchflower and Bryson, 2003; Card, 1996). Gregory and Borland (1999) show that for most OECD countries public wages are higher than private wages. Controlling for relevant worker characteristics public sector workers obtain wages that exceed private sector workers by 10% to 25% and that long queue wait for public sector jobs (Krueger, 1988).

Without distinguishing between pecuniary or altruistic benefits, we suppose that the utility of the manager increases by a fraction of the wage rent $\lambda(W-\underline{w})$, where $0 \le \lambda \le 1$, if he favors the recruitment of a relative or a friend. On the other hand, we suppose that if the manager *i* indulges in favoritism, he incurs in moral costs denoted by c_i. Individuals are heterogeneous as regards moral costs and c_i is distributed in the population according to a density probability function $f(c)$ and cumulative distribution function $F(c)$.

If the manager favors the hiring of a connected agent, the manager's utility is:

[2] $$U_F = \lambda(W-\underline{w}) + b(Y_B - W) - p_s S - c_i$$

where *S* is the value of a penalization inflicted if favoritism is detected by the principal and p_s is the probability of detection. Note that in case of opportunism by the manager, firm profits $(Y_B - W)$ are lower with respect to the hiring of a high-productivity worker.

Obviously, favoritism takes place if $U_F > U_H$, that is, if , using equations [1] and [2]:

[3] $$\lambda(W-\underline{w}) + b(Y_B - W) - p_s S - c_i > b(Y_G - W)$$

from which we obtain the following condition:

[4] $$\lambda(W-\underline{w}) - b(Y_G - Y_B) - p_s S = \tilde{c} > c_i$$

Nepotism takes place if the manager has moral costs lower than the threshold $\tilde{c}$. Therefore, using the cumulative distribution function $F(c)$ and the condition [4], in the aggregated, the proportion of nepotistic recruitments is equal to:

[5] $$F(\tilde{c}) = F\left[\lambda(W-\underline{w}) - b(Y_G - Y_B) - p_s S\right]$$

Equation [5] shows that nepotism is more widespread: 1) the higher the wage rent $(W-\underline{w})$ paid to the worker; 2) the lower the productivity differentials between high and low productivity workers $(Y_G - Y_B)$; 3) the higher the intensity of family ties λ; 4) the lower is the intensity of incentives, *b*; 5) the higher the expected penalization for opportunistic managers.

Some of our previous empirical findings can be interpreted in terms of this simple model. We have found that the higher the wage rent paid in a job, the higher is the use of social networks: larger rents stimulate workers to seek the help of relatives and friends to get a "good job" and managers are more willing to favor socially connected individuals. Moreover, high unemployment might make more desirable a job, inducing individuals to use informal networks to escape unemployment.

Secondly, we have shown that informal networks tend to be used less in high-productivity jobs and for highly educated workers: in these cases, the manager would be penalized severely, through performance related pay, by hiring a low productivity connected worker in place of high-productivity candidates.

The strong significance of Southern regions dummies may also be interpreted in terms of our theoretical model. Southern regions are characterized by strong family ties (Alesina and

Giuliano, 2007; Bentolila and Ichino, 2006) which make individuals more keen to help relatives also in transferring jobs. Furthermore, Southern regions show a greater propensity to opportunistic behavior (as pointed out in the classical works of Banfield (1958) and Putnam (1993) and more recently by Ichino and Maggi (2000).

Although many determinants of nepotism cannot be observed, our empirical findings are suggestive, because they are consistent with an explanation of the use of informal networks based on favoritism rather than on the efficiency explanation.

6. Concluding Remarks

A large literature considers the recourse to the help of relatives, friends and acquaintances to find a job as an efficient mechanism, in terms of better job matching, better selection of employees and higher effort provided.

Using individual data drawn from the Bank of Italy Survey on Household Income and Wealth (SHIW) regarding the method used by employees to find their job we show that the use of informal networks in Italian labor markets is associated with low educational levels, low productivity jobs, high unemployment areas, high wage rent, number of job experiences, size of family network.

Our interpretation of the evidence is that informal networks – rather than being an efficient channel of information transmission – may interfere with a genuine process of selection of workers, favoring socially connected people in place of more talented workers.

In order to corroborate this view, we have proposed a simple model of nepotism, showing that favoritisms in recruitment are more likely the stronger the family ties are, the lower the job productivity, the higher the wage rent, the higher the unemployment.

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