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The Role of Social Networks and Ties in Finding a Job in Economies Characterized with High Youth Unemployment: A Case study of Algeria and Jordan

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Using nationally representative data from Algeria and Jordan, this paper shows that social networks and ties play an important role in labor market intermediation in Arab countries. In addition to descriptive analysis, we utilize binary probit regressions to investigate determinants of the probability of finding a job through social contacts. The study finds that social networks are a popular method to find a job in Algeria and Jordan but not for skilled jobs. Such methods increase the probability of obtaining less secured informal jobs. Also, the study shows that despite the importance of public sector agencies in the job search process, less than 5% in Algeria and 9% in Jordan of employed youth state that such agencies have helped them transit into employment.

Classification JEL:C25, J23, J64, O12.

Keywords: Job search methods, social networks, labor market, Algeria, Jordan.

1. Introduction

Utilizing communal ties in searching for and finding jobs is a widespread phenomenon in Arab countries (Lassassi and Muller, 2013). This phenomenon extends to advanced economies as well. In USA, for example, social contacts are the main channel of finding jobs of 30% to 60% of employed (Ioannides and Loury, 2004). Social networking, as a less costly method, can enhance information transmission in labor market and in effect improves the match between workers and firms (Munshi, 2003). However, such methods may result in adverse effects on both

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equity and economic efficiency in labor markets, particularly those characterized with high unemployment rates and underdeveloped job intermediation. In this vein, Assaad (2014) argues that employment, particularly in public sector, in much of the region privileges certain social groups for political motives. Jordan and Algeria, like many Arab countries, have been confronted with growing rates of high youth unemployment and limited capacity of the economy to create enough and decent jobs. The existence of such labor market problems fuels a heightened sense of social injustice and may lead to socio-political instability as happened during "Arab Spring". The current study aims at providing a first step in understanding the role of social contacts and ties in finding employment in two Arab economies characterized with high youth unemployment, namely Jordan and Algeria. Better understanding of job matching and labor market intermediation can enhance labor market policy making in the two countries, particularly in terms of selecting effective instruments that promote youth employment. The study also enriches the limited literature on the role of social contacts in Arab labor markets.

After the introduction, the study is outlined as follows: Labor markets indicators of both countries will be handled in Section 2. Section 3 reviews the existing literature on job search and social networks, focusing attention on the studies conducted in Arab countries. Section 4 discusses the methodology followed and the data used in the paper. Section 5 discusses descriptive results. In Section 6, we present the empirical results, and section 7 concludes the work.

2. Labor markets in Algeria and Jordan

The economies of both countries differ in terms of their natural resources and structure. While Algeria is classified as an energy-producing and exporting economy, Jordan, as a services economy, depends heavily on imported energy sources and in part on regional and foreign aid. However, both countries are vulnerable to external factors, basically volatile aid and energy prices. They also tend to share the fact that the recent economic growth is not sufficient to sustainably generate enough jobs (Furceri, 2012; Taghdisi-Rad, 2012). Although they have weathered the storm of 'Arab Spring', Algeria and Jordan remain to suffer persistently from several problems encountering their labor markets.

In addition to cultural and social similarities, to some extent, Algerian and Jordanian labor markets share common stylized characteristics (see Table 1). The public sector in both countries is oversized, employing a large fraction of the workforce, around 31% in Algeria and 40% in Jordan (World Bank, 2013). The size of the informal sector is also large and ranges around 46% in Algeria and 44% in Jordan (IMF, 2013; UNDP, 2013). Unemployment, which is more severe among females and youth, is a daunting challenge facing both economies. This is coupled with low participation rates especially for females. Despite these efforts, youth and female unemployment rates have remained in the double digits over the last decade. Youth unemployment has proven hard to resolve in both countries (Kreishan and Alhawarin, 2014; Furceri, 2012). The current population shares of 15 to 24 years-old account for about 17% and 20% of the total population in Algeria and Jordan, respectively, as shown in Table (1). The share of those younger than 15 is also substantial particularly for Jordan (around 29% for Algeria versus 35% for Jordan). The latter two indicators suggest that youth unemployment, particularly in Jordan, may remain high in the medium terms, and the two countries will need to create enough jobs for a large youth bulge.

Long-term unemployment (i.e. unemployment spells for more than 12 months) in Algeria concerned 72.2% of the unemployed in 2015 (74% and 67.6% for males and females, respectively). On the other hand, in Jordan in 2014, it amounts to almost 38%; 34.4% and 46.3%, for females and males respectively.

Table 1: Labor market indicators in Algeria and Jordan

	Algeria (2015)			Jordan (2014)		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
Population **(10^3)**	20235	19728	39963	3441	3234.3	6675.3*
0 - 14 years (%)	29.2	28.4	28.8	35.1	33.2	34.6
15 – 24 years (%)	16.8	16.6	16.7	20.6	18.9	19.8
25 - 64 years (%)	48.3	49	48.7	39.3	43	40.6
65 and over (%)	5.7	6	5.9	5	4.9	5
Labor force participation rate (%)	66.8	16.4	41.8	60	12.6	36.4
Labor force participation rate (%) - Youth 15-24 years	41	8.8	25.2	38.1	7.6	23.2
Employment-population ratio (%)	60.2	13.6	37.1	53.7	9.8	32
Employment-population ratio (%) - Youth 15- 24 years	30.1	4.8	17.7	28.1	3.5	16.1
Unemployment rate (%)	9.9	16.6	11.2	10.1	20.7	11.9
Unemployment rate (%) - Youth 15 - 24 years	26.7	45.3	29.9	26.4	53.3	30.6
Unemployment rate (%) - 25 years and over	7	12.3	8	6.1	15	7.5
Long-term unemployment (%) (>=12 months)	74	67.6	72.2	34.4	46.3	37.9

Source: Official labor force survey - Algeria 2015 (ONS) – Jordan 2014 (DoS) Employment and unemployment survey. *Excluding the Syrian refugees and foreign workers.

2.1. Formal labor market intermediation

Algeria and Jordan have implemented several active polices to influence the performance of their labor markets. A variety of initiatives to strengthen job information networks were carried out, with the aim to improve labor mobility, enhance job matching and shorten the process of job search and filling vacancies.

In Algeria, (see Musette et al, 2014), the National Employment Agency (ANEM) is the key governmental player regarding employment intermediation and labor market information. ANEM has different functions and schemes towards different target groups, primarily

unemployed youth. By law, private companies and municipalities must inform ANEM about job vacancies they have, besides the number of jobs they have recently created. Non-compliance results in employers to be fined and penalized. Currently, this agency attempts to vocationally integrate unemployed youth into the labor market through promising schemes in co-operation with private firms. Among others, for instance, it tries to match unemployed youth with available jobs through subsidized work contracts, irrespective of youth's education levels. On the other hand, the Public Service Directorate is the main governmental branch in charge of announcing and managing public sector vacancies. The Algerian ministry of labor licensed private employment agencies to get involved in improving the employability of Algerians.

Department of Employment and Training (DET), an autonomous agency supervised by the Ministry of Labor (MOL), performs an important labor market intermediation function in Jordan (Angel-Urdinola et al., 2012). It also holds the responsibility of authorizing and supervising private employment agencies, which amounted to 73 companies in 2016. Practically, DET and its branches in various governorates require private employers to report their employment needs, and simultaneously keep records of local job seekers. MOL also organizes every year National Employment Campaigns (NEES) and gather employers and job seekers to interact face-to-face. In addition, there exist several public and private internet-based job search services, which provide various services for job seekers in Jordan. On the other hand, employment and job matching in the public sector employment are governed by the Civil Service Bureau (CSB).

It appears that Jordan has implemented better and more efforts in this respect compared with Algeria. However, the performance of public agencies in charge of employment services in the MENA region and Arab countries is not satisfactory and largely underdeveloped. The role of the government in labor market intermediation is constrained by a number of obstacles, including a lack of proper funding, training, and staff. Moreover, public agencies function in a very complicated socio-economic environment, including high rates of unemployment and informality (Angel-Urdinola et al., 2012).

3. Previous studies in the Arab countries

The available literature pertaining to the role of networks of personal contacts in mediating employment opportunities has been largely conducted on advanced labor markets, using economic, sociological, and psychological models[3]. In addition to highlighting the importance of them in job-search, labor economists have studied potential influences of social networks, as an informal information mechanism, on the probability to find a job, to have more offers, and to earn higher wages. Overall, the studies of job search reveal that around 50% of individuals obtain jobs or information on job opportunities through friends and relatives (Zenou and Wahba, 2005; Patacchini and Zenou, 2012). Most of empirical evidence approximates unobserved social networks and communal ties by using population density and information on ethnic minorities or migrants. Few studies (see, for example Dang, 2015) apply direct measures to observe social networks (e.g., number of employed friends, number of schoolmates, and number of greetings in special occasions).

In the Arab countries, similar to other developing countries, this area has attracted few studies. In his attempt to compare between the effects of informal and formal institutions on labor market dynamics in Egypt, using in-depth interviews, Assaad (1993) shows that hiring workers in the construction activities, particularly craft workers, depends partly on personal ties and social networks. The study also indicates that family long-lasting ties with employers, in the informal sector, can also enhance the opportunity of a jobseeker to gain access to an apprenticeship. Using the same data in the latter study, Assaad (1997) provides evidence on the role of kinship ties and social networks in segmented labor markets. Among others, his findings show that there exists a rationing of entry into the construction sector determined significantly by a worker's age and region of birth. The study, however, provides inconclusive statistical evidence on the contribution of kinship ties and social networks to determining the rationing process.

Zenou and Wahba (2005) offer evidence on the effect of social contacts in the process of job search in the context of Egypt. Specifically, the latter study handles the relationship between the size and quality of social

[3] For an extensive survey of economic studies see Jackson (2011).

networks and job-finding, and the processes of information acquisition and transmission from friends and relatives to job seekers. The study uses population density as a proxy for the size of social networks and classifies workers according to their education into two groups (low educated and high educated), with the assumption that the former group uses only social contacts and ties while the latter type uses both formal and informal channels. The empirical results they show match very well the theoretical expectations of their model. In general, the study first indicates that the probability to find a job through social networks rises and is concave with population density. Second, this relationship decreases with education and local unemployment rates and surprisingly becomes negative when population exceeds a certain size.

Lassassi and Muller (2013) analyze Algerian data obtained from the Employment Survey carried out by the National Office of Statistics (1997, 2003 and 2007) and employment matching data gathered in 2005 using a regional survey that aimed to explore labor dynamics in Algeria, Morocco and Tunisia. Primarily, the paper is concerned with showing how social networks influence the probability to find a job and identifying the characteristics of employers that are most likely to utilize such networks in hiring decisions. Their empirical logit models follow Zenou and Wahba (2005) in using population density to represent the size of social networks. Most importantly, among others, Lassassi and Muller (2013) show that a high proportion of job seekers, regardless of gender and age, utilizes friends and relatives in their search for a job and this proportion has increased markedly from about 57% in 1997 to 86% in 2007. They report that around 40%, in 2003 and 2007, of all Algerian workers identify that they obtained their jobs through personal or family relationships. This pattern tends to increase slightly for men during the period 2003 to 2007, while social networks are found to contribute less and less in helping women transit into employment.

The current study utilizes more recent and detailed data to enrich the literature in Algeria and provides evidence on the role of social ties in Jordan’s labor market for the first time.

4. Methodology and Data considerations

The study utilizes micro data obtained from nationally representative labor market surveys. The first wave of Jordan Labor Market Panel Survey (JLMPS) is the source of our Jordanian data. It is a large scale survey offering very detailed data on a wide range of labor market aspects and covering (5102) households. It was conducted in 2010 by the Department of Statistics with the cooperation of the Economic Research Forum (ERF). In the context of Algerian data, we use the Labor Force Survey carried out in 2010, which encompassed (14592) households and was administered by the National Statistical Office.

Both surveys have useful, and to some degree comparable, job searching and finding questions. Workers are asked to report the main method of job search used to find their current jobs. To the question *How did you find this job?* Algerian workers can choose one answer from a list of seven alternatives: Answering a newspaper ad, personal or family relationship, contest or exam, approaching the business, assigned by the school after training, through public agencies, or other methods. On the other hand, the Jordan Labor Market Panel Survey asks an employed to choose the first and second most important search methods out of twelve options: TV/newspaper ads, visiting institutions and workplaces, relatives, friends and current and previous officials, applying in Ministry of Labor offices, applying in Civil Service Bureau, internet sites, using land lines and cell phones, waiting at a place for workers gathering, seeking a private project, seeking a private project finance, through family, and others. In this paper we take into account only the first choice. To harmonize Algerian and Jordanian data, in terms of the employed, we have grouped the answers into five categories: 1) Newspaper ads, 2) Friends and relatives, 3) Asking at work place, 4) Government employment office, 5) Other methods.

Similar alternatives were possible for questions asking for methods through which currently unemployed job seekers are looking for jobs. However, unlike the employed, unemployed individuals could choose more than one answer. For Algeria they could choose from four options: registration with a labor office, asking at the workplace, personal relationships, and other methods. The Jordan Labor Market Panel Survey uses the same above choices provided to Jordanian employed, excluding the last two options (others and through family). Similarly, we harmonize

data by grouping jobseekers' answers into four categories: 1) Government employment offices, 2) Asking at the work place, 3) Friends and relatives, 4) Other methods.

We estimate a number of probit models, focusing attention on youth. Our models aim at analyzing the determinants of the probability of an individual to find a job through personal or family relationships. To correct for potential sample selection bias, we draw on Heckman test, which will verify and quantify the selection bias in the estimated dependent variable.

5. Descriptive analysis

5.1. Job search methods used by unemployed and the role of social networks

Table (2) summarizes responses of currently unemployed people on whether they have utilized one or more job-search methods. Several important patterns can be drawn from the table. *Firstly*, job seekers considerably rely on friends and relatives as a key job search method, both in Algeria and Jordan (Nearly 83% and 64% in Algeria and Jordan, respectively). However, while this method turns out to be the most frequently used method in Algeria, it ranks second in Jordan, with "*Asking at the work place*» being the first method. This pattern occurs regardless of age groups (i.e. youth and adults) and gender. Whereas the *"Government employment offices*" method is common among female job seekers, it tends to be extremely less popular than using friends and relatives among unemployed youth and adult males in both countries. For Algeria, similar overall results were observed in earlier data (Lassassi and Muller, 2013).

Secondly, unemployed females in Jordan are markedly less likely to employ friends and relatives in their search for work, while they depend more heavily on the other methods. For example, around 50% of young female job-seekers in Jordan use this informal method in comparison to nearly 72% for their male counterparts. In the case of Algeria, such indicators are also in favor of males, but with much slighter differences

Table 2: Search methods used by job seekers

	Algeria (2010)			Jordan (2010)		
Youth (15-24)	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
Government employment offices	59.9	53	78.7	44	33.9	60.5
Asking at the work place	52.5	46.1	69.8	69.6	75.3	60.5
Friends and relatives	**83.4**	**85.9**	**76.7**	**63.7**	**71.9**	**50.3**
Others	25.1	25.3	24.6	63.7	65.7	60.5
Adults (25-59)	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
Government employment offices	71.6	65.8	81.6	35.7	23.8	54.7
Asking at the work place	67.3	61.1	77.8	65.5	71.3	56.3
Friends and relatives	**84**	**86.8**	**79.3**	**61.9**	**67.1**	**53.6**
Others	27.7	26.2	30.2	62.1	65.7	56.3

NB: Unemployed could choose more than one answer. Source: Computed by the authors from the official labor force survey in Algeria 2010 and the Jordan Labor Market Panel Survey2010.

5.2. The role of social networks and ties in employment

Informative job-search methods should principally enhance the efficiency of labor markets by attaining a better allocation of resources (i.e. labor). Given the distressing indicators characterizing labor markets in Algeria and Jordan (e.g. youth unemployment and low participation rates, particularly for women), the data provided in Table (3) can suggest only how effective each job search route is compared with the other methods. Also, one must bear in mind that the responses analyzed in Table 3 are taken from currently employed workers about how they found their way into labor market, while Table 2 depends on responses reported by current unemployed. Accordingly, the comparison between the two tables in order to reflect on the benefits of each job-search method will be only suggestive. A perfect evaluation of the overall effectiveness of the job search process necessitates more intensive, and may be panel, individual level data.

Table 3: Percentage of jobs found by employed workers using each method

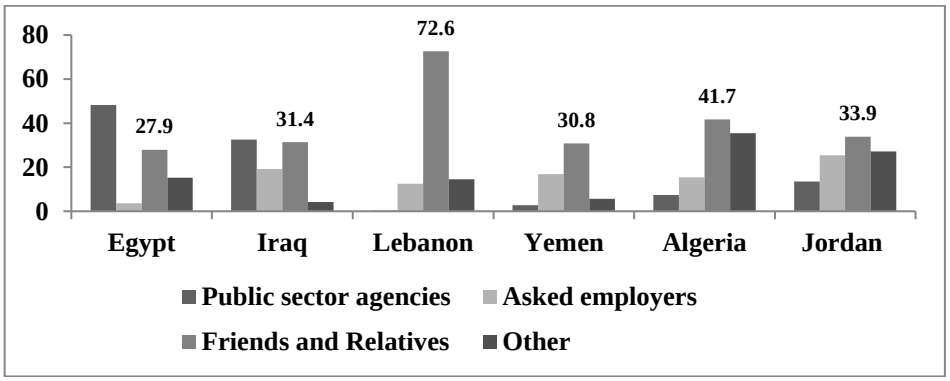
	Algeria (2010)			Jordan (2010)		
Youth (15-24)	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
Newspaper ads	4.5	4.1	7.4	14.7	15.4	10.3
Friends and relatives	**51.5**	**53.4**	**35.5**	**39.4**	**40.6**	**31.7**
Asking at the work place	20	20.6	15	30.3	29.2	37.2
Government employment office	4.5	2.9	17.5	9	7.8	16.5
Others	19.5	19	24.6	6.6	7	4.3
Adults (25-59)	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
Newspaper ads	9.2	9	10.2	11.3	12.5	6.5
Friends and relatives	**39.5**	**42.2**	**24.7**	**33**	**35.2**	**26.3**
Asking at the work place	14.5	16	6.1	31.1	32.3	24.4
Government employment office	8	6.6	15.9	20.6	15.6	40.7
Others	28.8	26.2	43.1	4	4.4	2.1

Source: Computed by the authors from the official labor force survey in Algeria 2010 and the Jordan Labor Market Panel Survey 2010.

As a whole, social networks by means of obtaining information or referrals from friends and relatives *comparatively* prove to be the most, or among the most, effective job-search channels as reported by employed themselves. One average, between a quarter and a half of all adult and youth respondents state that they became employed relying largely on friends and relatives. Although the significance of social networks in job-finding for Jordanian women is substantial and has risen, comparing between youth and adult females, such channels play less important roles than directly contacting employers and applying through public sector agencies. This result holds true also in case of Algerian adult females, who identify that government offices are more vital in this process (see Lassassi and Muller, 2013 for earlier comparable findings for Algeria). Overall, interacting directly with employers plays a smaller role in Algeria, ranking second and third to using friends and relatives, for youth and adults correspondingly. However, the effectiveness of this method tends to have clearly improved as its percentage contribution increased over-generationally (almost 20% for youth versus 14.5% for adults).

One interesting aspect of Table (3) is that the importance of social networks in finding jobs is greater for youth, irrespective of gender. Relying on friends and relatives is on average responsible for about 52% and 39% of all hires in terms of the young employed in Algeria and Jordan, respectively, compared to apparently lower percentages in the case of adults. Except for Algerian women, the opposite conclusion holds for the role of government employment search methods, as its contribution to finding jobs has decreased dramatically (by around 50%) in the two countries. Such gender and age differences will be statistically tested in our empirical analysis using probit models (see below).

Figure 1: Role of social contacts and other methods in finding a job in a group of Arab countries



Sources: Several statistics reports- Dos (Jordan), ONS(Algeria), CAPMAS (Egypt), COSIT (Iraq), CAS (Libya), CSO (Yemen). Lebanon (CAS).

As depicted in Figure 1, which is concerned with workers aged between 15 and 65, the phenomenon of depending on social networks in employment extends to other Arab countries. Except Egypt and to some extent Iraq, it is evident that social networks are the main method in such a process, with its contribution varying between almost 73% in Lebanon and 28% in Egypt.

6. Estimation results

6.1. Determinants of employment using social networks

To delve more deeply in the role of social networks in finding jobs, probit models with selection are run on the employed samples[4]. In both models reported in Table 4 below, we corrected selectivity by estimating the probability of an individual to be employed[5]. The dependent variable is binary taking a value of one if social networks are the main method of obtaining a job and zero otherwise. In Table 4 (Model 1) the estimation incorporates the same explanatory variables for the two countries for the whole sample and for youth, Table 4 (Model 2) repeats the same estimation using additional variables available only for one of the two countries. The data we use allow us to control for different variables at the individual, household and region levels. Similar to previous studies in this field, we use population density as a proxy for the size of social networks. Density, gender, year of entry to the labor force, job characteristics, household characteristics and characteristics of the area are used as explanatory variables. We also integrate age and level of education into our models and into the estimation of selection equations. Additional covariates for selection are: vocational training, marital status, number of children aged between 5 and 14 years in a household and interaction between gender and number of children under 5 years.
The probit model with sample selection assumes that there exists an underlying relationship

$$y_j^* = \mathrm{x}_j\ \beta + \mathrm{u}_{1j} \qquad [3] \quad \textbf{\textit{Latent equation}}$$

Such that we observe only the binary outcome:

$$y_j^{probit} = (\mathrm{y}_j^* > 0) \qquad [4] \textbf{\textit{Probit equation}}$$

[4]The Wald test is highly significant, indicating a good model fit. The likelihood-ratio test indicates that we can reject the null hypothesis that the errors for outcome and selection are uncorrelated. This means that we should use the probit with sample-selection model instead of the simple probit model. See Annex 3. Annex 1 defines the variables applied in the probit models.

[5]We further also corrected selectivity by probability of being economically active. The results are reported in Annex 2. In general, the results of the estimated models with different dependent variables of selections are comparable.

The dependent variable for observation j is observed if:

$$y_j^{select} = (z_j \gamma + u_{2j} > 0) \qquad [5]\textbf{\textit{Selection equation}}$$

Where : $u_1 \sim N(0,1)$ $U_2 \sim N(0,1)$ corr $(u_1,u_2) = \rho$

Looking at the results, *population density* as a measure of the size and strength of social contacts shows a small positive effect on the probability of finding a job, and only for the Algerian sample as a whole. In the case of Algeria, the probability of finding a job through social networks decreases with network size (in the denser areas). In areas where the population density is higher, relational networks become ineffective for people seeking for a job because the sharing of information about job vacancies is more extensive than in less dense areas. In Jordan this effect is insignificant. In the context of the youth in both countries, a greater size of social networks does not improve the probability of employment through friends and families. This means that networks approximated by local population density do not work for the population as a whole and may mainly work for minorities and immigrants. This finding also means that strong ties (closer family members, relatives and friends) are possibly more important than weak ties (population in adjacent areas) in information diffusion and spillovers.

To some degree, other reported results confirm the later conclusion. The *region* variable reveals similar interesting results in Table 4 (Models 1 and 2). Living in the most heavily populated areas, the capitals and their urban suburbs, decreases the probability of obtaining employment through social networks compared with the other methods. Typically, population in rural areas and small cities in most of the Arab world consists of big families and tribes and therefore have arguably better social contacts. Currently employed coming from the middle and southern areas of Algeria are significantly more likely to find a job using social contacts, regardless of age group. Likewise, compared to northern areas in Jordan, those living in middle areas; including Amman, have a lower probability of getting jobs using social networks. The same trend is observed for the southern part of the country, which is less populous than the north, however, with smaller magnitude than middle areas. Also *household wealth* emerges to intervene positively in the probability of

finding a job through social networks. This variable is overall significant in both countries except for the youth in Jordan. This probably suggests that the effectiveness of the network is also related to social background as represented by assets possessed by an individual's family. Further, when we include nationality of a worker into the estimation, which is available only for Jordan, it appears that Jordanian workers are less likely to find a job counting on social ties compared to non-Jordanian workers. This might capture the same effects found in the literature pertaining to the importance of kinship ties among foreign workers and immigrants in labor markets.

6.2. Additional results

A number of interesting aspects emerge from Table 4. In both countries, using social contacts do not appear to enable individuals to improve their chances of getting decent and formal jobs. This can be generally drawn from estimated coefficients related to the variables: affiliation to social security, legal sector, economic activity, firm size (for Algeria only), hourly wage (for Jordan only), and primary job requires any skill (for Jordan only). The analysis confirms that those utilizing social ties and contacts are more likely to obtain less secured private jobs in smaller in size firms. Such search methods also tend to match unemployed with jobs in some economic activities that traditionally characterized with higher risk of informality. This effect is maximum in construction activities in Jordan and trade activities in Algeria. Using the Jordanian data, our results are not supportive to the hypothesis that jobs found through friends and relatives require skills and augment wages. Relatively, particularly for Jordanian workers, the estimation suggests that the role of social networks as a key channel of finding a job improves with *age*. This may imply that as workers age they might accumulate more contacts or become more efficient in utilizing information coming from friends and relatives. Concerning the levels of education, the estimates indicate that those holding secondary education and less are more likely to find a job through social ties and contacts. This pattern tends to be more acute among youth in both countries. The inverse effect of education has been emphasized by the literature (for Arab countries, see Zenou and Wahba, 2005).

Table 4: Determinants of obtaining a job through social networks and ties

	Model 1				Model 2			
	Algeria		Jordan		Algeria		Jordan	
	Total	Youth	Total	Youth	Total	Youth	Total	Youth
Density	0.0448***	0.0277	0.0104	0.00747	0.0437***	0.0227	0.0158	0.0226
	(0.00938)	(0.0222)	(0.0537)	(0.0921)	(0.00946)	(0.0226)	(0.0538)	(0.0929)
Density Squared	-0.000991***	-0.000699	-4.39e-05	7.78e-05	-0.000943***	-0.000554	-5.44e-05	6.10e-05
	(0.000242)	(0.000576)	(0.000117)	(0.000198)	(0.000243)	(0.000586)	(0.000117)	(0.000199)
Demographic characteristics								
Gender (Ref: Female)	0.151**	-0.0876	0.105	0.0125	0.173**	0.00916	0.102	0.00941
Male	(0.0679)	(0.170)	(0.156)	(0.395)	(0.0683)	(0.174)	(0.159)	(0.402)
Age								
25-34 years	0.0716	-	0.172**	-	0.0699	-	0.166**	-
	(0.0437)		(0.0765)		(0.0439)		(0.0768)	
35 and more years	0.179***	-	0.314**	-	0.165***	-	0.311**	-
	(0.0557)		(0.147)		(0.0562)		(0.147)	
Human Capital (Ref: University)								
Without instruction	0.805***	0.458*	0.636***	0.354	0.801***	0.518**	0.596***	0.401
	(0.0615)	(0.255)	(0.212)	(0.471)	(0.0615)	(0.257)	(0.214)	(0.478)
Primary	0.652***	0.133	0.733***	0.674***	0.645***	0.167	0.729***	0.689***
	(0.0494)	(0.177)	(0.0993)	(0.237)	(0.0495)	(0.179)	(0.101)	(0.243)
Intermediate	0.680***	0.212	0.703***	0.536**	0.675***	0.245	0.670***	0.460*
	(0.0429)	(0.150)	(0.106)	(0.244)	(0.0429)	(0.151)	(0.107)	(0.249)
Secondary	0.439***	0.245*	0.269**	0.250	0.440***	0.283**	0.271**	0.276
	(0.0425)	(0.137)	(0.107)	(0.223)	(0.0426)	(0.139)	(0.108)	(0.225)
Year of entry to LF								
[2006 -2010]	0.153***	0.701*	0.196*	5.509	0.157***	0.708*	0.181	5.456
	(0.0444)	(0.376)	(0.110)	(283.9)	(0.0445)	(0.377)	(0.110)	(283.2)
[2001 -2005]	0.106**	0.710*	0.0670	5.545	0.111***	0.721*	0.0630	5.499
	(0.0427)	(0.377)	(0.0950)	(283.9)	(0.0428)	(0.379)	(0.0951)	(283.2)
[1996 -2000]	0.136***	0.897**	-0.00794	5.092	0.137***	0.881**	-0.0143	5.001
	(0.0383)	(0.392)	(0.0912)	(283.9)	(0.0384)	(0.393)	(0.0913)	(283.2)
Job characteristics								
Economic activity (ref:services)								
Agriculture	0.175***	0.156	0.350	0.243	0.170***	0.156	0.316	0.270
	(0.0515)	(0.110)	(0.226)	(0.336)	(0.0520)	(0.112)	(0.230)	(0.356)
Industry	0.215***	0.00998	0.129	0.126	0.259***	0.0486	0.149*	0.115
	(0.0366)	(0.103)	(0.0869)	(0.154)	(0.0374)	(0.105)	(0.0883)	(0.157)
Construction	0.0828**	-0.0533	0.211	0.764***	0.108***	-0.0173	0.209	0.721**
	(0.0374)	(0.0873)	(0.190)	(0.295)	(0.0380)	(0.0892)	(0.191)	(0.299)
Trade	0.335***	0.0739	0.228**	0.291*	0.323***	0.0306	0.229**	0.292*
	(0.0484)	(0.101)	(0.101)	(0.166)	(0.0490)	(0.104)	(0.101)	(0.168)
Affiliation to Social security (Ref:No)Yes	-0.183***	-0.187*	-0.401***	-0.443***	-0.0948**	-0.0221	-0.372***	-0.398***
	(0.0378)	(0.0973)	(0.0795)	(0.131)	(0.0417)	(0.105)	(0.0808)	(0.134)
Legal sector (Ref:Private)Public	-0.797***	-1.455***	-0.256***	-0.156	-0.714***	-1.237***	-0.250***	-0.128
	(0.0394)	(0.125)	(0.0795)	(0.155)	(0.0416)	(0.132)	(0.0807)	(0.159)
Size of enterprise (ref 250 or more)								
0 to 4 workers	-	-	-	-	0.343***	0.674***	-	-
					(0.0498)	(0.135)		
5 to 9 workers	-	-	-	-	0.429***	0.736***	-	-
					(0.0522)	(0.140)		
10 to 49 workers	-	-	-	-	0.182***	0.415***	-	-
					(0.0410)	(0.131)		
50 to 249 workers	-	-	-	-	0.206***	0.302**	-	-
					(0.0383)	(0.126)		
Looking for another job (Ref:No)Yes	-	-	-	-	-0.0316	-0.0819	-	-
					(0.0286)	(0.0622)		
Hourly Wage	-	-	-	-	-	-	-0.00522	-0.00531
							(0.00429)	(0.00650)
Primary job require any skill (Ref: No)Yes	-	-	-	-	-	-	-0.0982*	-0.0495
							(0.0585)	(0.107)
Nationality (Ref: others)Jordanian	-	-	-	-	-	-	-0.266**	-0.488***
							(0.121)	(0.187)

Table 4 (continued)

	Model 1				Model 2			
	Algeria		Jordan		Algeria		Jordan	
	Total	Youth	Total	Youth	Total	Youth	Total	Youth
Household Characteristics								
Household wealth	0.0637*** (0.0114)	0.165*** (0.0275)	0.0259** (0.0112)	-7.66e-05 (0.0188)	0.0644*** (0.0114)	0.170*** (0.0279)	0.0332*** (0.0115)	0.00819 (0.0192)
Number of unemployed in the household	-0.0177 (0.0238)	-0.0519 (0.0587)	-0.00181 (0.0514)	-0.0620 (0.0871)	-0.0190 (0.0238)	-0.0550 (0.0594)	0.000211 (0.0515)	-0.0652 (0.0878)
Characteristics of area								
Region (Ref: North)								
Middle (HautsPlateaux)	0.142*** (0.0326)	0.167** (0.0737)	-0.298*** (0.0770)	-0.486*** (0.137)	0.140*** (0.0328)	0.175** (0.0748)	-0.299*** (0.0773)	-0.481*** (0.138)
South	0.510*** (0.0461)	0.814*** (0.112)	-0.230* (0.118)	-0.484** (0.213)	0.497*** (0.0462)	0.786*** (0.113)	-0.213* (0.119)	-0.471** (0.215)
Unemployment rate at district level	-0.970*** (0.154)	-1.284*** (0.348)	0.0824 (0.758)	0.648 (1.501)	-0.895*** (0.156)	-1.106*** (0.355)	0.0296 (0.762)	0.552 (1.517)
Constant	-0.985*** (0.126)	-0.542 (0.543)	-0.904*** (0.239)	-6.072 (283.9)	-1.328*** (0.136)	-1.315** (0.576)	-0.645** (0.255)	-5.604 (283.2)
Selection equation								
Age	0.349*** (0.00464)	-	0.366*** (0.0556)	-	0.349*** (0.00464)	-	0.366*** (0.0556)	-
Age square	-0.00434*** (5.97e-05)	-	-0.00565*** (0.00105)	-	-0.00434*** (5.97e-05)	-	-0.00566*** (0.00105)	-
Marital status (Ref: Others) Married	0.114*** (0.0275)	0.0857 (0.0915)	-0.559*** (0.0715)	-0.508*** (0.125)	0.115*** (0.0275)	0.0962 (0.0922)	-0.559*** (0.0715)	-0.506*** (0.125)
Without instruction	-0.820*** (0.0325)	0.200* (0.104)	-1.866*** (0.157)	-1.680*** (0.276)	-0.820*** (0.0325)	0.201* (0.104)	-1.865*** (0.157)	-1.678*** (0.276)
Primary	-0.490*** (0.0294)	0.847*** (0.0557)	-1.402*** (0.0747)	-1.191*** (0.127)	-0.490*** (0.0294)	0.848*** (0.0557)	-1.403*** (0.0747)	-1.192*** (0.127)
Intermediate	-0.318*** (0.0259)	0.455*** (0.0434)	-1.332*** (0.0882)	-1.072*** (0.151)	-0.318*** (0.0259)	0.455*** (0.0434)	-1.331*** (0.0882)	-1.070*** (0.151)
Secondary	-0.374*** (0.0277)	0.0234 (0.0471)	-0.410*** (0.0961)	0.0905 (0.187)	-0.374*** (0.0277)	0.0234 (0.0471)	-0.410*** (0.0961)	0.0909 (0.187)
Vocational training (Ref:No)	0.513*** (0.0230)	0.613*** (0.0362)	0.125* (0.0739)	0.142 (0.117)	0.513*** (0.0230)	0.613*** (0.0362)	0.122* (0.0740)	0.138 (0.118)
Number of people 5 – 14 years in the household	-0.0358*** (0.00792)	-0.0923*** (0.0133)	-0.0599*** (0.0216)	-0.0483 (0.0330)	-0.0357*** (0.00792)	-0.0919*** (0.0133)	-0.0599*** (0.0216)	-0.0479 (0.0330)
1.sexe	-2.002*** (0.0209)	-1.324*** (0.0352)	2.239*** (0.0710)	2.211*** (0.101)	-2.002*** (0.0209)	-1.324*** (0.0352)	2.238*** (0.0710)	2.208*** (0.101)
Children under 5 years in the household	0.152*** (0.0164)	-0.0443 (0.0271)	-0.183*** (0.0387)	-0.0786 (0.0750)	0.152*** (0.0164)	-0.0448* (0.0271)	-0.184*** (0.0387)	-0.0780 (0.0749)
Gnder#c.Number of children under 5 years in the household	-0.453*** (0.0254)	-0.222*** (0.0633)	0.499*** (0.0595)	0.187* (0.0997)	-0.453*** (0.0254)	-0.219*** (0.0633)	0.499*** (0.0595)	0.186* (0.0998)
Constant	-5.360*** (0.0920)	-0.833*** (0.101)	-5.024*** (0.734)	-0.0625 (0.113)	-5.361*** (0.0920)	-0.844*** (0.101)	-5.027*** (0.734)	-0.0630 (0.113)
Sample size	**46358**	**15740**	**5160**	**1852**	**46355**	**15739**	**5154**	**1847**

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Finally, the probability of obtaining employment through social contacts emerges to be significantly influenced by short term conditions prevailing in labor markets. To investigate this possibility, our models divide

employed respondents according to the year of their entry to the labor market. Specifically, for Algeria, the likelihood of getting employed through social networks varies significantly from one period to another. This result may be largely driven by fluctuations in business cycles in the short run. In Jordan, the positive effects of this variable turn out significant only at the level of 10% for the whole sample in one of our models, and only for those who have entered the labor market during the period (2006-2010). The latter finding, which is also evident for Algeria, may partly reflect the effects of the global financial crisis that had hit the world economy during that period. In such an environment, job seekers may find it more difficult to find a job through formal challenges and therefore increase their reliance on social ties.

7. Conclusions and policy implications

This study is one of few attempts that handle the role of social ties in the Arab labor markets, particularly in Jordan and Algeria. It shows that labor market information and referrals obtained through friends and relatives emerge crucial in searching for and finding jobs in both countries. Our results indicate that nearly 83% and 64% of Algerian and Jordanian job seekers, respectively, rely on friends and relatives. Female jobseekers in both countries, particularly in Jordan, are less likely to use these informal channels compared to males irrespective of age. While using *Government employment offices* method in looking for a job is common among female job seekers, it tends to be much less popular than using friends and relatives among unemployed youth and adult males in both countries. Concerning the effectiveness of social networks in helping unemployed find a job, they *comparatively* prove to be the most, or among the most, effective job-search channels as reported by employed themselves.

We further use binary probit models to investigate determinants of the probability of finding a job through social networks. The models show interesting results. First, population density as a measure of the size and strength of social contacts has only a small positive effect on the probability of finding a job, and only for the Algerian sample as a whole. For all Jordanian workers, including youth, and youth in Algeria this effect is insignificant, as a greater size of social networks does not improve the probability of employment through friends and families. Also, the study shows positive effects of household wealth. In Jordan,

foreign workers are more likely to benefit from social networks in gaining employment. These findings suggest that networks approximated by regional population density may mainly work for minorities and immigrants not for the population as a whole, particularly youth. They may also imply that strong ties (e.g. closer relatives and friends, and friendship relationships on social media) are more important than weak ties (population in adjacent areas) in information diffusion and spillovers. The empirical findings indicate that higher levels of education, particularly among youth in both countries, lead to less reliance on social contacts in attaining jobs. On the other, gender is found to be significant only for Algerian data, as males appear to be more likely to gain from social networks in finding a job compared with their female counterparts. However, relative to other methods, the use of social networks appears evidently to increase the probability of obtaining jobs characterized with poorer quality.

Policy makers must seek effective policy formulation processes that facilitate non-discriminatory employment. In general, national employment policies and strategies should take into account the impact of social networks on employment and labor market participation. More investment in education and training, particularly in remote areas may enhance the efficiency of job search and equity of opportunities offered by labor markets. The findings of the study show also that despite the importance of public sector agencies in job search process, less than 5% of employed youth in Algeria and 9% in Jordan state that such agencies have helped them transit into employment. This confirms the idea that the performance of public agencies in charge of employment services in the Arab region is not adequate and largely underdeveloped. In effect, policy makers are advised to pay more attention to boosting the effectiveness of public agencies. The data shown in the current study provides suggestive evidence that the society, and possibly private sector employers, favor males over female jobseekers in employing referrals from friends and relatives. Arab women have very low labor market participation and unemployment among youth females amounts to high levels. This is coupled with the fact that women are more educated and that they prefer public sector jobs. Job search difficulties may have contributed to limiting labor market opportunities available to females in both countries and may partly explain why they have lower participation rates.

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ANNEX 1: Definition of variables

Variables	**Definition**
Social network	
Density	Number of people per square kilometer by governorate
Density Squared	Density square
Demographic Characteristics	
Gender	dummy = 1 if female
Marital status	dummy = 1 if married
Age	Age of the individual
Age squared	Age of the individual squared
Human capital (ref university)	
Without education	dummy = 1 if without education
Primary	dummy = 1 if education level primary
Intermediate	dummy = 1 if education level Intermediate
Secondary	dummy = 1 if education level Secondary
Vocational training	dummy = 1if the person has followed vocational training
Year of entry to labor force(ref :before 1996)	
[2006 -2010]	dummy = 1 if the employee was recruited between 2006 and 2010
[2001 -2005]	dummy = 1 if the employee was recruited between 2001 and 2005
[1996 -2000]	dummy = 1 if the employee was recruited between 1996 and 2000
Work experience	Dummy = 1 if the person has worked in the past
Job characteristics	
Legal sector (ref : public)	dummy = 1 if private sector
Affiliation to the social security(ref : affiliated)	dummy = 1 if the employee is not affiliated at the social security fund
Looking for another job(ref : non)	dummy = 1 if the employee is not seeking for another job
Hourly Wage	Hourly wage
Primary job require any skill	Dummy = 1 if job require skill
Economic activity (ref :services sector))	
Industry	dummy = 1 if industry sector
Construction	dummy = 1 if construction sector
Trade	dummy = 1 if trade sector
Agriculture	dummy = 1 if services sector
Firm size (ref 250 or more)	
0 to 4 workers	dummy = 1 if establishment size is between 0 and 4 employees
5 to 9 workers	dummy = 1 if establishment size is between 5 and 9 employees
10 to 49 workers	dummy = 1 if establishment size is between 10 and 49 employees
50 to 249 workers	dummy = 1 if establishment size is between 50 and 249 employees

Nationality (ref: others)	Dummy = 1 if Jordanian
Household Characteristics	
Household wealth	Composite index of household assets
Children under 5 years	Number of children under 5 years in the household
Number of people 5 – 14 years	Number of children aged between 5 and 14 years in the household
Number of employed in the household	the respondent is not recognized if it is in this status
Number of unemployed in the household	the respondent is not recognized if it is in this status
Characteristic of the area	
Geographic areas (ref: North)	
Middle	dummy = 1 if Middle governorate
South	dummy = 1 if South governorate
Local unemployment rate	percentage of unemployed in the workforce at the district of residence
Urbanization rate by governorate	percentage of population living in urban areas by governorate

Annex 2: Determinants of getting a job through relatives and Friends-Selection [Employment vs Unemployment]

	Algeria		**Jordan**	
	Total	**Youth**	**Total**	**Youth**
Density	0.0467***	0.0215	0.00988	0.00926
	(0.00950)	(0.0224)	(0.0533)	(0.0876)
Density square	-0.00103***	-0.000505	-4.18e-05	6.84e-05
	(0.000245)	(0.000580)	(0.000116)	(0.000189)
Demographic characteristics				
Gender (Ref: Female) Male	0.0898**	-0.00987	0.173*	-0.320
	(0.0457)	(0.115)	(0.0979)	(0.216)
Age				
25-34 years	0.0500	-	0.210**	-
	(0.0443)		(0.0849)	
35 and more years	0.138**	-	0.361**	-
	(0.0670)		(0.154)	
Human Capital (Ref: University)				
Without instruction	0.839***	0.423*	0.588***	0.432
	(0.0561)	(0.256)	(0.202)	(0.393)
Primary	0.656***	0.191	0.718***	0.616***
	(0.0481)	(0.149)	(0.0875)	(0.233)
Intermediate	0.688***	0.258*	0.694***	0.448*
	(0.0429)	(0.136)	(0.0961)	(0.260)
Secondary	0.439***	0.201	0.268**	0.124
	(0.0435)	(0.144)	(0.106)	(0.256)
Year of entry to labor force (ref :before 1996				
[2006 -2010]	0.156***	0.677*	0.157	5.632
	(0.0468)	(0.365)	(0.116)	(703.2)
[2001 -2005]	0.0952**	0.669*	0.0445	5.658
	(0.0438)	(0.367)	(0.0967)	(703.2)
[1996 -2000]	0.137***	0.865**	-0.0174	5.215
	(0.0387)	(0.382)	(0.0908)	(703.2)
Job characteristics				
Economic activity (ref:services)				
Agriculture	0.214***	0.163	0.331	0.244
	(0.0527)	(0.111)	(0.223)	(0.316)
Industry	0.215***	0.0219	0.127	0.122
	(0.0367)	(0.101)	(0.0863)	(0.146)
Construction	0.0894**	-0.0683	0.209	0.723**
	(0.0378)	(0.0859)	(0.189)	(0.290)
Trade	0.337***	0.0621	0.227**	0.266*
	(0.0488)	(0.100)	(0.0999)	(0.160)

Affiliation to Social security (Ref:Yes) No	-0.193*** (0.0382)	-0.188* (0.0959)	-0.392*** (0.0799)	-0.426*** (0.131)
Legal sector (Ref: Public) Private	-0.791*** (0.0396)	-1.407*** (0.137)	-0.252*** (0.0791)	-0.150 (0.148)
Household Characteristics				
Household wealth	0.0601*** (0.0115)	0.162*** (0.0277)	0.0262** (0.0111)	0.000121 (0.0179)
Characteristics of area				
Region (Ref: North)				
Middle (HautsPlateaux)	0.133*** (0.0327)	0.144** (0.0724)	-0.295*** (0.0766)	-0.458*** (0.137)
South	0.500*** (0.0463)	0.769*** (0.114)	-0.226* (0.117)	-0.455** (0.207)
Unemployment rate at district level	-0.918*** (0.157)	-1.196*** (0.366)	0.0254 (0.745)	0.643 (1.393)
Constant	-0.875*** (0.126)	-0.620 (0.458)	-1.020*** (0.237)	-5.591 (703.2)
Selection equation				
Age	0.100*** (0.00799)	-	0.180*** (0.0602)	-
Age square	-0.000965*** (0.000111)	-	-0.00194* (0.00116)	-
Marital status (Ref: Others) Married	-0.570*** (0.0417)	-0.823*** (0.209)	0.169* (0.0906)	0.222 (0.157)

Annex 2 (continues): Determinants of getting a job through relatives and friends-Selection [Employment vs Unemployment]

	Algeria		**Jordan**	
	Total	**Youth**	**Total**	**Youth**
Human Capital (Ref: without instruction)				
Intermediate	0.166***	0.139	0.485***	0.512*
	(0.0578)	(0.172)	(0.180)	(0.290)
Secondary	0.308***	0.315*	0.426**	0.463
	(0.0603)	(0.177)	(0.186)	(0.305)
University	0.137**	-0.0397	0.359**	0.0190
	(0.0614)	(0.183)	(0.175)	(0.289)
Vocational training (Ref:No)	0.0197	0.00730	-0.105	-0.186*
	(0.0300)	(0.0492)	(0.0733)	(0.102)
Number of unemployed in the household	-0.259***	-0.317***	-0.220***	-0.258***
	(0.0198)	(0.0359)	(0.0414)	(0.0581)
Number of employed in the household	0.0727***	0.109***	0.0692***	0.0494
	(0.0106)	(0.0186)	(0.0244)	(0.0360)
Number of people 5 – 14 years in the household	0.00973	0.00258	-0.0151	-0.0478
	(0.0123)	(0.0201)	(0.0247)	(0.0315)
1.sexe	-0.464***	-0.497***	0.770***	0.683***
	(0.0354)	(0.0681)	(0.0748)	(0.114)
Children under 5 years in the household	-0.0474**	-0.0805**	0.00656	0.0304
	(0.0199)	(0.0382)	(0.0595)	(0.109)
Gnder#c.Number of children under 5 years in the household	-0.150***	-0.252**	0.0505	0.00614
	(0.0425)	(0.108)	(0.0644)	(0.122)
Constant	-0.920***	1.042***	-3.477***	-0.284
	(0.153)	(0.262)	(0.785)	(0.305)
Sample size	**17764**	**4067**	**3440**	**1307**

ANNEX 3: Quality of models

		Social networks	**Social Networks (extended model)**	
	Test Wald	LR test of indep. Eqns. (rho = 0)	Test Wald	LR test of indep. Eqns. (rho = 0)
		Jordan		
Total	Chi2 (24) = 358.76 Prob> Chi2 = 0	Chi2(1)=9.33 Prob>chi2 = 0.0021	Chi2 (27) = 366.57 Prob> Chi2 = 0	Chi2(1)=7.22 Prob>chi2 = 0.0044
Youth	Chi2 (22) = 139.45 Prob> Chi2 = 0	Chi2(1)=13,31 Prob>chi2 = 0	Chi2(25)=145.58 Prob>chi2 = 0	Chi2(1)=6.24 Prob>chi2 = 0.0067
		Algeria		
Total	Chi2 (24) = 2939.45 Prob> Chi2 = 0	Chi2(1)=11,62 Prob>chi2 = 0	Chi2(29)=2990.06 Prob>chi2 = 0	Chi2(1)=14,71 Prob>chi2 = 0
Youth	Chi2 (22) = 542.62 Prob> Chi2 = 0	Chi2(1)=10,53 Prob>chi2 = 0	Chi2(26)=557.71 Prob>chi2 = 0	Chi2(1)=9.87 Prob>chi2 = 0