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Network Social Capital and Labour Market Outcomes: Evidence For Ireland

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Abstract: Using data from the *International Social Survey Programme 2008* this paper tests empirically the effects of network social capital on Irish employment outcomes, while attempting to account for possible endogeneity. We allow the effects of social networks to vary for different groups and across different localities. We find that an individual's "weak ties" or acquaintances matter for employment outcomes, whereas their "strong ties", for example, their friends and family, are less important. The effects, however, vary across age and location. We also find no evidence that the relationship between social participation and employment is endogenous. These findings are discussed with relevance for future research and policy.

I INTRODUCTION

This paper analyses the extent to which a person's social network and particularly their investment in weak ties, or ties with acquaintances, impacts on their chances of being in employment in an Irish context. First, we outline for the reader the ways in which social participation may lead to improved employment outcomes. We then test empirically whether people with higher levels of social participation are more likely to be in employment whilst attempting to control for possible endogeneity.

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The approach adopted by this paper is empirical in nature. Using data from the *International Social Survey Programme 2008* (ISSP) for Ireland this paper estimates a number of models of the relationship between social capital and employment outcomes. We test the hypothesis that weak ties (or ties to acquaintances) are more important for individual's labour market outcomes than strong ties (or ties to close friends and family) when it comes to the Irish labour market. In the absence of a direct measure of the quality of an individual's social ties we allow the effects of social networks to differ across different groups and localities. In our final section, we discuss the relevance of our findings to Ireland's unemployment problem while acknowledging the limitations of the study.

Our paper is based on a commonly held premise that people can "get ahead" in the labour market not only through education but also through knowing the right people. When it comes to social capital Woolcock and Narayan (2000) note that the commonly heard aphorism that "it's not what you know, it's who you know" sums up the most basic understanding people have of the concept. This is closely related to Coleman's (1988) concept of the appropriability of social structure whereby people can use social ties developed for one purpose to forward another.

From an economic perspective this suggests that the type, frequency and quality of a person's social contacts can convey some economic advantage to the individual. Individuals with access to "better" social networks may be in an improved position to leverage social contacts and to gain access to opportunities and information which would otherwise be unattainable. There is growing evidence that the type of social capital embodied by social networks can result in improved labour market outcomes (Granovetter, 1973; Mouw, 2003, Aguilera, 2002). Indeed, in a tight labour market the advantages gained through social networks may be an important determining factor in an individual's chances of finding employment.

This paper contributes to the existing literature on employment outcomes in Ireland in two ways. First, despite recent years resulting in a growing number of studies on Ireland's labour market (O'Connell *et al.*, 2013) no previous study has explicitly considered the effect of social networks on Irish labour market outcomes. This is a considerable gap in the literature given that international surveys have suggested that people are more likely to receive their information about jobs from relatives (17.5 per cent), friends (12.8 per cent) and acquaintances (14.7 per cent) than either public (6.8 per cent) or private (2 per cent) employment agencies (ISSP, 2001). Indeed there is some evidence of the importance of informal networks in Irish job search with the *2012 European Quality of Life Survey* (Eurofound, 2013) showing that 45.5 per cent of Irish people, when asked the question "from whom would you get

support if you needed help when looking for a job?", indicated that they would ask people within their social network first, compared to 38.4 per cent indicating they would go to service providers or formal institutions.

Second, this paper progresses to analyse not only whether social networks affect employment outcomes but whether the impact of these networks varies between different population groups. This progresses the analysis beyond looking simply at the question; do social networks matter and on to the question of for whom do they matter and why? From this we discuss implications for our understanding of the Irish labour market and future research.

The remainder of this paper is structured as follows. Section II presents an overview of the literature in this area and our hypotheses regarding the links between social networks and people's employment outcomes which are tested in this paper. Section III presents the methodology utilised by this paper. Section IV discusses the data used in this paper and looks at the presence of social networks across various groups. In Section V the results of the econometric analysis are presented. Finally, in Section VI we present the conclusions of our findings, discuss the strengths and weaknesses of our approach and the questions our results leave for future research.

II NETWORK SOCIAL CAPITAL AND THE LABOUR MARKET

Social capital is a multifaceted concept which has been the subject of much study, following from the seminal contributions of Bourdieu (1986), Coleman (1988), Putnam (1995) and Lin (1999). Numerous competing theories of social capital have been set forward (Woolcock and Narayan, 2000), of which there is no settled consensus. The one underlying feature of this social capital research is that it recognises the fact that social ties developed for one purpose (for example friendship) often have other uses, many of which are economic in nature (Adler and Kwon, 2002).

Despite its roots in social networks social capital is also commonly equated with collective goods such as trust, norms, and other shared values. Lin (1999, p.33) criticises this formulation of social capital as "… divorced from its roots in individual interactions and networking". He goes on to argue that trust norms and other collective goods may be related to social capital but the two concepts should not be seen as substitutable.

We utilise a "network view" (Woolcock and Narayan, 2000) of social capital to present the hypothesis that the type and extent of an individual's social network will affect their labour market outcomes. The advantage of this approach over others is that it focuses on the social capital as a relational good

rather than its causes or effects and allows us to regard the potential effects of social capital as both positive and negative (Woolcock and Narayan, 2000). This use of social networks and relations as a measure of social capital (Portes, 1998; Lin, 1999; Burt, 1992; Bourdieu, 1986) is closer to the definition of network social capital as: "resources embedded in a social structure which are accessed and/or mobilised in purposive actions" (Lin, 1999).

The study of social capital in the labour market has stressed the advantages which individuals can derive from these networks (Montgomery, 1991, Beugelsdijk and Smulders, 2003). Indeed, there is strong evidence that the type of social capital embodied by social networks can result in improved labour market outcomes (Granovetter, 1973; Montgomery, 1991; Mouw, 2003, Aguilera, 2002). This network approach to labour market outcomes has been expanded on in economic literature by Calvó-Armengol and Jackson (2004) who construct formal network models of employment showing strong correlation between network links and labour market outcomes.

The literature on network social capital in job search models has identified a number of key mechanisms through which these social networks can lead to improved labour market outcomes. These can be broadly categorised into "information, influence and social credentials" Lin (1999, p. 31).

First, social networks allow individuals access and share information. The better developed, in scope and in quality, an individual's network is the better the quality of information they can obtain. Indeed, employers are also likely to gain information on available employees through social ties. In imperfect markets, information gained through social ties may reduce search costs for recruiting organisations and for individuals searching for employment. The use of social networks in job search is amplified by the fact that finding jobs through pre-existing social ties is less costly than other job search techniques. This is because people maintain and develop these ties in most circumstances for non-economic reasons (Granovetter, 2005).

When it comes to social ties, however, not all ties are necessarily equal. Recognising this is one of the key theoretical findings in the importance of social networks to the labour market developed from Grannovetter's (1973) "strength of weak ties" paper. Granovetter showed that individuals were more likely to gain novel information from weak ties or acquaintances than their strong ties, for example their friends or family (Granovetter, 1973). People's "strong ties" tend to congregate in the same social circles as them. The new information an individual can gain from those ties, will, therefore, be limited. Weak ties on the other hand will have access to information which an individual may not have through his/her own close social network thus presenting new information about employment opportunities to the individual.

Burt (1992) presented a variation on the "weak ties" argument. His argument was that it was not the ties "quality" that mattered but the way in which an individual's ties may allow them to exploit a "structural hole" between networks. In effect, new ties may act as a "bridge" between one network and their own. An individual may gain some informational advantages from developing ties in multiple separate networks.

Additionally, individuals with high "quality" ties may be able to exert influence by disseminating information through their social ties. Social networks, may also allow people to develop social credential within a network. For example, employers often look for referrals from people within an applicant's social network (Montgomery, 1991). If an individual shows good character then information on this may be disseminated to employers through social ties. In this way employers may use social networks to screen job applicants. Job-seekers who have developed strong social networks may be both more likely to gain new information from these social networks but also have a reputational advantage over others with less developed social ties. In this way employers can overcome information asymmetries about the character of prospective employees. These can have a big influence on an individual's chances of finding employment.

H1 – A person's investment in weak social ties will influence their labour market outcomes positively.

The data used in this study provides an indicator for individuals' investment in these social networks but not necessarily the quality of those networks as used in popular position generator approaches (Lin *et al.*, 2001). This disadvantage may be overcome to an extent by observing the variation in social capital and its effects across social groups with the assumption that access to and quality of social networks is heterogeneous across social groups. In other words, we test the hypothesis that positive labour market externalities arising out of individuals' investment in social ties may vary depending on the individuals' social or even geographical location. Granovetter (2005) argues that the uneven distribution of ties among individuals means that the labour market is an uneven playing field by virtue of the non-economic social structure in which the labour market is embedded. For example, Lindsay *et al.* (2003) show that young rural dwellers' disadvantage in terms of social networks allied to the prevelance of informal job search methods in rural areas, results in barriers to employment for these job seekers.

People's social networks may also have a more malignant effect. Woolcock and Narayan (2000) illustrate this best with the example of a parent wondering about their children falling in with the "wrong crowd". Although

the "wrong crowd" may not be seen as desirable, they remain social networks in the same manner as any other group. Calvó-Armengol *et al.,* (2007) have presented a formal model showing that an individual's propensity to participate in criminal activity may be affected by criminal activity in their social network or area. In addition, the literature has identified links between strong local bonds and low levels of labour mobility (David *et al.*, 2010). People with strong familial or friendship supports and ties in an area may be less willing to move to find work, particularly to areas where they have little or no ties. Thus, not all social ties will have positive externalities for the individual. This leads us to our first hypothesis.

H2 – The extent to which a person's weak labour market ties will influence their labour market outcomes will vary depending on an individual's social location.

III METHODOLOGY

In order to assess the effect of individual's social networks on their employment prospects we employed a two part strategy. In our first step, we run a probit analysis Equation (1) to assess the association between social participation and the probability of being in employment either full or part time. When estimating this model we control for levels of education, socio-economic characteristics, familial background and other personal characteristics such as age and gender.

A simple representation of our baseline model is presented in Equation (1):

$$E_i = \alpha_0 + \beta WT_i + \vartheta ST_i + \delta HC_i + \sigma Z_i + \varepsilon_i \quad (1)$$

Where E is a binary indicator of individual *i's* labour market outcome reflecting whether they are employed or not, WT_i is a measure of individual *i's* participation in social activities which may give rise to weak ties, ST_i represents the frequency with which an individual fraternises with strong ties such as family and friends, HC_i is a measure of individual i's human capital attainment, Z_i is a vector of control variables and ε is the error term.

The probability a person will be in employment is written as:

$$P_i = PROB\ EO_i = 1 = \varnothing(\alpha_0 + \beta WT_i + \vartheta ST_i + \delta HC_i + \sigma Z_i + \varepsilon_i) \quad (2)$$

Where $\varnothing(.)$ is the normal distribution function. The vectors of the parameters above are estimated by the maximum likelihood methods under the assumption that the residual term ε is uncorrelated with the exogenous variables.

An important implicit assumption we make when estimating Equation (1) is that *WT* participation in social activities is exogenously determined. One of the issues which may be raised in our analysis is the possibility that participation in social networks is simultaneously determined with employment outcomes (due to time constraints) or some unobserved factors impacting on both. Where this is a possibility, estimating Equation (1) using a simple probit model may result in inconsistent parameter estimates.

To account for this possible biased endogeneity we estimate an instrumental variables bivariate probit regression of Equations (3) and (4) (Greene, 2008):

$$E_i = \alpha_1 + \beta WT_i + \sigma Z_i + \varepsilon_i \tag{3}$$

$$WT_i = \alpha_2 + \mu Ins_i + \sigma Z_i + \tau_i \tag{4}$$

As previously, the employment status (E) of individual i depends on his/her social participation and a vector of other independent variables. The weak ties of individual i is determined by the same covariates but also by an instrumental variable *Ins*. We use levels of generalised trust in others as our instrument in line with Narayan and Pritchett (2000). Our assumption is that trust has a positive effect on an individual's participation in social groups, but only effects employment outcomes through the development of social networks. To test the instrument validity, we perform a bivariate estimation of Equations (3) and (4) with trust in both sides and a t-test to assess if a generalised trust is not associated with employment outcomes but strongly associated with social participation (Greene, 2008).

The simultaneous estimation of Equations (3) and (4) is also more efficient than the alternative approach (Greene, 2008) which, would involve substituting predicted values from Equation (2) for *WT* in Equation (1), as the bivariate approach takes account of the potential correlation between the disturbances of the two regressions.

Additionally, the likelihood ratio (LR) test reported in the bivariate approach can be used to test the hypothesis that *WT* is endogenous. Knapp and Seaks (1998) have shown that a likelihood ratio (LR) test of the null hypothesis that the correlation coefficient of the error terms ε and τ is zero is equivalent to a Hausman endogeneity test. An insignificant sign on this test would signify endogeneity is not present and that it is appropriate to report the results of the probit estimation of Equation (1) (Rowell, and Connelly, 2010).

In an additional step to test the endogeneity hypothesis we perform an augmented regression test by including the residuals of our potentially endogenous covariate, as a function of all exogenous variables, in a regression

of the original model. A significant sign on the residual would suggest an endogenous relationship. Again, if our coefficients signifying endogeneity are not statistically significant it is appropriate to report our probit estimation of Equation (1) only, as using instrumental variable estimates when they are not necessary can create more problems than they solve (Bound, Jaeger and Baker 1995).

Finally, we recognise that while social networks may impact on an individual's employment outcomes it may not have the same affect on different groups. To test this we add a number of interaction variables to our model. In order to account for issues surrounding the interpretation of interaction terms in non-linear models we compute our interaction effects using Ai and Norton's (2003) Inteff programme for Stata 12 which reports the interaction effects and z-statistic for each individual observation separately. This is described in more detail in Section V.

IV DATA

The data used in this paper is taken from the 2007 ISSP (International Social Survey Programme) which is available through ZACAT the GESIS online archive provided by the Leibniz Institute for the Social Sciences. The 2007 ISSP focused on leisure time and sports activities and contains information from more than 50,000 individuals across 36 countries internationally. The data for Ireland was collected using face to face interviews between August and the end of October 2008, yielding 2,049 respondents. A unique sample was selected using the Economic and Social Research Institute's (ESRI) random sampling system *RANSAM* and comprised a purposive selection of 140 district electoral divisions.

Table 1 displays a summary of the variables and measures utilised by this paper. First, our dependent variable is binary indicating whether the respondent is employed or not. There has been some discussion in the literature as to whether those in unemployment and outside the labour force should be treated as two distinct labour market states in terms of labour market analysis.

Movements into and out of the labour force dominate movements between unemployment and employment throughout the business cycle (Clark and Summers, 1979). Poterba and Summers (1995) and Clark and Summers (1979) analysing this dynamic view of labour force transitions find that the differences between unemployment and inactivity are weak particularly for certain groups, causing large classification errors in some labour market surveys. To account for these issues we do not fully distinguish between those who are unemployed and those out of the labour force as our data does not

contain any clear indicator of the level of job search an individual is undertaking. As a result it is impossible to discern weak labour force attachment to no attachment among those outside the labour force.

Flinn and Heckman (1983), however, suggest that the behaviour of individuals who are inactive because they are disabled, retired or otherwise unable to work differs from other groups of unemployed or inactive. For the purpose of our study individuals in the sample who are retired, still in education or who have identified as unable to work due to a disability were excluded from the sample.[1] Control variables used in the study include demographics and education variables, variables indicating the degree of urbanisation in the area where *h* the respondent resides and finally the household composition of the respondent.

This paper uses measures of individual investment in social networks and relations to assess the impact of social capital on labour market outcomes. For our main independent variables we use two proxy measures of weak ties and one indicating strong ties.

Respondents in the ISSP are asked five individual questions relating to their participation in a five different types of social groups. These groups are (1) sports, (2) cultural, (3) church/religious, (4) community service/civic association and (5) political groups. Question 1 below is asked of each of the above groups individually:

Q1: In the last 12 months, how often have you participated in the activities of one of the following associations or groups?

Respondents are given a choice of five answers ranging from once or twice a week to never.

From this we construct two proxy measures of weak social ties. The first is a binary variable where an individual indicates they have taken part in at least one of the above groups once or twice a year or more. This effectively measures whether the individuals have partaken in a social group where they are likely to have developed weak social ties.

The second indicates the number of groups in which the individual has participated calculated by summing the five binary variables, which indicate participation in the different types of clubs or associations. These proxies are used to measure our primary hypothesis, that participation in these social groups increases people's chances of being in employment. Testing the impact of different types of social groups or different patterns of interaction goes outside the primary purpose of this paper but may be an avenue for future research.

[1] This results in the loss of 657 observations relating to people who are retired, in education or out of work due to a disability from our sample. 32 per cent of the original sample.

Our measure of strong ties is based on the question which asks how often the respondent spends time with friends or family. From this categorical indictor, ranging from once or twice a week or more to never, we construct a binary variable indicating whether a person spends time with friends or family on a weekly basis or less often. A full description of the other variables used in the paper is contained in Table 1.

Table 1 : *Measures of Variables Used*

Variable	*Measure*
Employment Status	Binary measure of employment where 1 = employed either full or part time.
Demographic Characteristics	
Gender	Binary indicator 1 = Male 0 = Female
Age	Age in years
Years of education	Years the individual has spent in education
Location	
Urban, a big city	Binary indicator of where the individuals reside. 1 = Urban, a big city
Suburb, outskirts of a big city	1 = Suburb, outskirt of a big city
Town or small city	1 = Town or small city
Country village	1 = Country Village
Farm or rural property	1 = Farm or rural property
Household Composition	
More than one adult	Binary indicator. Household has one child or more and with children two adults or more.
Single parent	Binary indicator. Household has one child or more and only one adult.

When it comes to our main variable of interest, of our proxy for weak ties, 56 per cent of our sample partakes in one of the outlined social activities. This participation is higher in sports groups than in any other group, with 36 per cent of the sample participating in the activities of a sporting group. The least common form of social participation is in political groups with only 7.5 per cent of the total sample participating in these groups. When it comes to strong ties 44 per cent of our sample meet with friends once a week or more, compared to only 21 per cent with family. This is not unexpected; however, as individuals may be less likely to live in close geographical proximity to relatives than friends in many cases. Overall, 49 per cent of our sample spends time with either family or friends in a given week.

Our sample is representative of the overall population with calibration to population totals by age group, sex, household size, level of education and region. Additionally, our measure of employment is representative broadly of adults of working age who are not retired, in school, disabled, or otherwise unable to work.

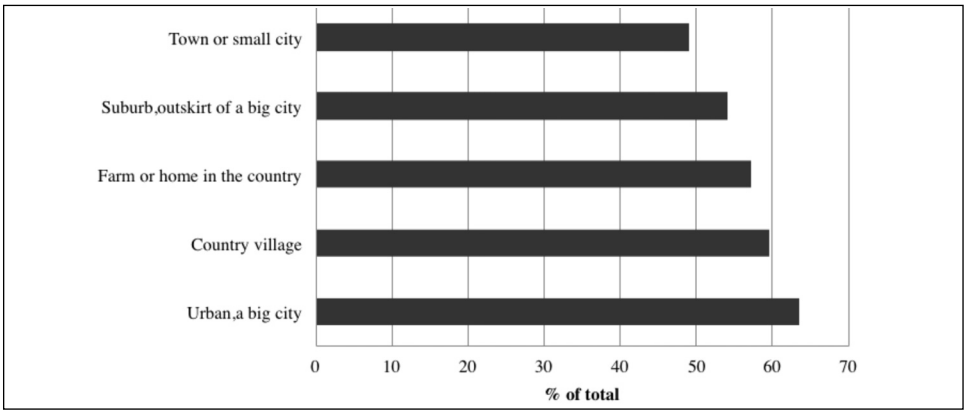
Table 2: *Descriptive Statistics*

Variable	*Mean Value (%)*	*Standard Deviation*
Employment Status		
Employed	75.9	–
Unemployed	24.05	–
Demographic Characteristics		
Gender: Male	41.06	–
Gender Female	58.94	–
Age	41.6	12.56
Years of education	13.66	3.98
Location		
Urban, a big city	13.78	–
Suburb, outskirts of a big city	17.66	–
Town or small city	23.98	–
Country village	20.96	–
Farm or rural property	23.62	–
Household Composition		
More than one adult with children	41.13	–
Single parent	5	–
Other	53.87	–
Weak Ties		
Sports	36.4	–
Cultural	25.05	–
Religious	28	–
Community/Civic	27.06	–
Political	7.54	–
At least one of the above	56.07	–
Strong Ties		
Friends	43.58	–
Family	21.39	–
One of the above	49.46	–

From Figure 1 we can see that participation in social groups and organisations is highest among people in large cities where opportunities to participate may be greater due to greater numbers of these groups and ease of transport. Interestingly, however, people in rural areas and villages are more likely than those in towns and suburbs to participate in social groups.

This may well represent stronger community ties in more established rural areas compared to suburban areas with less developed ties.

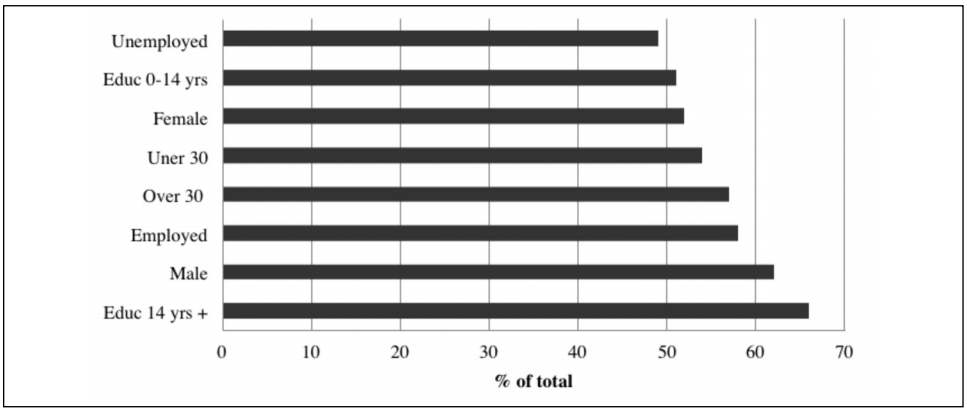
Figure 1: *Social Participation by Location*



Participation in social groups also varies across demographic groups. Participation in these social groups is 10 percentage points higher among males than females. People with more than 14 years full time education are also much more likely to participate in these groups than those with less than 14 years. This would suggest education may play some part in people gaining access to networks of people and information.

Interestingly for our hypothesis and tests of endogeneity people who are employed are more likely to participate in these social groups than those without a job. This seems to suggest that being in employment does not exclude the opportunity to participate in social activities. Indeed, this may represent comparative social isolation for those who are unemployed.

Figure 2: *Social Participation by Demographic Characteristic*



V EMPIRICAL ANALYSIS

This section presents results of empirical analysis as outlined in Section III. The section is structured as follows.

- First, we present the results of our tests the strength of our proposed instrument for weak social ties (Section III).
- We then report the results of two tests of endogeneity, an augmented regression test and the proxy Hausman test from our bi-variate probit model, with the null hypothesis being that social participation was exogenously determined.
- We go on to present the results of our full model estimation of Equation (1) followed by further models including our test for Hypotheses 3 and 4.

Table 3 presents the test of the quality of our proposed instrument for weak social ties. As outlined in Section III we perform a bivariate estimation of Equations (3) and (4) with trust in both sides and a t-test to assess if a generalised trust is not associated with employment outcomes but strongly associated with our proxy measure of weak ties.

Table 3: *Test of Instrument Quality*

Instrument	*Employment*	*Bridging Social Capital*
Trust	.124	.229 ***
	(.119)	(.069)

Note: *** indicates significance at 99 per cent ** indicates significance at 95 per cent * indicates significance at 90 per cent.

Our results show that the degree to which a person has generalised trust in others is a significant determinant of participation in social groups our proxy for weak ties, but has no significant relationship with the probability of being employed. Given the theoretical reasons for believing trust may be a valid instrument (Narayan and Pritchett, 2000) and the results of our t-test we have a strong indication that measures of generalised trust are a valid instrument for our purposes. These tests are repeated with our second measure of weak social ties and our measure of strong social ties with similar results.[2]

[2] The results for bonding social capital suggest no relationship with either employment or our measure of strong ties. These results of both tests are reported in Appendix 1.

Table 4 presents the results of our tests of endogeneity, with the null hypothesis being that social participation was exogenously determined. These tests are again performed on both measures of weak social ties.

Table 4: *Tests of Endogeneity*

Test	*Weak Ties (Binary)*	*Weak Ties (Count)*
Augmented regression	–1.69	–.46
	(15.762)	(.403)
LR test of bi-variate probit model	$Chi^2(1) = .845$	n/a
	$Prob > Chi^2 = 0.358$	n/a
Wald test of exogeniety:	n/a	$Chi^2(1) = 1.38$
	n/a	$Prob > Chi^2 = 0.239$

Note: *** indicates significance at 99 per cent ** indicates significance at 95 per cent * indicates significance at 90 per cent.

Results of our augmented regression test outlined in Section III shows no significant effect on the residual values which would suggest that endogeneity is not present in either measure of weak social ties. Allied to this our test of endogeneity (Knapp and Seaks, 1998), the likelihood ratio (LR) test of the null hypothesis, suggested that we also cannot reject the null hypothesis that our measure of weak ties is exogenous in our binary model. These results are repeated with an alternative measure of bridging social capital (number of associations) using an instrumental variables method (with the test being the Wald test of exogeniety) and again we cannot reject the null hypothesis of exogeniety. From these results we cannot reject the null hypothesis that the relationship between investment in weak social ties and employment is exogenous.

In cases where endogeneity is unclear or does not appear to be present such as this, the use of instrumental variable method is not advisable (Angrist and Pischke, 2008). As such we report the results of a number of probit regressions of Equation (1) in Table 4 which will give us a more useful approximation of the effects of our variables of interest.

- *Model 1* is a probit estimation of Equation (1) with a binary measure of weak social ties.
- *Model 2* is a probit estimation of Equation (1) with a count measure of weak social ties.

Table 5: *Probit Estimation of the Full Sample*

Variable	*Model 1*	*Model 2*
Gender: Male	.259***	.259***
	(.020)	(.020)
Age	.016 ***	.016***
	(.006)	(.006)
Age2	–.0002 ***	–.0002 ***
	(.00007)	(.00007)
Years of education	.023 ***	.022***
	(.004)	(.004)
Years of education2	–.000	–.000
	(.00002)	(.00002)
Location (1)		
Urban, a big city	–.077 **	–.079 *
	(.046)	(.046)
Town or small city	–.012	–.014
	.037)	(.037)
Country village	–.088 ***	–.092**
	(.041)	(.041)
Farm or rural property	–.064 **	–.069 **
	(.039)	(.039)
Household (2)		
More than one adult with children	–.105 ***	–.106 ***
	(.027)	(.027)
Single parent	–.205 ***	–.206 ***
	(.065)	(.066)
Network Social Capital		
Weak ties	.042 **	–
(Binary indicator)	(.02306)	
Weak ties	–	.025 ***
(Number of associations)		(.008)
Strong ties	–.029	–.031
	(.023)	(.022)
Observations	1,392	1,392
Chi^2	240.50	246.58
$Prob>Chi^2$	0.0000	0.0000
Liklihood ratio	–648.18	–645.15
Pseudo R^2	0.156	0.160

Note: *** indicates significance at 99 per cent ** indicates significance at 95 per cent * indicates significance at 90 per cent.

(1) Base location category is “suburban”.

(2) Base household is “household without children”.

Our reported coefficients from model 1 suggest that participation in social groups or outlets increases an individual's chances of being employed by 4.2 percentage points all else being equal. Additionally, results of our alternative specification model 2 suggest that the number of associations in which an individual participates has a positive effect on employment outcomes. This is interesting as it indicates that diversity of associational membership is a good thing. Our measure of strong ties on the other hand reveals no significant results, suggesting that regularity of meeting with family and friends has no impact on job prospects.

In terms of educational attainment, every year of education is associated with a 2.2 percentage point increase in the probability of being employed. As our higher order term for education also suggests that there are no diminishing returns to education our results make the case for continued education as a driver of employment prospects. Aside from our main variables our results with regard to demographics are fairly predictable.

Houses with children are less likely to be unemployed, with single parents 20.4 percentage points less likely to be employed than other groups. Age is also a significant determinant of employment status; unsurprisingly, age squared is also significant implying diminishing returns on age. In other words, there is a u-shaped relationship between age and employment – as people grow older they first are more likely to get a job but this effect diminishes with age. Living in urban areas leads to a 7.6 percentage point drop in the probability of being employed compared to our reference category people in suburban areas. This effect is also pronounced in rural areas with people in country villages suffering an 8.8 percentage point drop compared to suburbanites and people in rural properties suffering a 6.4 percentage point drop.

Finally for Model 3 we present the results of a probit estimation of our first equation with the addition of a number of interaction terms between our key independent variables and demographic characteristics. This as outlined in Section III will allow us to examine some of the variation in the quality of ties.

Interpretation of interaction terms in a linear regression model is fairly straightforward. If we were to interpret the results of the probit estimation of Model 3 (Appendix 2) in the same manner as with a linear model we would assume that our only significant interaction effects were those surrounding age and urban locational variables. However, Ai and Norton (2003), Buis (2010) and others have outlined that the interpretation of marginal effects and indicators of significance are not straight forward for interaction terms in non-linear models. Ai and Norton (2003) show that although interpreting the first derivative of the multiplicative term of two explanatory variables as an interaction effect makes sense in a linear model, in a non-linear model this

does not apply as interactions terms in non-linear models are conditional on the values of other covariates. As a result the statistical significance of interaction effects and coefficient signs may differ across observations.

In order to account for this we compute our interaction effects using Ai and Norton's (2003) Inteff programme for Stata which reports the interaction effects and z-statistic for each individual observation. For comparison we report the incorrect probit estimates of interaction terms in Model 3 in Appendix 2. Buis (2010) alternatively suggests overcoming the issue by reporting the ratio of odds ratios from a logistic regression across all possible combinations of the two interacted covariates. This has the advantage of producing one single marginal effect number for each interaction, rather than each observation, but suffers from the drawback that some find the ratio of odds ratios difficult to interpret (Ai and Norton, 2003). Although Buis (2010) has provided some clear examples of where this is not the case we continue to report our results in probability terms rather than in odds for ease of interpretation.

Table 6 contains the mean effects and z-score for our interaction effects. The mean results from Table 6 suggest that there are three significant interaction terms in the model, namely, town or small city and weak ties, age and strong ties and finally male and strong ties. These only reflect mean effects and significance levels, however. As the estimated coefficient and significance of the interaction effect vary across observations we display our results across a range of predicted values for each observation in Figures 3 onwards. This will give us a more detailed understanding of how the actual interaction effects vary within groups.

For the sake of brevity we only graph a number of interactions with effects which are statistically significant for a number of observations in this section, while the remainder are displayed in Appendix 3. The top graph of the following figures graphs the coefficient and sign of the interaction effect across the range of predicted values while the bottom graph of the figures graphs our z-statistic across predicted values. The horizontal lines in the figures containing z-statistics correspond with zero and the thresholds of statistical significance (values outside of these lines indicate statistically significant interaction effects).

Our first interaction effect on the left hand side of Figure 3 shows that the size of the coefficient on our interaction effect varies widely depending on the predicted probability of an individual being in employment. The maximum effect is .24 with minimum effects of almost 0. Our mean effects would lead us to believe that there are no significant effects but from the graph on the right hand side we can see that for a significant proportion of individuals the effect is statistically different from zero and positive with a

Table 6: *Mean Interaction Effects and Associated z-Statistics*

Variable	*Interaction Effect*	*z-Statistic*
Interaction terms		
Education*weak ties	–0.00	–0.1
	(0.002)	(0.72)
Education*strong ties	–0.01	–1.5
	(0.002)	(0.6)
City* weak ties	0.15	1.7
	(0.07)	(0.32)
City*strong ties	0.01	0.3
	(0.1)	(1.05)
Town or small city* weak ties	0.15	2.2
	(.07)	(0.35)
Town or small city* strong ties	–0.11	–1.3
	(0.07)	(0.82)
Country village* weak ties	0.08	1.1
	(0.04)	(0.13)
Country village* strong ties	–0.08	–0.8
	(0.09)	(1.04)
Farm or rural* weak ties	0.07	1.0
	(0.03)	(0.11)
Farm or rural* strong ties	–0.05	–0.5
	(0.07)	(0.84)
Age* weak ties	0.00	0.6
	(0.00)	(0.46)
Age* strong ties	–0.01	–2.1
	(0.01)	(0.6)
Male* weak ties	0.09	1.2
	(0.02)	(0.27)
Male* strong ties	–0.19	–3.1
	(0.07)	(1.44)

Note: Typically less than –1.96 or great than +1.96 for the z-statistic indicates statistically significant from zero.
Standard deviations are presented in parentheses.

maximum z-statistic of 2.24. Our results suggest that weak ties are important for people in cities with an otherwise low predicted probability of being in employment. Weak ties show no additional interaction effect in villages or rural areas (Appendix 3) but as can be seen in Figure 4 do have significant effects in towns or small cities.

Figure 3: *Interaction Effects of Living in a Big City and Weak Ties*

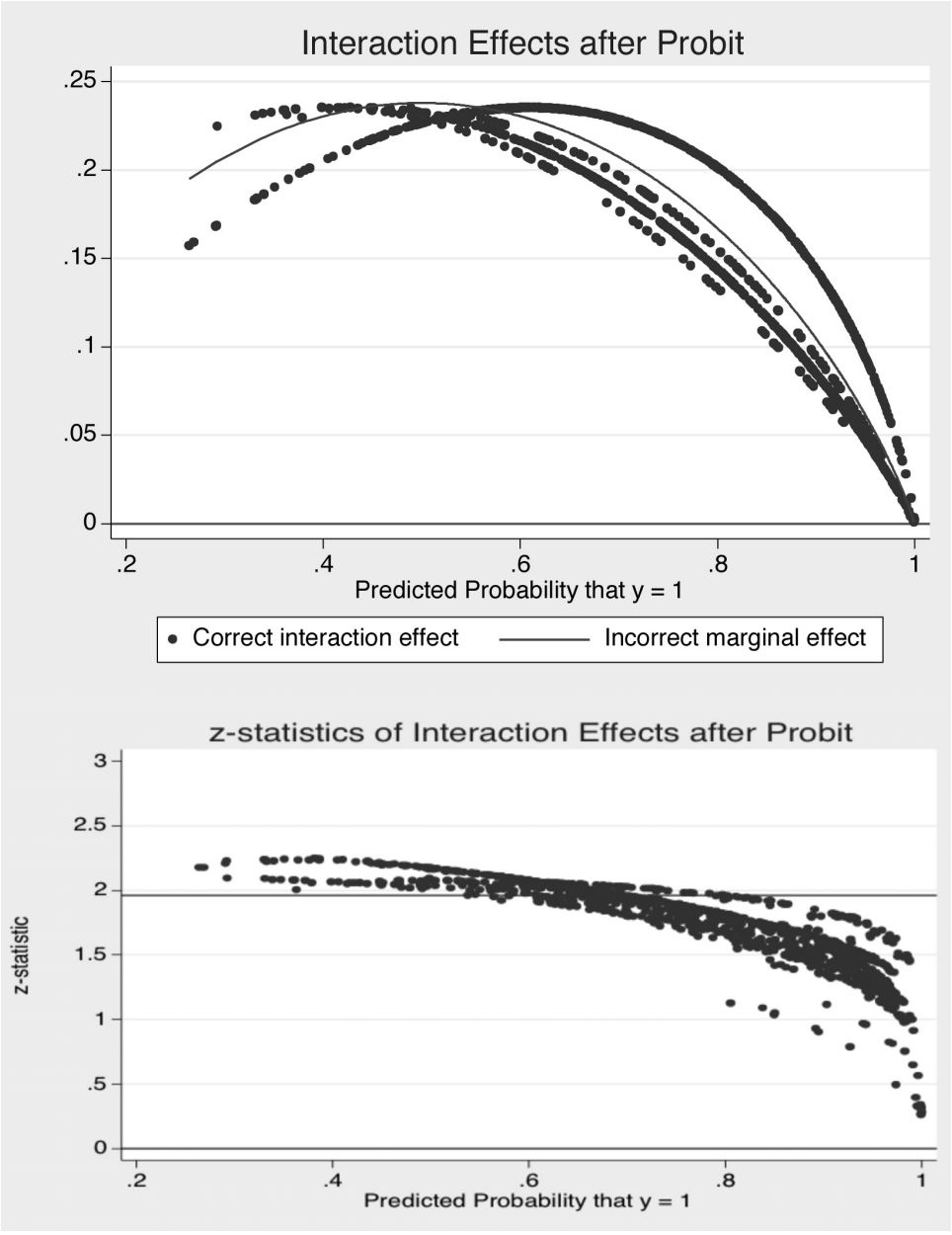
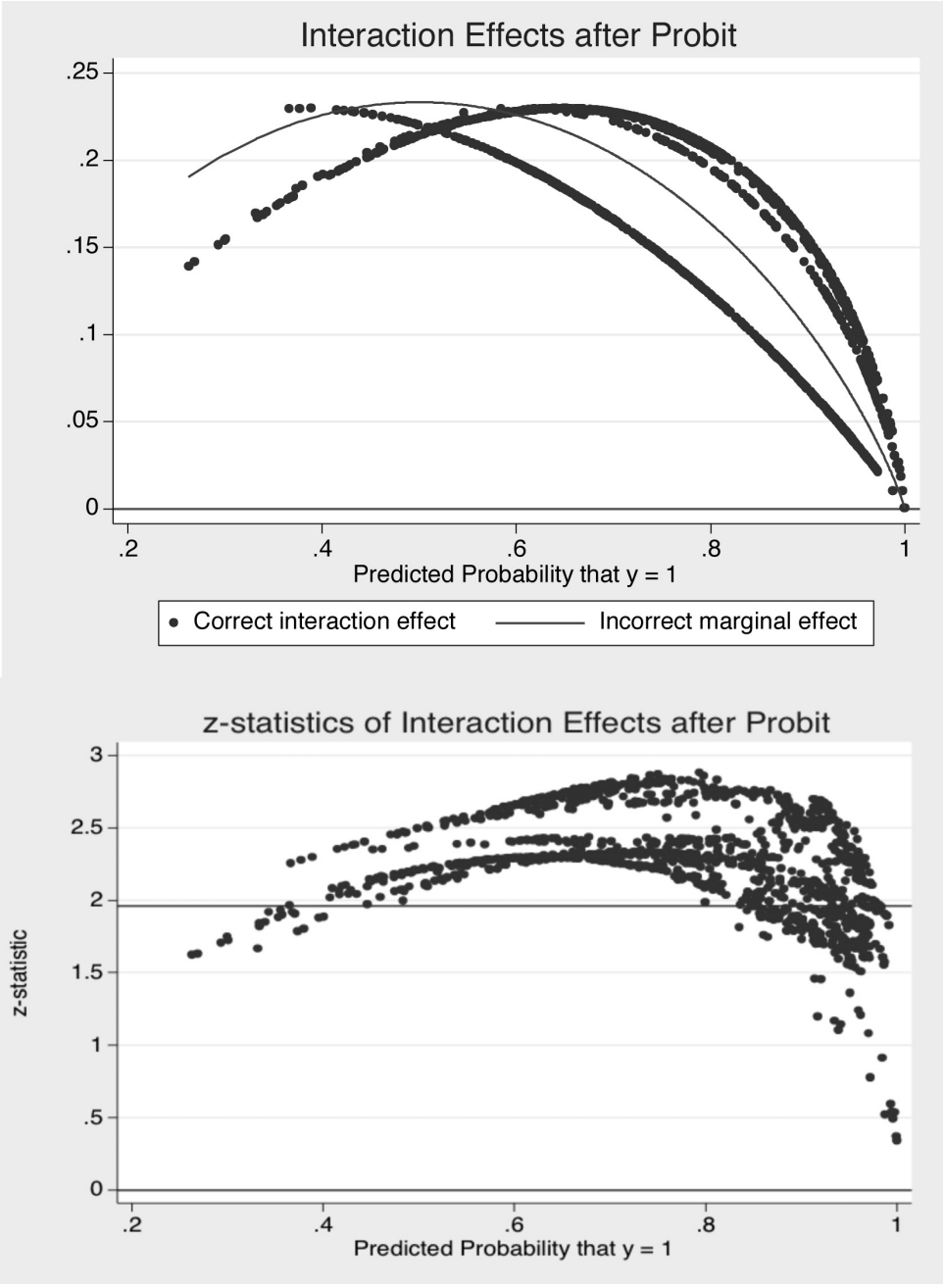


Figure 4: *Interaction Effects of Living in a Town or Small City and Weak Ties*



From Figure 4 we can see that the interaction of living in a small town and investing in weak ties has a statistically significant and large effect for the majority of individuals in the sample. The effect varies but is positive for all observations and tends to have the highest impact for individuals whose predicted probability of being in employment is around 0.6.

On the other hand there are no interaction effects between our measure of strong ties and living in a large city (Appendix 3). However, there are significant and negative effects of strong ties on individuals living outside a large city, in a small town or village or in rural areas (Figure 5 and Figs 3.3/3.4 Appendix 3).

These results suggest that weak ties are more effective in large cities, small cities and towns. This may be due to the fact that proximity to social outlets and population density may have some effect on the effectiveness of social networks in disseminating information about job prospects. It could also indicate that weak ties in urban areas are more diverse or are of better quality. Given the negative signs on binary indicators of urbanity and the positive signs on indicators of weak ties, these results suggest that social networks in some way buffer urban dwellers from negative employment outcomes. This is particularly important for individuals who have an otherwise low probability of being in employment. On the other hand strong ties have a negative effect on employment probabilities in areas outside large cities. This represents a particular issue for people with an otherwise low predicted probability of being employed.

Age, education and gender (Appendix 3) show very few significant interaction effects when interacted with our measure of weak ties suggesting that weak ties are relatively important to different age groups. This is not true, however, of strong ties. From Figure 4 we can see strong ties have a significant and negative effect on the chances of older people being in employment.

Additionally, strong ties have a negative effect on the labour market outcomes of those with higher levels of education while results are more mixed across genders (Appendix 3).

The suggestion that strong family bonds may impede labour market and other economic activity for individuals or societies is not new to the literature (Alesina and Giuliano, 2013). Family bonds can affect labour mobility, attitudes toward risk and job security and gender imbalances in employment. For example, David *et al.* (2010) show that people with strong familial or friendship ties in an area may be less willing to move to find work particularly in areas where they have little or no ties. Additionally, Algan and Cahuc (2007) and Alessina and Giuliano (2013) show that family structure explains lower female employment and also lower levels of employment among young and

Figure 5: *Interaction of Living in a Town or Small City and Strong Ties*

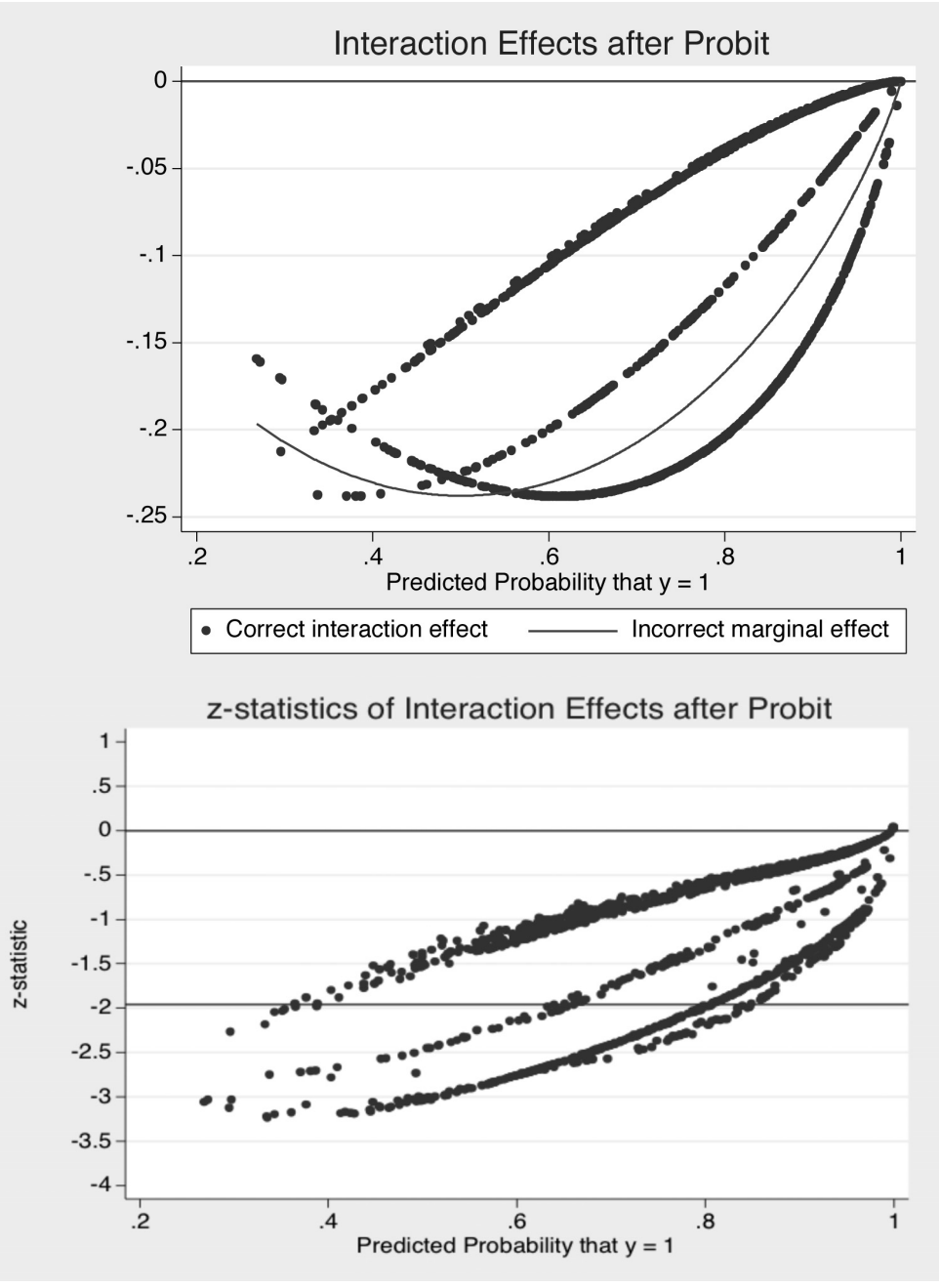
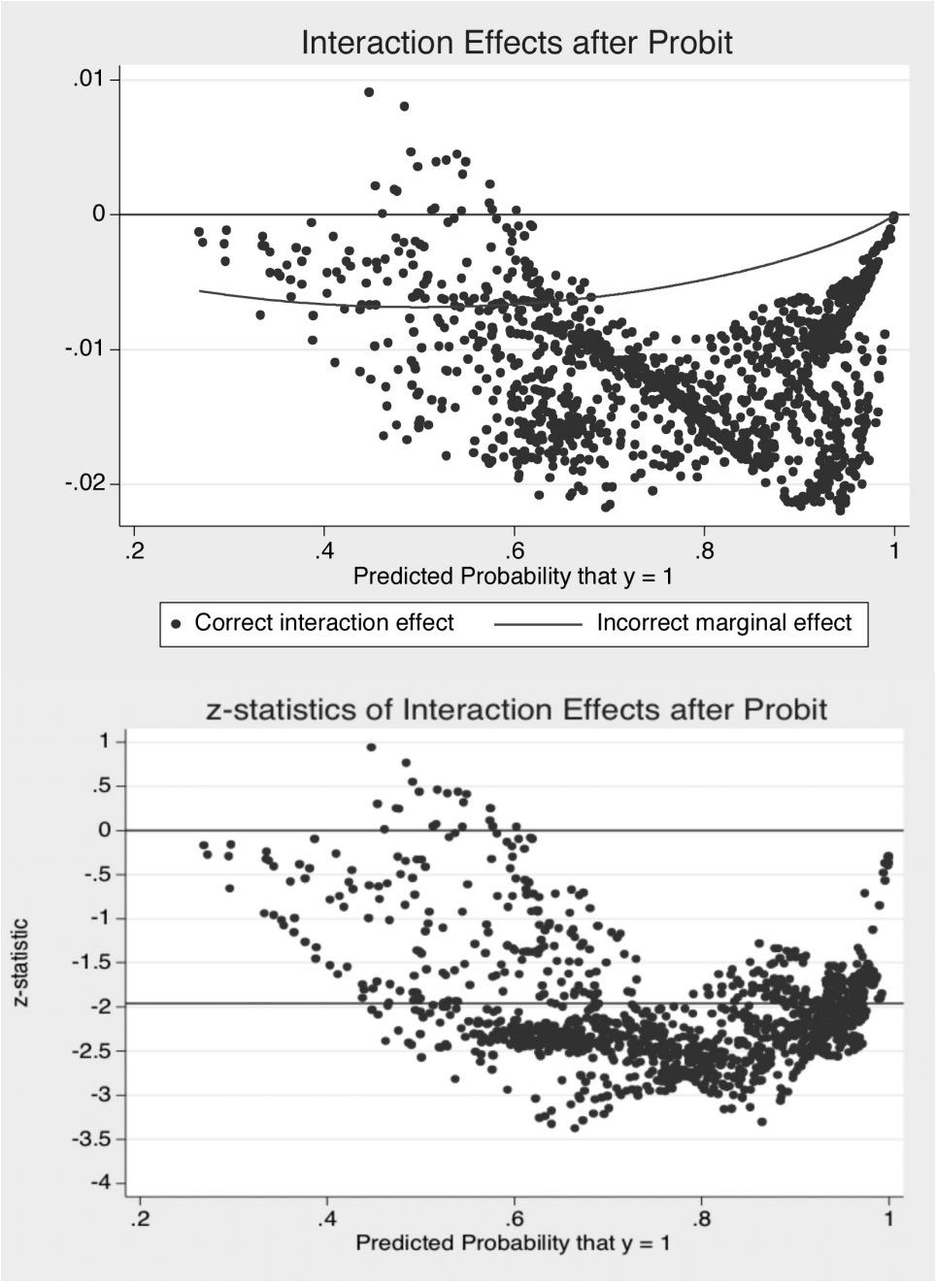


Figure 6: *Interaction of Age in Year and Strong Ties*



older people. Our results suggest support the proposition that strong ties affect the labour market prospects of older people but the results for the other two groups are much less conclusive.

VI CONCLUSION

This paper has provided a first study of the role of social networks in the Irish labour market. The results of this paper suggest a number of observations which are new to literature on the Irish labour market; chief among which is that participation in sports, social, civic, community, religious and political groups increases an individual's probability of being in employment by about 4 percentage points. This finding supports our hypothesis that weak ties will positively affect employment outcomes. On the other hand, spending time with family and friends has no direct significant effect on employment outcomes.

Our results show that there is some variation in the effects of social networks across social and geographic groups. Individual's age, education and particularly location plays a role in determining the effect of social networks on labour market outcomes.

Weak ties are also more effective in an urban context suggesting some role for ease of access to social outlets and the density and diversity of urban ties. The suggestion that social networks may be a buffer to unemployment in urban areas more so than rural ones is one that should be returned to in future study.

Our results surrounding strong ties suggest that there may be some labour market penalties to close family ties. This is particularly true for older people and people with higher levels of education. This is consistent with the emerging literature on family structures but it must be borne in mind that although there are labour market penalties to family ties these may be offset somewhat by strong family ties acting as a buffer between changes in labour market positions and changes in well-being.

The strengths of this study lie chiefly in its originality in an Irish context, the use of data which is generalisable to the overall population and a methodolgy which is as robust as possible given data restrictions and the complex social processes involved in the study.

There are also a number of limitations to our study stemming from the fact that our data was not specifically designed to measure social network or labour market outcomes. The major limitation of our study is that we do not directly measure the quality of social networks as outlined in Section III. We measure investment in social ties and the diversity of the groups but not the

"quality" of those groups in terms of social and economic position of members. We attempt to control for this by allowing our findings to vary across social and economic groups, with interesting results. Our measure of strong ties also suffers from a similar weakness in that it does not measure the extent or quality of an individual's friend's and relative's network.

Additionally, although we perform several tests which do nothing to suggest the presence of endogeniety the possibility that it is present cannot be fully discounted particularly in complex social processes such as the ones studied. Longditudal data or indeed studies specifically designed for the subject of this paper are thin on the ground and thus this is the best approximation possible at this time. The design of studies to better capture these effects in the wider labour market may be a route for future research but would likely be both costly and time consuming. As such the use of smaller studies in more controlled labour market settings, such as within organisations, may be an interesting route for further study.

There are several further questions surrounding these issues which may also be of interest for future research in an Irish context. For example empirical analysis of the trade-offs between human and social capital development given that investment of people's time is a key ingredient in the development of both social and human capital (Brüderl and Preisendörfer, 1998; Rooks *et al.*, 2009; Denny, 2003).

Woolcock and Narayan (2000) state that the challenge to policy from the "networks" perspective of social capital is to identify policies which nurture the positive aspects of strong ties while helping individuals gain access to a more diverse stock of weak ties. Our research would suggest it is access to weak ties which is more advantageous to jobseekers. Additionally it suggests weak ties may be more advantageous to certain social groups. We attribute this to a better "quality" of ties. In order to overcome this labour market disadvantage it is arguable that particular focus should be given to those groups less likely to have "quality" ties. There are some concerns in the theoretical literature, however, on whether government intervention in social networks can be effective. Jackson and Wollinsky (1996) show that in certain circumstances a government which intervenes by taxing or subsidising individuals and relationships in order to try to promote the formation of the efficient network cannot always provide the right incentives such is the complex nature of network formation. Further evaluation of the antecedents and effects of network formation in applied labour market studies may provide useful policy views on these questions in an Irish setting.

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APPENDIX I
TESTS OF INSTRUMENT QUALITY

Table A1: *T-Test of Instrument Quality*

Instrument	*Employment*	*Weak Ties (Count)*
Trust	.085	.220 ***
	(.297)	(.002)
	Employment	*Strong Ties*
Trust	.102	.012
	(.211)	(.857)

Note: *** indicates significance at 99 per cent ** indicates significance at 95 per cent * indicates significance at 90 per cent.

APPENDIX II
PROBIT ESTIMATION OF MODEL 3

Table A2: *Probit Estimation of the Full Sample*

Variable	*Model 3*
Gender: Male	.27***
	(.03)
Age	.023***
	(.006)
Age2	–.0002***
	(.0007)
Years of education	.023***
	(.006)
Years of education2	.000
	(.00002)
Location (3)	
Urban, a big city	–.181***
	(.093)
Town or small city	–.029
	(.065)
Country village	–.093
	(.071)
Farm or rural property	–.064
	(.06)
Household (4)	
More than one adult with children	–.106***
	(.02)

Table A2: *Probit Estimation of the Full Sample (Contd.)*

Variable	*Model 3*
Single parent	–.205***
	(.06)
Network Social Capital	
Weak ties	–.073
(Binary indicator)	(.05)
Weak ties	–
(Number of associations)	
Strong ties	.073
	(.05)
Interaction terms	
Education*weak ties	.006
	(.007)
Education*strong ties	–.008
	(.007)
City* weak ties	.133***
	(.04)
City*strong ties	–.028
	(.086)
Town or small city* weak ties	.131***
	(.04)
Town or small city* strong ties	–.14
	(.09)
Country village* weak ties	.09
	(.05)
Country village* strong ties	–.11
	(.08)
Farm or rural* weak ties	.078
	(.05)
Farm or rural* strong ties	–.107
	(.08)
Age* weak ties	.004***
	(.001)
Age* strong ties	–.005***
	(.001)
Male* weak ties	.035
	(.05)
Male* strong ties	–.069
	(.05)
Observations	1,392
Chi^2	266.47
$Prob>Chi^2$	0.0000
Liklihood ratio	–634.92
Pseudo R^2	0.1734

APPENDIX III
INTERACTION AFFECTS GRAPHS

Figure A3.1: *City*Strong Ties*

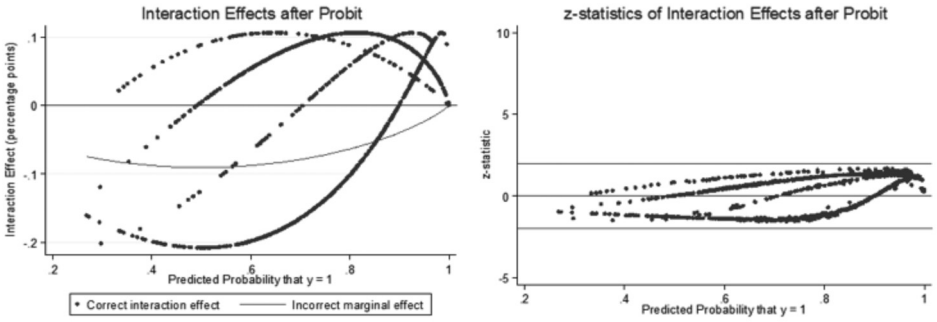

Figure A3.2: *Farm or Rural*Weak Ties*

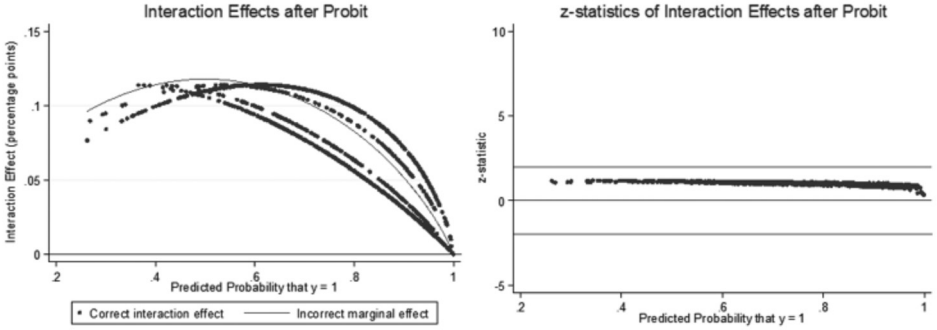

Figure A3.3: *Village or Small Town*Strong Ties*

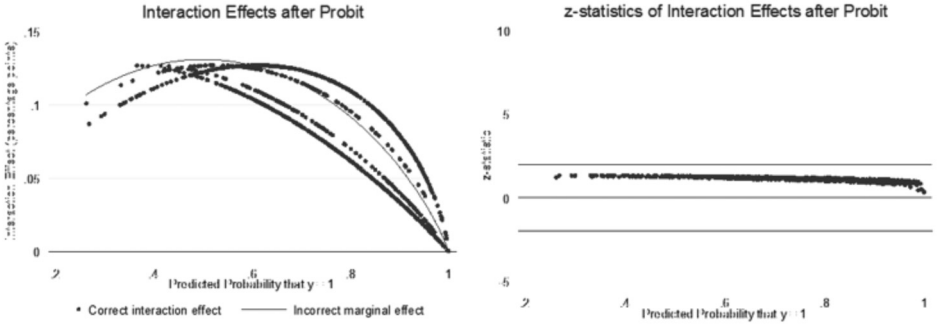

Figure A3.4: *Farm or Rural*Strong Ties*

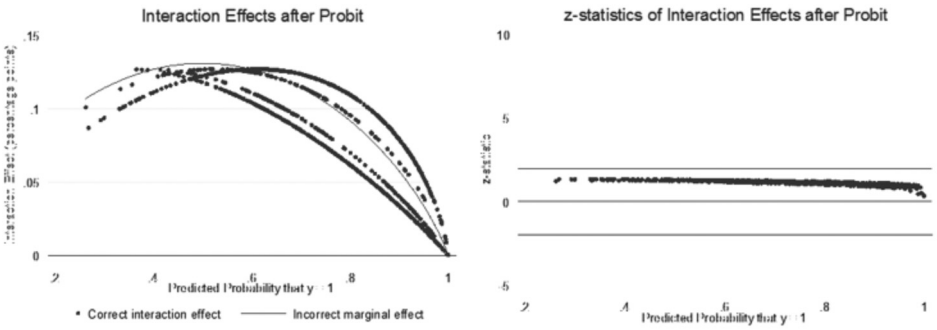

Figure A3.5: *Age*Weak Ties*

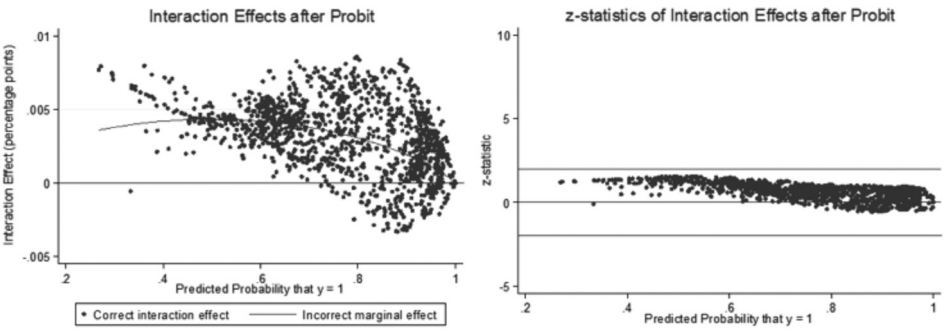

Figure A3.6: *Years of Education*Weak Ties*

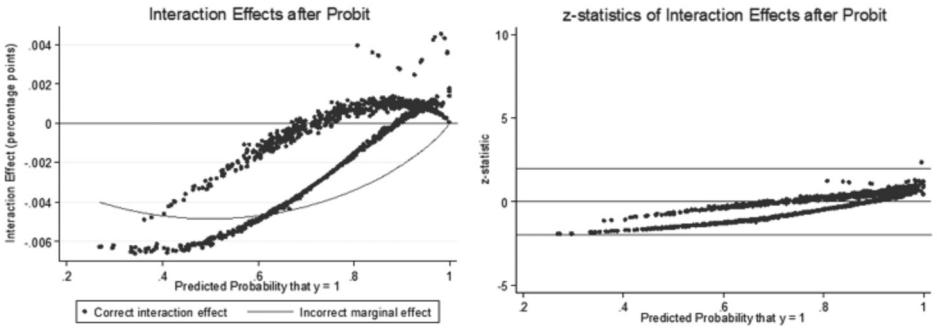

Figure A3.7: *Male*Weak Ties*

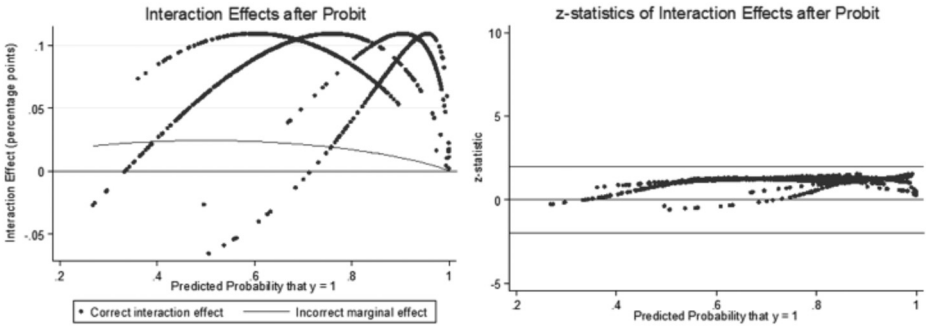

Figure A3.8: *Years of Education*Strong Ties*

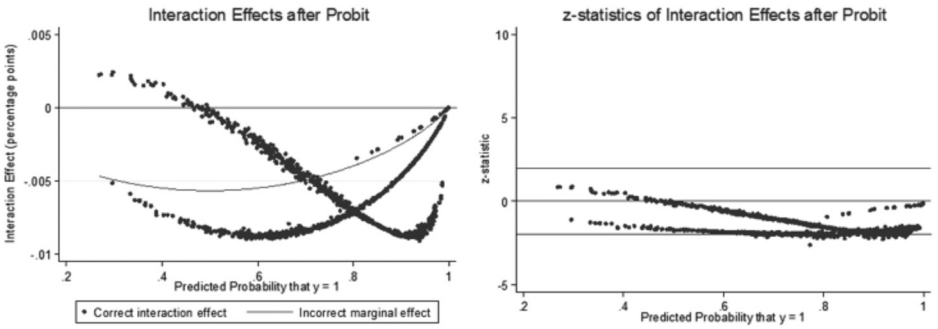

Figure A3.9: *Male*Strong Ties*