

**REGIONAL VARIATION IN OPPORTUNITY RECOGNITION:
A NETWORK-BASED APPROACH**

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ABSTRACT

This paper argues that both regional level and individual factors influence the likelihood to perceive business opportunities. Our analyses show that increasing network closure is associated with a lower likelihood to perceive opportunities. Further, whereas we find no effect for individuals' work status on opportunity recognition, we find a curvilinear effect for education, i.e., individuals with an intermediate educational level are less likely to perceive opportunities compared to those with a higher or lower educational level. We discuss our findings both from a theoretical and practical perspective.

INTRODUCTION

Shane and Venkataraman (2000) posited that a unique aspect of entrepreneurship research pertains to the question of how enterprising individuals recognize opportunities for business creation. Prior research has often focused on the role of the individual entrepreneur in the process of opportunity recognition (e.g., Shane, 2000; Cooper, 1981). In this paper we add to the research on entrepreneurial opportunity recognition by using a network perspective. We build on the literature that speaks to the importance of individuals' embeddedness in networks of relationships with others (Granovetter, 1973; 1985). Most people have many personal contacts with other people (Burt, 1986), and an individual's personal *network* consists of all of the people that the individual knows (Barnes, 1972). The entrepreneurship research has pointed to the importance of networks to entrepreneurs, and even argued that social networks may be the most significant source of knowledge for entrepreneurs (Johannisson, 1990). Further, it has been argued that social encounters between an individual and his or her network contacts may be an important source of new ideas and opportunities (Christensen & Peterson, 1990). Networks have also been linked with the number of new opportunities perceived by entrepreneurs (Singh et al., 1999). The rationale is that an individual's network can provide access to knowledge that is not currently possessed, thus leading to the potential for opportunity recognition.

Prior researchers have argued that networks differ in terms of their characteristics and that these differences may reflect the extent to which effective knowledge exchanges take place (e.g., Burt, 1992; Coleman, 1988; Davidsson & Honig, 2003). An important rationale of this paper is that different regions may differ in terms of the characteristics of their network structure, which will lead then to regional variation in the likelihood that individuals perceive opportunities. Prior studies have shown that individuals' embeddedness in social networks provide the opportunity to acquire information and ideas, which they would fail to acquire if they were outside the social network (Granovetter, 1985). That is, knowledge is not spread evenly across individuals, and access to knowledge is dependent on the extent to which one has contacts with others.

In this study, we argue that regional as well as individual level differences in terms of network-related factors affect the likelihood for opportunity recognition. In terms of the regional differences, we make a distinction between regions that are characterized by the presence of strong ties versus regions that are characterized by weak ties and structural holes. In terms of the individual level differences, we examine the extent to which individual characteristics such education and work status are related to the potential for opportunity generation through one's network.

REGIONAL EFFECTS ON OPPORTUNITY RECOGNITION

In this paper we claim that there are differences between regions in terms of the likelihood that their occupants perceive opportunities for business creation. More specifically, we make a distinction between regions in terms of their ‘network closure.’ ‘High-closure’ regions are areas characterized by strong relationships among a limited number of people (i.e., rural areas); ‘low-closure’ regions are areas with loose ties among their residents (i.e., big agglomerates or, to a lesser extent, urban areas). That is, we assume that the closure of networks is higher in rural areas compared to agglomerate areas. The rationale for the higher level of network closure in rural areas is that there are fewer potential network participants living in these areas and that it is more likely that the current residents have been living there for a significant amount of time. Similarly, agglomerate areas are characterized by a lower level of network closure since these areas are characterized by a higher number of potential contacts and by a higher likelihood that new contacts move into the area. In short, agglomerate areas will be more likely to have extensive networks of ‘loose’ contacts among their residents.

We reason then that since networks in ‘high-closure areas’ have different characteristics compared to networks in ‘low-closure’ areas, these differences will explain regional variation in the extent to which opportunities are perceived. More specifically, we draw on the literature that suggested that the closure of networks affects the flow of information among actors and the potential effectiveness of information exchange (Burt,

1992; Coleman, 1988; Gulati, 1998; Putnam, 1993). We develop two competing hypotheses in terms of the regional effects on opportunity recognition, corresponding with two different theoretical perspectives.

First, according to Coleman (1988), in regions with high closure, networks are characterized by strong ties, and everyone is well connected to others. In high-closure regions, the network arrangement is such that every node is more likely to be tied directly to every other node, compared to low-closure regions. As mentioned above, since rural areas are characterized by networks composed of smaller groups of tight-knit friends, we would expect to find a close connection of 'network nodes.' Further, because such groups of individuals are characterized by reciprocated direct links in dense subsets of relations, we would expect to find fewer structural holes in rural areas compared to urban areas (Burt, 1992). Following Coleman's arguments (1988; 1990), we would expect then that high-closure regions are more likely to give rise to opportunity recognition among their residents compared to low-closure regions. The main argument is that network closure encourages people's access to information in a timely manner and at the same time in a manner that improves the accuracy of information retrieval (Coleman, 1988). That is, network closure facilitates the enforcement of sanctions and thus makes it less likely that individuals are given access to information that is less useful or provided based on opportunistic grounds. Ultimately, since network closure creates efficiency in the knowledge exchange among the network participants based on the formation of trust and

reciprocity (Granovetter, 1985), high-closure regions are more likely to generate opportunities for new business creation.

Hypothesis 1a: High-closure regions are characterized by a higher level of opportunity recognition among their residents compared to low-closure regions.

Alternatively, whereas in Coleman's view network closure creates more intimate communication and is therefore beneficial for opportunity generation, according to Granovetter (1973) and Burt (1992), close communities may not necessarily be effective in the generation of new knowledge and ideas.

Granovetter (1973) argued that new information is more easily obtained through casual acquaintances (weak ties) than through close personal friends (strong ties). More specifically, he posited that whereas weak ties are sources for new knowledge creation, strong ties often circulate redundant information. Furthermore, given the high maintenance costs associated with close relationships, there exists a maximum in the number of 'strong ties' one can have with others. However, it is possible for individuals to have many 'weak ties' within their social network (Granovetter, 1973). Furthermore, Granovetter (1973) argued that because an individual does not interact with weak ties on a regular basis, weak ties may give better access to unique information compared to strong ties. Thus, based on the above, we would reason that it is more likely that regions

characterized by a greater number of weak ties give rise to business opportunities for their residents.

Burt (1992) extended Granovetter's argument by arguing that a network tie can provide access to new information if the tie is non-redundant, i.e., if it spans a structural hole. More specifically, Burt (1992) suggested that networks in which actors bridge structural holes between pairs of nodes generate information benefits in terms of referrals, access, and timing. In this study, we use an analogous reasoning to predict opportunity recognition at the regional level. More specifically, we hypothesize that the larger the number of structural holes in a region's network (i.e., the lower the 'network closure'), the greater the extent to which there is scope to arbitrage information flow across structural holes, and thus the higher the likelihood that the region's residents detect new opportunities.

Based on the arguments given above, we formulate a competing hypothesis in which we posit that high network closure is associated with a lower level of opportunity recognition, or put differently:

Hypothesis 1b: Low-closure regions are characterized by a higher level of opportunity recognition among their residents compared to high-closure regions.

INDIVIDUAL EFFECTS ON OPPORTUNITY RECOGNITION

In the above paragraphs we examined the effect of a regional level factor (i.e., network closure) on the likelihood that opportunities are perceived in that region. However, since individuals may have different networking opportunities based on their personal characteristics, we also examine how differences in individual-level characteristics affect opportunity recognition. Prior research has suggested that the key to understanding the opportunity recognition process lies in the examination of an individual's knowledge and skills (Shane, 2000; Shane & Venkataraman 2000). For instance, Shane's (2000) emphasized the importance of prior knowledge in the opportunity recognition process. More specifically, he showed that an individual's prior knowledge strongly contributes to one's ability to recognize opportunities. Further, Lane & Lubatkin (1998) pointed to the importance of basic skills and specific technical knowledge in the process of perceiving new ideas, and Davidsson and Honig (2003) emphasized the role of experience in the opportunity recognition process.

Entrepreneurship scholars who examined the influence of knowledge and skills in the process of entrepreneurship, have often labeled these factors as 'human capital' (e.g., Cooper et al., 1994; Gatewood et al., 1995). An important contribution to the research on the role of human capital dates back to Becker's (1964) work in which the idea was advanced that education and training are important aspects in economic analysis, just like equipment or other material assets. Becker (1964) argued that human capital is comprised

of attributes which can be associated with individuals' behavior and success. Furthermore, prior research has suggested that someone's human capital is associated with his or her participation in networks (Coleman, 1988). Therefore, building human capital conducive to entrepreneurship, e.g., developing skills to perceive opportunities, is also a social process (Nance, 1999).

In this paper, we examine two dimensions of individuals' human capital that may influence the access to network resources, and thus increase opportunity recognition, i.e., education and work status. Education and workplace experience are indeed indicators of human capital that have often been used in labor force participation analyses, and these dimensions have been associated with the behavior and success of (potential) entrepreneurs (Bates, 1997; Evans & Leighton, 1989; Greene, 2000).

Education may help people develop skills and knowledge that are advantageous for recognizing opportunities to create a new venture. The empirical findings for the relationship between someone's educational level and the likelihood to perceive opportunities for start-ups have been inconclusive, however (Greene, 2000). Some researchers have argued that higher educated people are more likely to see opportunities for entrepreneurship, whereas others argued that educational credentials may make it easier to find employment working for others, thereby reducing the motivations to look for start-up opportunities (Bates, 1995; Bates & Servon, 2000; Fairlie & Meyer, 1996).

However, the focus of our study is on factors that affect the likelihood to recognize opportunities, irrespective of the fact whether one acts upon these opportunities through

start-up activities. We argue that individuals' educational level will positively affect the likelihood to perceive opportunities because highly-educated individuals have a broader knowledge base to draw from (Cohen & Levinthal, 1990). This expanded knowledge may not only result from the skills acquired through education and training, but also from the connections that have been developed with other 'knowledgeable' others, e.g., alumni from someone's educational institution (Burt, 1992; Cohen & Levinthal, 1990). Furthermore, one could also argue that someone's educational credentials may increase the search for opportunities because one will have more self-confidence that one has the capabilities to come up with good ideas for new venture creation (Bandura, 1978). Based on the above, we contend that there is a positive relationship between education and opportunity recognition.

Hypothesis 2: Individuals with a higher educational level are more likely to recognize opportunities compared to those with a lower educational level.

Further, we hypothesize that someone's work status will affect the likelihood to be exposed to a wider set of knowledge, and thus, to perceive opportunities for business creation. We define work status in terms of whether the individual plays an active role in the labor market (i.e., is currently employed) versus has a passive status (i.e., is unemployed, student, retired or disabled). We argue that people with an active work status will have more opportunities to develop valuable contacts, compared to people who are 'outside' the working system (Burt, 1992). First, we reason that the work place forms a natural environment for opportunity recognition, since this environment allows

people to spot new opportunities in their own or contiguous industries. Furthermore, the work place constitutes a setting conducive to building a network based on professionally oriented contacts. Individuals who are not part of the active economic system will be less likely to build such network contacts. Therefore, we hypothesize that individuals who have an active work status will be more likely to perceive opportunities compared to others who are not part of the working system.

Hypothesis 3: Individuals with an active work status are more likely to recognize opportunities compared to those with a passive work status.

METHODOLOGY

Sample

Our analyses are undertaken on a representative sample of the adult population in two countries, Belgium and Finland. Although the focus of this study is not on making cross-country comparisons in terms of the determinants of opportunity recognition, we pooled the data from two small countries within Europe. More specifically, we collected data from a representative sample of the population of Belgium (N = 4057) and Finland (N = 2005) through the 2002 Global Entrepreneurship Monitor project. Telephone interviews were conducted during the Summer of 2002 using a standardized questionnaire translated from English into the native language(s) of each country (i.e., Dutch and French for Belgium; Finnish for Finland). In this paper we used a selected group of variables collected through these phone surveys with all respondents that were between 18 to 64 years old at the time of the interview. This led to a total number of 3102 eligible responses in Belgium and 1434 in Finland. As a result, our analyses are based on a total sample of 4536 adults. In order to assure that the respondents correctly reflected the population from which they were drawn, each respondent was assigned a weighting factor that took into account their gender and age. Further, the weights were also adjusted according to the country to which the respondent belonged, i.e., the weights were normalized among the Belgian and Finnish respondents respectively.

Measures

In the following paragraphs, we explain how we operationalized the different variables. A short description of the variables and their measurement is given in the Appendix.

Dependent variable

Opportunity recognition: We asked the respondents whether ‘in the next six months there would be good opportunities for starting a business in the area where they lived.’ This measure is a binary variable (1 = Yes, 0 = No). In order to calculate the overall level of opportunity recognition in a particular type of region (i.e., big agglomeration, urban location, or rural location: see below), we divided the number of ‘yes’ responses by the number of respondents in that region.

Predictor variables

Network closure: In order to assess the level of ‘network closure’ of the region to which a respondent belonged, we made a distinction between three types of residential areas: (1) ‘rural location,’ (2) ‘urban location,’ and (3) ‘big agglomerate.’ ‘Big agglomerates’ represent areas where there is a multitude of weak ties and loose contacts between the residents, whereas ‘rural locations’ refer to areas that are characterized by the presence of strong, close ties. We assigned a value ranging from ‘1’ to ‘3’ to these three categories

respectively. However, for the regression analysis (see later), we constructed three binary variables, and we used ‘big agglomerate’ as the base case.

Education: The respondents were assigned to three categories in terms of their educational level: (1) some secondary education, (2) secondary degree, and (3) post-secondary degree. These categories were given a value ranging from ‘1’ to ‘3’ respectively. Again, we constructed three binary variables for the regression analyses; the middle category (‘secondary degree’) was used as the base case.

Work status: Work status was coded as a binary variable. A value of ‘1’ was assigned to respondents with an ‘active’ work status (i.e., employed on a full-time or part-time basis), and a value of ‘0’ to respondents with a ‘passive working status (i.e., unemployed, student, retired, or disabled).

Control variables

We also included three control variables in order to check whether our hypothesized predictor variables affect the level of opportunity recognition beyond the impact of these controls. *Age* was measured as a continuous variable (ranging between 18 and 64). *Gender* is a binary variable: male respondents were assigned a value of ‘0,’ and female respondents a value of ‘1.’ Finally, we included a binary variable to control for the *country* in which the respondent resided (‘0’ for Belgium and ‘1’ for Finland).

Data analysis

We used two techniques to test our hypotheses. First, we tested whether there are differences in the terms of the level of opportunity recognition among the three types of regions, i.e., big agglomerates, urban locations, and rural locations. We used a Chi-square test to assess the presence of differences in opportunity recognition across these area types. Second, we formally tested our hypotheses by using multivariate analyses. Since our dependent variable is discrete, we could have used an ordinary least squares regression to fit a linear probability model. However, because a linear probability model is heteroskedastic and may predict probability values beyond the (0,1) range, we decided to use a logistic regression model to assess the effect of our predictor (and control) variables on the level of opportunity recognition (Greene, 1997; Stynes & Peterson, 1984). The predictor variables were entered using the 'backward stepwise' method. That is, all variables together were first entered into the model, and then it was tested whether some variables should be removed from the model. The potential removal of a variable was based on the significance of the change in the 'log-likelihood' value (Greene, 1997; Stynes & Peterson, 1984).

RESULTS

First, we analyzed the variation in the level of opportunity recognition with respect to the residential area to which the respondents belonged (Table 1). The results across the two countries (i.e., ‘whole sample’) indicate that the level of opportunity recognition is generally higher in big agglomerates (38.9%), compared to urban locations (24.8%) and rural locations (20.4%) ($\chi^2=95.61$, $df=2$, $p<.001$). We also made some further analysis to check whether these inter-regional differences are consistent in the two countries included in this study. Whereas we found significant variation across the three residential areas in Finland ($\chi^2=34.30$, $df=2$, $p<.001$), in Belgium, this variation is not significant ($\chi^2=4.52$, $df=2$, $p=.11$). We will further address this issue in the discussion section of the paper. In general, the above analysis shows that the level of opportunity recognition varies across different residential areas. It is also interesting to note that the overall level of opportunity recognition is higher in Finland than in Belgium. In Finland, 51.2% of all respondents perceived good opportunities to start a business, compared to only 16.7% in Belgium ($F=914.52$, $df=3584$, $p<.001$).

(insert Table 1 about here)

Second, we developed several regression models for the pooled data (i.e., Belgian and Finnish respondents) and we used logistic regression analysis because our dependent variable is dichotomous. The descriptive statistics of the variables are provided in Table

2, the correlation table is given in Table 3. It can be seen that our average respondent is 41 years and has secondary or above secondary level education. Further, women and men are equally represented in our sample.

(insert Table 2 about here)

(insert Table 3 about here)

The results of the logistic regression are presented in Table 4. We include four models: each model includes different blocks of independent variables. The order in which the variables were entered pertains to the level of analysis, i.e., individual-level control variables (Model 1), individual-level predictor variables (Model 2), regional-level variable (Model 3), and country-level variable (Model 4).

(insert Table 4 about here)

In the first step, we entered two control variables, measuring the demographic characteristics of the respondents, i.e., age and gender (Model 1). The overall model is significant at the $p < .005$ level according to the model chi-square statistics. The model predicts 71.6% of the responses correctly. The results indicate that someone's age has no significant effect on the likelihood to perceive opportunities. However, we do find gender effects: the coefficient of the 'gender' variable is negative and significant ($p < .001$), i.e., males are more likely to perceive opportunities compared to females.

In the second step, we entered the two variables measuring individual-level factors related to networking, i.e., education and work status (Model 2). According to the block chi-square statistics, Model 2 is superior to Model 1 in terms of the overall fit. The block chi-square statistic is significant at the $p < .001$ level. The model predicts 71.6% of the responses correctly. In the backward regression, 'work status' was removed from the final model. In other words, someone's work status has no effect on the level of opportunity recognition. This is contradictory to Hypothesis 3. The results for 'education' are more complex. Model 2 shows that individuals' level of education is related to the level of opportunity recognition. However, the relationship is not positive as predicted by Hypothesis 2, but curvilinear. Low and high levels of educational are related to significant more opportunity recognition compared to a medium level of education (the medium category 'secondary degree' was used as the base case in the regression). Further analysis showed that those holding 'less than a secondary degree' are twice as likely to perceive opportunities compared to those holding a secondary degree. Similarly, those holding a post-secondary degree are twice as likely to perceive opportunities compared to those with a secondary degree.

The third model contains one additional variable, i.e., network closure (Model 3). According to the block chi-square statistics, Model 3 is superior to Model 2 in terms of the overall fit. The block chi-square statistic is significant at the $p < .001$ level. The model predicts 71.6% of the responses correctly. The results of Model 3 indicate that the level of network closure (cf., the nature of the residential area) is significantly related to likelihood to perceive opportunities. In the regression analysis, the category 'big

agglomerate' was used as the base category against which the two other categories were compared. The coefficient of the 'urban location' variable is negative and significant at the $p < .001$ level. Further analysis showed that individuals living in an urban area are about 0.6 times less likely to perceive opportunities compared to those living in a big agglomerate. The coefficient of the 'rural location' variable is even more negative and also significant at the $p < .001$ level. Those living in a 'rural location' are less than 0.5 times as likely to perceive opportunities compared to those living in a 'big agglomerate.' Our results thus support Hypothesis 1b, and not the competing Hypothesis 1a.

In the fourth model we added the country (control) variable to the regression equation. It can be seen that Model 4 is better than Model 3 in terms of the overall fit. The block chi-square is significant at the $p < .001$ level. The model predicts 73.3% of the responses correctly. The results of Model 4 indicate that, all else being equal, someone's country of residence is related to the likelihood to perceive opportunities. The coefficient of the 'country' variable is significant at the $p < .001$ level. Further analyses showed that, all else being equal, individuals living in Finland are more than three times as likely to perceive opportunities compared to those living in Belgium.

DISCUSSION

Regional factors

We adopted a network-based approach in proposing that regional as well as individual level aspects affect the perception of opportunities. To address this issue, we turned our attention to the literature on social networks. Our findings seem to support Granovetter's (1973) reasoning that weak ties can function as 'bridges' to knowledge that are not included in someone's personal network of direct contacts. More specifically, in regional settings where it is more likely that new information will be provided through one's network (e.g., because of the higher number of possible contacts or the higher 'in-stream' of new contacts), there will be more potential to perceive business opportunities. Furthermore, our findings support Burt's (1992) research on 'structural holes.' That is, it is not as such the strength of the relationship between network ties that affect the potential for knowledge generation, but rather the 'gaps' that exist between network relationships. While a close network of tight-knit ties may facilitate the process of knowledge exchange between individuals (Coleman, 1988), an individual who is embedded in such a close network may be exposed to redundant information, and therefore be less likely to detect new opportunities. Individuals who live in 'big city areas' – characterized by the presence of many structural holes and a variety of potential network contacts – will have access to a more expansive and diverse level of knowledge. This can give them an advantage in terms of perceiving opportunities compared to individuals living in 'more stagnant' rural areas. In short, we found that, at the regional

level, the likelihood of opportunity recognition increases with decreasing network closure.

Individual factors

Surprisingly, we found no support for our hypotheses pertaining to the role of the two individual-level factors pertaining to individuals' access to networks, i.e., education and work status. First, we found a U-shaped relationship, rather than a positive relationship, between someone's educational level and the likelihood to recognize opportunities. In other words, our results suggest that individuals with high or low educational credentials will perceive more opportunities compared to those with an intermediate educational level. This is somewhat surprising since a higher educational record should provide someone with an improved ability to find new ways to utilize existing resources or should provide better access to the potential information held by 'knowledgeable' others (Davidsson & Honig, 2003). One explanation for the high opportunity recognition among individuals with low levels of education may be that this group is 'forced' to look for start-up opportunities because they cannot find regular employment in existing organizations. This reasoning is highly speculative, however, and more refined research is needed in this area. In this regard, it is important to recognize that we predicted the likelihood to perceive opportunities irrespective of the nature of these opportunities. Future research should investigate in more detail the relationship between someone's educational level and the high-potential character of opportunities. One could argue, for instance, that while low education may encourage people to look for start-up

opportunities, the lack of adequate skills may limit the possibility that a business with high growth potential is set up.

Further, we found that someone's work status is not related to the likelihood to perceive opportunities. We argued that individuals' active participation in the economic system (i.e., by being employed rather than being without occupation) offers the potential to recognize opportunities that are related to the current business activities. Also, we reasoned that the work place may function as an environment conducive to the development of network contacts with others. One explanation for the lack of an effect of our 'work status' variable on opportunity recognition is that the work environment may be only one of the potential sources of information relevant for start-up activities. That is, most people have many personal contacts with other people through a combination of professional as well as more informal (friends- or family-related) relationships (Burt, 1992; Davidsson & Honig, 2003). Furthermore, we used a crude proxy for determining the working experience of our respondents, i.e., being employed (full-time or part-time) versus being unemployed, student, retired or disabled at a given point in time. Future research should include a wider range of possible network types to which individuals belong and assess the extent to which working experience has been accumulated over time.

Finally, it is also interesting to look at the results for our control variables. Interestingly, we found no age effects; the regression analysis showed no significant difference between younger and older respondents in terms of the likelihood to recognize

opportunities. However, we did find that, all else being equal, males are more likely than females to be opportunity-minded. This finding is consistent with Crosa et al.'s (2002) finding that gender affects the likelihood of business formation. Our results confirm that there is a huge untapped potential among women in terms of opportunity recognition for start-ups. There are no objective reasons as to why women would be less able than men to recognize business opportunities. Future research should examine to what extent cultural factors may explain why women are less 'opportunity-minded' than men.

Additional analyses

Although the focus of our study was not on making comparative analyses across different countries, an interesting result was that the Finnish respondents were more likely to perceive opportunities compared to their Belgian counterparts. This is somewhat surprising given the similarity between the Finnish and Belgian context. Since we did not anticipate to find such a strong country effect, we decided to explore further the differences between Finland and Belgium. In order to do so, we constructed an additional regression model in which we added the interaction terms between the country dummy and the predictor and control variables (detailed results not reported in the paper). We found that, compared to the Belgian situation, opportunity recognition in Finland is relatively more likely to occur among the younger and female population. Further, consistent with the results from Table 1, we found that the difference in terms of opportunity recognition between different types of residential areas is much more pertinent in Finland than in Belgium. A possible explanation of this last phenomenon is

that the negative association between closely-held networks and the level of opportunity recognition (Burt, 1992; Granovetter, 1973) may be particularly strong in the remote areas in Finland. Belgium, on the contrary, is more homogeneous in terms of the structure of its city, urban and rural areas. Future researchers should compare the drivers for opportunity recognition across a wider variety of countries and cultures than the ones included in this study. This could allow to examine whether cultural factors (e.g., acceptance of uncertainty, social norms) or other factors (e.g., distribution of population density, immigration patterns) affect the extent to which a country's citizens recognize opportunities to start a new business.

Since a weakness of this study may be our relatively crude proxy used to assess different types of regions (i.e., in terms of being 'agglomerate,' 'urban,' or 'rural' area), we had a closer look at the nature of the regions under study. In the paper, we associated 'high-closure' regions with rural areas, and 'low-closure' regions with big agglomerates and, to a lesser extent, urban areas. The reasoning was that rural areas are more likely be characterized by the presence of tight-knit networks given the more limited number of potential network participants and the lower level of 'in-stream' of new contacts in the region. On the other hand, big agglomerate areas, we argued, are more likely to have a 'more loose' network structure and to be characterized by the presence of weak ties and structural holes. Although our reasoning may hold to a great extent, it would have been better to include additional dimensions to capture 'network closure,' such as population size, population density, and migration rate. In order to get a more detailed picture of the relationship between the level opportunity recognition on the hand and regional

characteristics on the other, we carried out some additional analyses to assess differences in opportunity recognition across different types of regions.

First, for Belgium, we checked whether there are differences in terms of the level of opportunity recognition across the ten NUTS II regions. For the capital region of Brussels, we made a separate category. We thus made comparisons across 11 regions in terms of 'whether one perceives good opportunities for starting a business in the area where one lives.' The highest percentages were found for 'Brabant Wallon' (29%), 'Liège' (23%) and Brussels (22%). The first two regions belong to the French speaking part of Belgium, the third region is the bilingual capital region. The differences across the eleven regions were significant ($\chi^2=46.05$, $df=10$, $p<.001$). We also made a comparison across the three institutional regions of Belgium: Flanders (Dutch language), Wallonia (French language) and Brussels (bilingual Dutch-French). Surprisingly, we found that Wallonia (20%) scores only slightly lower than the capital region of Brussels (22%); Flanders comes in third position (12.8%). The reason for the relatively high score for Wallonia may partly be the result of the campaign '4x4 Entreprendre' launched by the Walloon government, an initiative aimed at stimulating entrepreneurship.

Second, for Finland, we made comparisons across four geographic regions (South, East, West, North), also following the NUTS regional classification system. Similar with the Belgian case, we then separated the capital region of Helsinki from the rest of South Finland. We found that the overall level of opportunity recognition varies across the geographic regions. It is highest in the capital region of Finland (64%) and lowest in East

Finland (43%) and West Finland (43%). North Finland (51%) and South Finland (49%) fall in the middle group. The differences between the regions are statistically significant ($\chi^2=25.65$, $df=5$, $p<.000$).

Since our analyses had shown that there are differences in terms of the level of opportunity recognition across the different types of residential areas in Finland (Table 1), we also undertook further detailed analyses for this country. For instance, we found that there is variation in terms of opportunity recognition across the different urbanized regions in Finland: the three big cities (Capital region of Helsinki, Turku and Tampere) have a higher overall level of opportunity recognition compared to other towns, rural population centers and countryside ($F=43.90$, $df=1048$, $p<.001$). Further, we also found differences across the big three cities: surprisingly, the highest opportunity recognition level was found in Turku (83%), followed by the capital region Helsinki (70%) and Tampere (68%). We would have assumed that the capital region would report the highest level, since it can be considered as the economic center of Finland.

We also examined whether someone's likelihood to recognize opportunities was dependent on *different* categories of individual level factors according to the region the individual belongs to (this analysis was only done for Finland). We used stepwise logit regression analysis; that is, we first entered our control variables (age, gender), and then in the next step we entered the individual-level proxies for someone's embeddedness in networks (education, work status). The results are shown in Table 5. It can be seen that there are geographic differences in terms of which individual factors are associated with

the likelihood to perceive opportunities. For instance, the 'education' variable is significant in South Finland and Middle Finland ($p < .05$). In both of these regions, respondents with graduate degrees are more likely to perceive opportunities compared to respondents with a lower level of education. Also, work status is – surprisingly – negatively related to opportunity recognition in Middle Finland ($p < .01$). In that region, working respondents are only one third as likely to report perceiving opportunities than those who are 'not working'. Finally, it can be seen that 'gender' is significant in East Finland ($p < .05$) and 'age' in North Finland ($p < .10$). More research is needed to examine the interaction effects between regional and individual-level factors on the likelihood to perceive opportunities.

(Insert Table 5 about here)

Practical implications

From a practical point of view, our findings suggest that personal networks can play a crucial role in accessing and synthesizing information relevant to opportunity recognition. Most decisions to start a new venture are quite complex and ask for the access to information from more than a single source. Consequently, individuals that plan to engage in start-up activity need to pool information from a variety of sources. While few persons may be able to search for this information on their own, it is often more expedient to get the information from knowledgeable others (Davidsson & Honig, 2003). Our results showed that information useful for opportunity recognition may be most effectively provided in networks characterized by a multitude of weak ties and/or

structural holes. Therefore, individuals should be aware of potential sources for 'brokerage' of information that leads to business creation. Put differently, individuals should not only rely on their current network of contacts but extend their network by bridging structural holes through brokerage mechanisms. It should be noted, however, that effective networking consumes a considerable amount of time and energy, especially for individuals who are currently involved in a full-time occupation. If networking fails to provide a feeling about future business opportunities, such activities could be quite frustrating to the potential entrepreneur. The results of this study should therefore encourage regional authorities to invest resources in building and maintaining effective network relationships among their residents. This may be especially true when the region has no strong tradition in terms of new business creation.

REFERENCES

- Anheier, H., J. Gerhards, & F. Romo 1995, 'Forms of capital and social structure in cultural fields: Examining Bourdieu's social topography,' *American Journal of Sociology*, **100**, 859–903.
- Baker, W. 1984, 'The social structure of a national securities market,' *American Journal of Sociology*, **89**, 775–811.
- Bandura, A. 1978, 'Reflections on self-efficacy,' *Advances in Behavioral Research and Therapy*, **1**, 237-269.
- Barnes, J. 1972, *Social Networks*. Philippines: Addison-Wesley.
- Bates, T. 1995, 'Self-Employment Entry Across Industry Groups,' *Journal of Business Venturing*, **10**, 143–156.
- Bates, T. 1997, 'Financing Small Business Creation: The Case of Chinese and Korean Immigrant Entrepreneurs,' *Journal of Business Venturing*, **12**, 109–124.
- Bates, T., & L. Servon 2000, 'Viewing Self-Employment As a Response to Lack of Suitable Opportunities for Wage Work,' *National Journal of Sociology* **12**, 23–55.
- Becker, G.S. 1964, *Human Capital*, Chicago: U of Chicago Press.
- Burt, R. 1983, *Applied network analysis: A methodological introduction*, ed. R. Burt and M. Minor, 176–194. London: Sage.
- Burt, R. 1986, 'A Cautionary Note.' *Social Networks*, **8**, 205–211.
- Burt, R. 1992, '*Structural holes: The social structure of competition.*' Harvard University Press: Cambridge.
- Christensen, P.S., & R. Peterson 1990, 'Opportunity identification: Mapping the sources of new venture ideas.' *Frontiers of Entrepreneurship Research*, Wellesley, MA: Babson College, 567–581.
- Cohen, W. M., & D. A. Levinthal 1990, 'Absorptive Capacity: A New Perspective on Learning and Innovation,' *Administrative Science Quarterly* **35**, 128–152.
- Coleman, J.S. 1988, 'Social capital in the creation of human capital,' *American Journal of Sociology*, **94** (Special Supplement), 95-120.

- Coleman, J.S. 1990, *Foundations of Social Theory*. The Belknap Press of Harvard University Press: Cambridge, MA.
- Cooper, A. C. 1981. 'Strategic Management: New Ventures and Small Business.' *Long Range Planning*, 14(5): 39–45.
- Crosa, B., H. E. Aldrich, & L. Keister 2002, 'Is There a Wealth Affect? Financial and Human Capital as Determinants of Business Startups,' *Frontiers of Entrepreneurship Research*, Wellesley, MA: Babson College.
- Cooper A.C., F.J. Gimeno-Gascon, & C.Y. Woo 1994, 'Initial Human Capital as Predictor of New Venture Performance,' *Journal of Business Venturing*, **9**, 371-395.
- Davidsson P, & B. Honig 2003, 'The role of social and human capital among nascent entrepreneurs.' *Journal of Business Venturing*, **18**, 301-331
- Evans, D. S., & L. Leighton. 1989, 'Some Empirical Aspects of Entrepreneurship,' *American Economic Review*, **9**, 519–535.
- Fairlie, R., & B. Meyer 1996, 'Ethnic and Racial Self-Employment Differences and Possible Explanations.' *Journal of Human Resources* 31 (4):757–93.
- Gatewood E.J., K.G. Shaver KG, & W.B. Gartner 1995, 'A Longitudinal-study of cognitive-factors influencing start-up behaviors and success at venture creation,' *Journal of Business Venturing*, **10**, 371-391.
- Granovetter M. 1973, 'The strength of weak ties,' *American Journal of Sociology*, **78**, 1360-1380.
- Granovetter M. 1985, 'Economic actions and social structure: The problem of embeddedness,' *American Journal of Sociology*, **91**, 481-510.
- Greene, W.H. 1997, *Econometric Analysis*, 3rd ed. Prentice Hall.
- Greene, P.G. 2000, 'Self-employment as an economic behavior: An analysis of self-employed women's human and social capital,' *National Journal of Sociology*, **12**, 1–55.
- Gulati, R. 1998, 'Alliances and networks,' *Strategic Management Journal*, **19**, 293-317.
- Johannisson, B. 1990, 'Economics of Overview—Guiding the External Growth of Small Firms,' *International Small Business Journal*, **9**, 32–44.

- Kirzner, I.M. 1973, *Competition and Entrepreneurship*. Chicago: University of Chicago Press.
- Kirzner, I.M. 1979, *Perception, Opportunity and Profit*. Chicago: University of Chicago Press.
- Lane, P.J., M. Lubaktin 1998, 'Relative absorptive capacity and interorganizational learning,' *Strategic Management Journal*, **19**, 461-477.
- Neance, M. B. 1999, 'Entrepreneurs in emerging economies: Creating trust, social capital, and civil society,' *Annals of the American Academy of Political & Social Science*, **565**, 148–152.
- Podolny, J., & J. Baron 1997, 'Resources and relationships: Social networks and mobility in the work place,' *American Sociological Review*, **62**, 673–693.
- Putnam, R. 1993, *Making Democracy Work*. Princeton: Princeton University Press.
- Shane S. 2000, 'Prior knowledge and the discovery of entrepreneurial opportunities,' *Organization Science*, **11**, 448-469
- Shane, S., & S. Venkataraman. 2000, 'The promise of entrepreneurship as a field of research,' *Academy of Management Review*, **25**, 217-226.
- Singh, R., G.E. Hills, R.C. Hybels, & G.T. Lumpkin 1999, 'Opportunity recognition through social network characteristics of entrepreneurs,' *Frontiers of Entrepreneurship Research*. Wellesley, MA: Babson College.
- Stinchcombe, A. 1965, 'Social structure and organisations,' In *Handbook of organisations*, ed. J. March, 142–193. Chicago: Rand McNally.
- Stynes, D.J., & G.L. Peterson 1984, 'A review of logit models with implications for modeling recreation choices,' *Journal of Leisure Research*, **16**, 295-310
- Waldinger, R., H.E. Aldrich, & R. Ward, 1985, 'Ethnic business and occupational mobility in advanced societies,' *Sociology*, **19**, 586–97.
- Wennekers, A.R.M., & A.R.Thurik 1999, 'Linking entrepreneurship and economic growth,' *Small Business Economics*, **13**, 27-55.

Table 1: Variation in the level of opportunity recognition across 'residential areas'

		% that perceived opportunities
Whole sample	Rural location	20.4
	Urban location	24.8
	Big agglomeration	38.9
	Total	29.8
Belgium	Rural location	16.6
	Urban location	13.6
	Big agglomeration	18.8
	Total	16.7
Finland	Rural location	35.3
	Urban location	45.0
	Big agglomeration	57.9
	Total	51.2

Table 2: Descriptive statistics

	Mean	Std. Deviation	Minimum	Maximum
Opportunity recognition	0.3	0.4	0	1
Age	40.6	12.8	18	64
Gender	0.5	0.5	0	1
Education	2.3	0.7	1	3
Work status	0.7	0.5	0	1
Network closure	2.2	0.9	1	3
Country	0.3	0.5	0	1

Table 3: Correlation table

	1	2	3	4	5	6
1.Opportunity recognition	1.000					
2.Age	-0.007					
3.Gender	-0.077***	0.027				
4.Education	-0.114***	-0.132***	-0.041**			
5.Work status	0.026	-0.050***	-0.182***	0.003		
6.Network closure	0.176***	-0.030	0.027	-0.069***	-0.023	
7.Country	0.354***	0.018	0.004	-0.231***	0.020	0.277***

*** significant at $p \leq .001$

Table 4: Results of the logistic regression analyses (Dependent variable: Opportunity recognition)

Variables	Variable categories	Model 1		Model 2		Model 3		Model 4	
		Coefficient (std.error)	Wald	Coefficient (std.error)	Wald	Coefficient (std.error)	Wald	Coefficient (std.error)	Wald
Age		.001 (.003)	.07	-.002 (.004)	.38	-.002 (.004)	.27	-.001 (.004)	.05
Gender		-.281*** (.087)	10.36	-.307*** (.088)	12.04	-.312*** (.089)	12.18	-.353*** (.094)	13.99
Education	Secondary degree (base case)				55.89		45.15		19.53
	Some secondary			.652*** (.141)	21.34	.644*** (.143)	20.28	.137 (.153)	.79
	Post secondary			.692*** (.096)	51.92	.618*** (.098)	40.11	.448*** (.103)	18.77
Work status				<i>removed</i>		<i>removed</i>		<i>removed</i>	
Network closure	Big agglomerate (base case)						58.78***		16.65
	Rural location					-.760*** (.105)	52.34	-.398*** (.113)	12.47
	Urban location					-.548*** (.117)	22.07	-.382** (.123)	9.59
Country							1.477*** (.099)	224.79	
Constant		-.473* (.192)	6.05	-.790*** (.203)	15.22	-.409 ⁺ (.209)	3.82	-2.491*** (.099)	91.04
Model Chi-Square		10.473 [2]		68.369 [3]		128.210 [6]		362.251 [7]	
Block Chi-Square		71.6		57.896 [2]		59.841 [2]		234.041 [1]	
% correct predictions		71.6		71.6		71.6		73.3	

*** significant at $p \leq .001$; ** significant at $p \leq .01$; * significant at $p \leq .05$; ⁺ significant at $p \leq .10$

Table 5: Logit regression results for Finland: Opportunity recognition by geographic region

		Capital reg. & Uusimaa		South Finland		East Finland		Middle Finland		North Finland	
		Controls	Step1	Controls	Step1	Controls	Step1	Controls	Step1	Controls	Step1
Age		.008	.002	.012	.008	-.005	-.003	.005	.019	.060 ⁺	.029
Gender		.253	.425	.220	.331	.824*	.712 ⁺	-.295	-.512	-.076	-.426
Education	Secondary degree										
	Some secondary		-.587		.304		.515		-.332		-.052
	Post secondary		.074		-.252		.662		.481		.583
	Graduate degree		.841		.975*		.244		1.288*		.319
Work status			-.389		-.353		.239		-1.233**		-.551

Here we report the regression coefficients

*** significant at $p \leq .001$; ** significant at $p \leq .01$; * significant at $p \leq .05$; ⁺ significant at $p \leq .10$