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Social capital and entrepreneurship: An exploratory analysis

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This study explores the relation between social capital and entrepreneurship. We construct a measure of social capital which incorporates indicators of; trust (generalized and institutional); associational activities (passive and active membership); and civic norms. Self-employment is used as a proxy for entrepreneurship. Before empirically testing the relation between social capital and entrepreneurship, this study reviews the literature concerning the definition and measurements of social capital, the relationship between entrepreneurship and social capital, and explanations on how the different dimensions of social capital affect entrepreneurship. Results from an empirical model which simultaneously controls for factors which are theorized to affect entrepreneurship at both individual- and country-levels indicate that a positive relationship exists between social capital and entrepreneurship.

Key words: Social capital, entrepreneurship, self-employment, binomial logistic model.

INTRODUCTION

In the aftermath of the industrial revolution, the world economy has evolved into a knowledge-based economy, driven by rapidly changing technologies and markets. In this new economy: "knowledge is our most powerful engine of production" (Marshall, 1965, quoted in Cooke and Leydesdorff, 2006). The interrelationships between knowledge, innovation, and economic development have spurred efforts to better understand how knowledge contributes to economic development both within and between regions. This has, in turn, increased interest in how knowledge is created and transferred both within and between regions (Crosby, 2000; Dakhli and de Clercq, 2004).

The key elements of the knowledge economy include; actors' knowledge; intellectual property (patents); and actors' social networks (Lakshmanan, 1994; Castells, 1998; Miller, 2005; Westlund, 2006).[1] Some, like Smilor

and Wakelin (1990), call these elements "smart infrastructure" because they link talent, technology, capital, and know-how. Thus, the knowledge economy makes new demands on individual's qualifications which affect their relationship with their employers (Westlund, 2006). In addition, individuals in the knowledge economy are owners of the core production factor. Knowledge is non-productive if individuals don't use it. It also has attributes of a public good, given that it is imperfectly excludable and therefore subject to spillovers (Romer, 1990; Fisher and Varga, 2003; Westlund, 2006). Endogenous growth and knowledge spillover theory are fundamentally based on these characteristics of knowledge. These two approaches presume that knowledge is produced, used, and exchanged differently in different social systems.

In the knowledge economy, innovation and economic growth are vital to creating and transferring knowledge (Collinson, 2000). Future economic growth depends, to a large extent, on promoting innovation (Baumol, 2004). Thus, one of the basic questions in the knowledge economy is: What drives innovation and economic growth? Theories on innovation and economic growth show that investment in physical capital (Solow, 1957); human capital (Schultz, 1967; Lucas, 1988); and knowledge capital (Romer, 1986; 1990), are very important in prompting

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[1]The nature of the knowledge economy suggests that education and training are also important (Evoh, 2007).

innovation and economic growth.

Entrepreneurship theory emphasizes investment in entrepreneurial capital (Acs and Audretsch, 2003; Audretsch and Keilbach, 2004) to promote innovation and economic growth. Entrepreneurship involves the creation of new things and progress for profit (Schumpeter, 1942; Knight, 1971; Kirzner, 1973; Schultz, 1975). Creating something new includes "the creation of new organizations" (Gartner, 1988) and "the creation of new economic activity" (Davidsson et al., 2006). In particular, new economic activity may involve conversion of a new idea or invention into a successful innovation in the economy (Schumpeter, 1942) or imitation that is new to a firm (Hessels, 2008). Thus, entrepreneurship includes not only new firm creation, but also new economic activity by established firms. Therefore, it is in essence, about opportunity recognition and exploitation (Kirzner, 1979) and is associated with innovation and other entrepreneurial activities such as risk-taking and proactiveness (Covin and Slevin, 1989; Lumpkin and Dess, 1996; Hessels, 2008). Other research (Acs and Audretsch, 2003; Florida, 2005; Stimson et al., 2006; Acs, 2008) regards entrepreneurship as a knowledge filter serving as a conduit for knowledge spillovers from the organization producing the knowledge to the new organization commercializing that knowledge. The knowledge filter (K^c/K) is the gap between new knowledge (K) and economic knowledge (K^c) and can be defined as "a subset of institutions that hinder the commercialization of knowledge" (Acs, 2008). Entrepreneurship is one mechanism to penetrate this filter and stimulate knowledge flows. Thus, knowledge spillover theorists stress that entrepreneurship plays a key role in innovation and economic growth.

If entrepreneurship is a driver of innovation and economic growth, what conditions are necessary for entrepreneurship? According to Shane (2004), the necessary conditions include; entrepreneurial opportunities; differences in people's willingness and ability to respond to those opportunities; exploiting opportunities; taking on risk and uncertainty; and innovations that change the marketplace. For these conditions, entrepreneurial efforts to pursue radical or relatively incremental opportunities depend on "whether the discoverer was within or outside an existing firm and whether the exploiter is within or outside an existing firm" (Shane and Eckhardt, 2003). Entrepreneurship is also contingent upon "whether the individuals discovering an opportunity are employees or independent individuals, and whether new firms or incumbent firms are used for the exploitation of the opportunity" (Stam, 2008), given that the range of options and consequences of exploiting new opportunities are unknown because of risks and uncertainties in the marketplace. In this circumstance, social capital (networks) can be one of the key elements for individuals to identify new means-ends relationships (commercial opportunities) that result from environmental changes to

discover and exploit entrepreneurial opportunities. Through social networks, individuals can access useful information and knowledge and make decisions in response to a given set of alternatives based on acquired information and (formal and/or tacit) knowledge. Thus, social capital is essential for entrepreneurship, particularly in today's knowledge economy. In turn, the concept of social capital has recently gained prominence in regional studies and economic geography to help understand entrepreneurship in the era of the knowledge economy.

Audretsch and Keilbach (2004) argue that entrepreneurship is related to some aspects of social capital. Unfortunately, the empirical evidence to support the theorized link between social capital and entrepreneurship is inconsistent. This problem is at least partially attributable to the fact that there is no theoretically-justified measure of social capital that operationalizes the multidimensional nature of the concept. A multidimensional measure of social capital could help to better understand how social capital is related to entrepreneurship.

This study is designed to address this gap in the literature on social capital by creating a social capital index consisting of the following core constructs which are often associated with the concept: trust; associational activities; and civic norms. The social capital index is then used to simultaneously test the relation between social capital and entrepreneurship. Before empirically testing the relationship, the next part of the paper is a review of the literature concerning the definition and measurements of social capital, the relationship between entrepreneurship and social capital, and explanations on how the different dimensions of social capital affect entrepreneurship. This study is an exploratory analysis of the association of social capital and entrepreneurship.

SOCIAL CAPITAL AND ENTREPRENEURSHIP

Social capital

During the last two decades, a new concept of capital–social capital–has emerged to explain entrepreneurship in the knowledge economy. The literature on social capital argues that social capital plays an important role in a knowledge-driven economy (Dosi, 1988; Hofstede, 1991; Maillat and Lecoq, 1992; Maillat, 1995, 1998; Storper, 1995; Triandis, 1995; Knack and Keefer, 1997; Fountain, 1999) because it facilitates and promotes economic actors' acquisition of knowledge and useful information (Maskell, 2001; Landry et al., 2002). In addition, social capital promotes knowledge production and exchange in research, education, and commercial R&D processes (Westlund, 2006). Thus, social capital has been regarded as an important driver of entrepreneurship.

Although the concept is popular and is frequently discussed in the literature, there is still a lack of agreement on how to define and measure social capital. This is

perhaps due to the multidimensional nature of the concept (Beugelsdijk and van Schaik, 2005). Thus, as Adler and Kwon (2002) assert, defining and measuring social capital is left to the discretion of researchers and "whether they focus on the substance, the sources, or the effects of social capital." These authors go on to review various social capital definitions and suggest that these definitions can be categorized into three broad types. These types depend on whether they focus on an actor's relations with other actors (bridging view); on the structure of relations between actors within a collectivity (bonding view); or a combination of both perspectives. On the one hand, studies that adopted the bridging view perspective (Baker, 1990; Boxman et al., 1991; Belliveau et al., 1996; Burt, 1997a, b; Portes, 1998; Knoke, 1999) suggest that the actions of individuals or groups can be facilitated by their direct and indirect networking with other actors in the social network. On the other hand, studies that adopted the bonding view (Coleman, 1990; Portes and Sensenbrenner, 1993; Fukuyama, 1995; Putnam, 1995; Thomas, 1996; Brehm and Rahn, 1997; Inglehart, 1997) suggest that social capital is not only the result of the structure of the linkages between actors within the collectivity but is also the result of features that give the collectivity cohesiveness and its associated benefits and, thereby, facilitate the accomplishment of collective goals (Adler and Kwon, 2002). The third perspective is neutral between the bridging and bonding views because it describes these views as not being mutually exclusive. It implies that definitions can vary depending on the level of analysis; whether individual or group.

Despite the variety of definitions of social capital, several studies (World Bank, 1985; Coleman, 1990; Bourdieu and Wacquant, 1992; Fukuyama, 1995; Putnam, 1995, 2000; Onyx and Bullen, 2000; Adler and Kwon, 2002; Glaeser and Redlick, 2008) provide very useful definitions of social capital. For example, the World Bank (1985) defines social capital as "the norms and social relations embedded in social structures that enable people to coordinate action to achieve desired goals". Coleman (1990) defines social capital as something that is not a single concept, but a variety of different concepts consisting of some characteristics of social structure that facilitate certain actions by actors within the social structure. He also argues that social capital forms "an attribute of the social structure in which a person is embedded" and it is not "the private property of any of the persons who benefit from it". Bourdieu and Wacquant (1992) define social capital as "the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutional relationship of mutual acquaintance and recognition". Therefore, social capital facilitates an actor's specific activities in the social network. Putnam (1995) characterizes social capital as trust, network structures, and norms that promote cooperation among actors within

a society for their mutual benefit. Putnam (2000) also suggests that formal membership, civic participation, social trust (generalized trust), and altruism (volunteerism) are indicators of social capital. Fukuyama (1995) not only regards trust as the core construct of social capital but also suggests that trust can be accumulated by cooperation within the civic participation network. Onyx and Bullen (2000) discuss social capital in terms of trust, participation in networks, reciprocity, the commons, social agency, and social norms. Glaeser and Redlick (2008) suggest that social capital can be built through group membership and political activism. In reviewing these prior studies, it is generally agreed that social capital includes several core constructs, mutual trust; associational activities or membership (including cooperation and participation); and civic norms.

Trust

Dakhli and de Clercq (2004) categorize trust into two types; generalized and institutional. Generalized trust is related to how much people trust each other. Institutional trust is related to how much people trust organizations and institutions. The first type of trust captures the interpersonal facet of trust, and thus, it can be assumed to reduce uncertainty and facilitate interaction and communication (Sako, 1992; Beugelsdijk and van Schaik, 2005). The second type of trust captures the deterrent aspect of trust (Dakhli and de Clercq, 2004). Deterrence-based trust relates to the belief that efficient sanction mechanisms make the breach of contracts amongst actors costly. This, in turn, makes it possible for actors to cooperate and expect reciprocation (Rousseau et al., 1998; Dakhli and de Clercq, 2004). If people think their organizations or institutions contribute to the mediation of disputes and protect actors against breaches of contracts, they are more willing to interact with other actors. Previous research on trust suggests that trust both within and between organizations lessens the need for tight monitoring and control mechanisms and increases freedom from rigid rules (Quinn, 1979; Dakhli and de Clercq, 2004). This enhances idea generation by facilitating interactions between individuals within organizations and between organizations. According to Knack and Keefer (1997), if organizations within a country have a high level of mutual trust, confidential information exchange can be facilitated with other organizations. This is because the risk that one actor will opportunistically exploit confidential information to disadvantage another actor is reduced (Dakhli and de Clercq, 2004). Fukuyama (1995) regards trust and honesty as drivers for reducing transaction costs. Putnam (2000) argues that "a society that relies on generalized reciprocity is more efficient than a distrustful society" and "honesty and trust lubricate the inevitable frictions of social life". Thus, trust is considered one of the core values for social exchange and

communication.

Associational activity

Associational activity refers to the tendency for citizens to voluntarily join various types of organizations (Knack and Keefer, 1997; Dakhli and de Clercq, 2004). It reflects embeddedness in social networks and closure of the network. Coleman (1988, 1990) suggests that the closure of social networks and cohesive ties have positive effects on promoting a normative milieu that facilitates trust, cooperation, and interaction between actors. Putnam (1993a) also mentions that in regions where social relationships are more horizontal and based on trust, shared values, mutual support, and solidarity, there is greater participation in social organizations and a higher level of social capital. He argues that the level of trust and citizenship is positively affected by more dense social networks. This line of reasoning is related to Beugelsdijk and van Schaik's (2005) view that the benefits of embeddedness in social networks cannot be captured by passive membership, such as the number of organizations to which individuals belong, as a measure of associational activity. To validly capture the benefits of network embeddedness, they suggest that the level of organizational involvement must be considered. This can be ascertained by examining the degree to which individuals actively participate in the organizations to which they belong (active membership).

Civic norms

Civic norms refer to the general tendency of citizens to cooperate and weigh the public good against self-interest (Knack and Keeper, 1997; Dakhli and de Clercq, 2004). These informal mechanisms are often said to coexist with associational activities because, people who want to improve societal well-being may be more willing to participate in various activities. For example, they may be more willing to exchange information, ideas, and knowledge with others, and to try to reach a consensus on the ideal state that is best for all people (Dakhli and de Clercq, 2004). However, previous studies suggest that there are distinct components of civic norms and associational activities. For instance, Olsen (1982) argues that the main goal of some associations or organizations is to seek to maximize the benefits to their members and thus, associations or organizations operate as special interest groups. Furthermore, private profit maximizing by associations or organizations, increases social costs. Thus, it can be argued that the concept of civic norms is different from the concept of associational activities. The goal of associational activities depends on organizations, although being a member of an organization is related to associational activities and civic participation.

Social capital is generally defined in terms of the trust, groups, networks, and norms that people have at their disposal for productive purposes. However, a too high level of associational activity and trust can also have negative effects because of over embeddedness. The weakness of highly cohesive networks is a lock-in effect which hinders the inflow of new and non-redundant information into a region or a network of firms (Granovetter, 1973; Grabher, 1993; Flache and Macy, 1996; Uzzi, 1997). Thus, Portes and Landolt (1996) criticize the view of social capital that focuses only on positive effects without considering negative ones. In particular, Portes (1998) suggests "exclusion of outsiders, excess claims on group members, restrictions on individual freedoms, and downward leveling norms" (Portes, 1998) as negative effects of social capital. Paxton (1999) and Woolcock and Narayan (2000) also note that higher levels of social capital could restrict individual growth and societal development; therefore, further analysis on this aspect of social capital is needed to draw a full picture of its role in the knowledge economy.

The role of social capital in entrepreneurship

Research by Aldrich and Martinez (2003) and Audretsch and Keilbach (2004) contend that, theoretically, social capital plays an important role in entrepreneurship. Although a link between social capital and economic performance is supported by some empirical research (Putnam, 1993a, b, 1995, 2000)[2], Audretsch et al. (2006) argue that most of the research on social capital and entrepreneurship does not adequately link these two concepts. Thus, it has not been enough to explain the positive contribution of social capital to entrepreneurship empirically. In addition, the term entrepreneurial capital often appears in the literature to represent another form of capital besides physical or human capital (Audretsch and Keilbach, 2004). Sometimes, the definition of entrepreneurship capital is interpreted in a broad sense and, therefore, it includes social capital in its definition, although social capital and entrepreneurship are distinctly different concepts. This unfortunate choice of terminology is problematic because it can be confused with social capital which is generally defined in terms of the trust, group memberships, networks, or norms that people assume for productive purposes. [3]Entrepreneurship on the

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[2]Putnam (1993a, b, 1995, 2000) emphasized associational membership and public trust as important components of social capital especially with regard to the linkage between social capital and economic well-being.

[3]According to Audretsch et al. (2006), entrepreneurship capital refers to "[a] milieu of agents and institutions conducive to the creation of new firms. This involves a number of aspects, such as social acceptance of entrepreneurial behavior, individuals willing to deal with the risk of creating new firms, and the activity of bankers and venture capital agents willing to share risks and benefits. Hence, entrepreneurship capital reflects a number of different legal, institutional, and social factors and forces that create a capacity for entrepreneurial activity…entrepreneurship capital could be considered to constitute one particular subset of social capital" (p. 62).

other hand, is defined as "an action, process, or activity that involves the startup and growth of a new en-terprise" (Audretsch et al., 2006). Taken together, social capital and entrepreneurship are different concepts but theoretically, the former contributes to the latter. If social capital is an important determinant of entrepreneurship, then how does social capital affect entrepreneurship?

Based on previous theoretical and empirical research, Thornton and Flynn (2003) argue that social capital impacts entrepreneurship at three different levels of analysis; network ties between individuals; those connecting teams and groups; and those connecting firms and industries. They conclude that social networks make an important contribution to entrepreneurship considering that:

networks with cohesion in which trust is fostered are contexts in which information flows easily, characteristics that are central to reducing the risk of investment in inno-vation. Whether networks connect individuals, groups, or firms to one another, or tie together actors from two or more of these categories, they are contexts that provide the social, financial, and human capital that fosters entrepreneurship" (Thornton and Flynn, 2003: 424–425).

The social capital perspective presumes that network ties provide individuals or organizations with access to knowledge and other useful resources (Napahiet and Ghoshal, 1998; Davidsson and Honig, 2003; Elfring and Hulsink, 2003; Lechner and Dowling, 2003; Batjargal, 2007). Thus, social capital captures the networking between individuals or between individuals and organiza-tions as well as the useful resources which can be drawn from these networks (Hessels, 2008). In addition, networks not only affect the entrepreneurial process, they also create new opportunities by internalizing other actors' skills (Kogut, 1988; Hamel, 1991). For example, if venture ca-pital firms are members of a network, their participation is a signal of reduced risk for investors (Podolny, 2001). Also, these networks can provide market valuations for private firms such as biotechnology firms (Stuart et al., 1999).

The literature reviewed thus, shows that entrepreneurs recognize that social network principles can be practical and accessible solutions to start new firms or expand existing businesses (Kim and Aldrich, 2005). Because of the importance of these social networks, many individuals and organizations seeking to take advantage of entrepre-neurial opportunities develop social networks with other actors in the knowledge economy. In short, social capital can contribute to entrepreneurship because a high level of social capital can reduce transaction costs between actors, search and information costs, bargaining costs, and decision costs (Maskell, 2001; Landry et al., 2002).

In this study, trust (generalized and institutional), asso-ciational activities (passive and active membership), and civic norms are identified as the three core constructs that define social capital. The study seeks to tests the relation between social capital and entrepreneurship. In other words, this study tests the hypothesis that social capital is positively related to entrepreneurship (self-employment).

DATA AND METHODOLOGY

Data

This study suggests that trust (generalized and institutional), associational activities (passive and active membership), and civic norms are identified as the three core constructs that define social capital. These core constructs are used to create a theoretically-justified index of social capital. This study discusses the creation of this social capital index and then goes on to empirically test it's utility in predicting entrepreneurial behavior. The study tests the hypothesis that entrepreneurship is influenced by social capital. However, it is not easy to measure the level of entrepreneurial activity due to disagreements amongst scholars on the appropriate definition of entrepreneurship. In addition, this paper focuses on the relation between social capital and entrepreneurship at the individual-level, not at an aggregate-level like, the country- or the regional-level. Thus, aggregate measures of entrepreneurship used extensively in previous empirical studies, such as self-employment rates, business ownership rates, self-employment rates in skill-intensive sectors, self-employed entry and exit rates, the Global Entrepreneurship Monitor (GEM), and the Total Entrepreneurial Activity Index (Iversen et al., 2008) cannot be used as measures of entrepreneurship in this study. At the individual-level, previous studies typically use whether an individual is self-employed or not as an indicator of entrepreneurship (Acs et al., 1994; OECD, 1998; Le, 1999; Blanchflower, 2004; Parker, 2004; Parker and Robson, 2004). This definition of self-employment is compatible with the entrepreneurship theories of Knight (1971) and Kirzner (1973) which suggest that entrepreneurs are uncertainty bearers or profit and business opportunity finders. However it is not an appropriate indicator of Schumpeterian entrepreneurship, empha-sizing innova-tion. Additionally, if self-employment is not productive, it is not easy to say that it is entrepreneurship. In other words, it is necessary to differentiate types of entrepreneurship; productive; non-productive; and destructive (Baumol, 1990).[4] Thus, self-employment is not the best indicator of entrepreneurship. Although these problems are well-known, self-employment is used extensively as an indicator of entrepreneurship mainly due to its availability for most countries and partly due to the comparability of definitions across countries (Audretsch, 2002; Iversen et al., 2008). Considering the availability of data on entrepreneurship, this study also uses self employment as an indicator of entrepreneurship. The World Values Survey (WVS) which is used to measure individual-level, social capital in this study includes information on whether the respondent is self-employed or not. Thus, entrepreneurship is operationalized as self employment in this study.

Data are from the fifth wave of the WVS (World Values Survey Association, 2005). The WVS monitors social change in countries around the world by surveying individuals about their values, beliefs, and motivations. It is a random sample of individuals who participated in the country-studies. The data are based on face-to-face interview. The data include information on respondents from fifty-three countries. The empirical analysis on the effect of social capital on entrepreneurship is limited to adults aged twenty-five to seventy-four. Data at the country-level is used to control for the effects of income inequality, ease of doing business, employment opportunities, and taxation on entrepreneurship.

The dependent variable is a discrete, binary variable which equals 1 if the respondent is self-employed, 0 otherwise. Self-

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[4] Self-employment is often highly correlated in developing countries with non-productive entrepreneurship.

Table 1. Description of dependent and independent variables.

Variable			Description	Source(s)
Dependent	Entrepreneurship		Self-employed 1 = Self-employed 0 = otherwise	World Values Survey Association (2005)
Independent	Individual-level	Age 25-34	1=Age 25-34, 0=otherwise	
		Age 35-44	1=Age 35-44, 0=otherwise	
		Age 45-54	1=Age 45-54, 0=otherwise	
		Age 55-64	1=Age 55-64, 0=otherwise	
		Age 65-74	1=Age 65-74, 0=otherwise	
		Male	1=Male, 0=Female	
		Income	The higher value, the higher income	
		Family savings	1=Saved money last year, 0=otherwise	
		Education	1=University level education with degree, 0=otherwise	
		Parent immigration	1= Mother and/or father are immigrants, 0=otherwise	
	Country-level	GDP per capita	Natural log value of GDP per capita (PPP US$) in 2005	UNDP[1]
		Income inequality	GINI Index in 2005	UNDP[1]
		Unemployment rate	Unemployment rate (%) of total labor force in 2005	UNDP[1]
		OECD Membership	1=OECD country, 0=otherwise	OECD[1]
		Business environment	1=Business environment is above average, 0=otherwise[2]	World Bank[1]
		Tax rates	Total tax rates (% of profit)[2]	

[1]Data are collected from the following sources: UNDP (http://hdr.undp.org); OECD (http://www.oecd.org); and the World Bank (http://rru.worldbank.org); [2]Data is from *Ease of Doing Business 2007* (World Bank and International Finance Corporation 2006). Business environment equals 1 if the ease of doing business is above average.

employment is therefore used to operationalize entrepreneurship. The independent variables control for factors which have been shown to affect entrepreneurship at both the individual- and country-level.[5] At the individual-level, age, gender, income, family savings, education attainment, and immigration status affect entrepreneurship. At the country-level, Gross Domestic Product (GDP) per capita, Organization of Economic Co-operation and Development (OECD) membership, income inequality, unemployment rate, total tax rates, and business environment affect entrepreneurship.[6] The business environment variable is the first of eleven components extracted from the thirty-six variables in the Ease of Doing Business 2007 database (World Bank and International Finance Corporation, 2006) via principal components analysis. The business environment dummy variable equals 1 if the first component for a country is above average, 0 otherwise.[7] Table 1 describes the dependent variable and the independent variables at both the individual- and country-level.

Social capital index

Numerous measures of social capital at the country-level appear in the literature (Knack and Keefer, 1997; Whiteley, 2000; Bjørnskov and Svendsen, 2003; Dakhli and de Clercq, 2004; Beugelsdijk and van Schaik, 2005). For example, Narayan and Pritchett (1999) and Krishna and Uphoff (1999) use 'generalized trust' and 'voluntary

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[5]This study cannot control for other factors such as parental entrepreneurship (Davidsson and Honig, 2003) or fear of failure (Arenius and Minniti, 2005) which often affect entrepreneurial activity) because these variables are not included in the WVS.

[6]The Doing Business Project (World Bank and International Finance Corporation, 2008) provides measures of the business environment in different countries such as regulations and their enforcement across 181 economies. They also produce an annual report known as the *Ease of Doing Business* which includes measures of the business environment in different countries. The measures include ten categories such as: starting a business; dealing with construction permits; employing workers; registering property; getting credit; protecting investors; paying taxes; trading across borders; enforcing contracts; and closing a business.

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[7] The first component includes six variables: minimum capital when people start a business (% of income per capita); cost of registering property (% of property value); time for export (days); cost to export (US$ per container); time for import (days); and cost to import (US$ per container) (World Bank and International Finance Corporation, 2006).

Table 2. Social capital measures using world values survey data.

Constructs		Knack and Keefer (1997)	Whiteley (2000)	Bjørnskov and Svendsen (2003)	Dakhli and de Clercq (2004)	Beugelsdijk and van Schaik (2005)
Trust	Generalized trust Institutional trust	Percentage (1)[1]	Score (3)	Percentage (1)	Percentage (1) Average score (16)	Percentage (10)
Associational activity (Membership)		Average number of memberships per respondent (10)		Average number of memberships per respondent (16)	Average score (9)	Average number of passive (15) and active (15) memberships
Norms of civic behavior		Average score (5)			Average score (5)	
Methodology		Used each component separately	Used mean factor scores calculated for all of the respondents in each country	Used each component separately	Used each component separately	Used factor scores from factor analysis
Cases		29 countries	34 countries	32 countries	59 countries	54 regions in 7 countries
Sources		World Values Survey (1990)	World Values Survey (1995)	World Values Survey (1995)	World Values Survey (1995)	European Values Survey (1990)

[1]The numbers in parentheses refer to the number of survey items used in creating each construct of social capital.

organization membership'; Brehm and Rahn (1997) use 'generalized trust', 'trust in government', and 'civic participation'; Rose (1999) uses 'network' and 'trust in government'; and Putnam (1993a) and Grootaert (1999) use 'voluntary organization member-ship' as social-capital measures. However, because these authors use different data sources, it is difficult to compare one social-capital measure with another. To address this limitation, this study focuses on those social capital measures that used WVS data. Table 2 summarizes the methodologies used to develop social capital measures with WVS data.

The limitations of these methodologies are discussed thus. Knack and Keefer (1997) do not consider institutional trust and thus failed to produce a social capital measure that incorporates all three constructs of social capital. Whiteley (2000) only considers gene-ralized trust as a social-capital measure. Bjørnskov and Svendsen (2003) consider generalized trust and membership in their measure of social capital, but they did not include institutional trust and norms of civic behavior as social-capital constructs. Instead, they used corruption and economic freedom (Freedom House, 2002)[8] as indicators of political rights and civil liberties in their measure of social capital. Dakhli and de Clercq (2004) consider the institutional trust construct in their model of social capital. However, their social capital measure is not robust because they failed to find statistically significant correlations between items indicating associational acti-vity and norms of civic behavior. Beugelsdijk and van Schaik (2005) used factor analysis to create a measure which incorporates all three constructs of social capital. However, they only consider ge-neralized trust and associational activity as constructs of social ca-pital. Therefore, they too failed to produce a social capital measure

which incorporates all three constructs. Overall, previous measurement efforts have tried, but failed to incorporate all three of the core constructs of social capital into one measure.

In order to fully understand how social capital relates to entre-preneurship, it is important to produce a social-capital measure that incorporates all three of its core constructs. To incorporate all three of the core constructs of social capital into one index, WVS data was used to create three scores; 1) trust; 2) associational activity; and 3) civic norms. The trust score is the mean of scores on generalized and institutional trust for all of the respondents in each country. The generalized trust score is based on five items which gauge how much respondents trust other people. Respondents can choose a number from 1 (trust completely) to 4 (no trust at all) for all five items. The scales for all five items are reversed so that larger values reflect more generalized trust. The values are ave-raged over the five items to create a generalized trust score for all of the respondents in each country. The institutional trust score is based on six items which gauge how much confidence respondents have in a variety of organizations or institutions, such as the government or parliament (Knack and Keefer, 1997; Dakhli and de Clercq, 2004). Respondents can choose a number from 1 (a great deal of confidence) to 4 (no confidence at all) for all six items. The scales for all six items have been reversed to ensure that larger values denote greater institutional trust. The values are averaged over the six items to create an institutional trust score. Finally, the generalized and institutional trust scores are averaged to create a trust score.

The associational activity score is the mean of scores on passive and active memberships. Passive and active memberships are based on items which ask respondents if they are passive or active members of various organizations, including professional associa-tions or political parties (Knack and Keefer, 1997; Dakhli and de Clercq, 2004; Beugelsdijk and van Schaik, 2005). The numbers of both types of organizational memberships are used to create

[8] Freedom House (www.freedomhouse.org), a non-profit, publishes an annual assessment of economic freedom in the world. Each country is categorized as: free; partly free; or not free by averaging overall ratings on political rights and civil liberties.

Table 3. Creating the social capital index (SCI).

Construct		Description	Index
Trust (TR)	Generalized Trust (G)	Average of five items[1]; score is replaced by a 100-point scale.	TR = (G+I) / 2
	Institutional Trust (I)	Average of six items[2]; score is replaced by a 100-point scale.	AA = (A+P) / 2
Associational activity (AA)	Active membership (A)	Average number of memberships[3] cited for each country's respondents; score is replaced by a 100-point scale.	
	Passive membership (P)	Average number of memberships[3] cited for each country's respondents; score is replaced by a 100-point scale.	SCI = (TR+AA+CN) / 3
Civic norms (CN)		Average of four items on civic behaviors[4]; score is replaced by a 100-point scale.	

[1]The five items refer to your neighborhood, people you know personally, people you meet for the first time, people of another religion, and people of another nationality; [2]The six items refer to the armed forces, the press, labor unions, the police, parliament, and the civil service; [3]The eight groups are religious organizations; organizations for education, arts, music, or cultural activities; labor unions; political parties; human rights organizations; conservation organizations; environmental, ecological, and animal rights organizations; professional associations; and sports or recreational organizations; [4]The four civic behaviors are: claiming government benefits to which you are not entitled; avoiding a fare on public transportation; cheating on your taxes; and accepting a bribe.

create passive and active associational activity scores for all of the respondents. Finally, the passive and active associational activity scores are averaged to create an associational activity score.

The civic norms score is the mean of scores on norms of civic behavior. Borrowing from previous research on civic norms (Knack and Keefer, 1997; Dakhli and de Clercq, 2004), the norms of civic behavior score is based on a respondent's assessments of whether or not four behaviors can; always be justified; never be justified; or something in between. The four civic behaviors include: 1) claiming government benefits to which you are not entitled; 2) avoiding a fair on public transportation; 3) cheating on your taxes; and 4) accepting a bribe. Respondents can choose a number from 1 (never justifiable) to 10 (always justifiable) for all four items. The scales are reversed so that larger values designate greater norms of civic behavior. The values are averaged over the four items to create a civic norms score.

It is generally accepted that applying the appropriate weighting scheme is a crucial aspect of index building. Some indexes such as the Global Competitiveness Index use a methodology including econometric techniques to estimate the appropriate weighting scheme (Acs and Szerb, 2009). However, weighting schemes are not used to create most indexes although the reality is that one element is much more important than the others. This is because researchers want to avoid the accusation that they are relying on arbitrary methodologies. In addition, equal weighting makes it relatively easy for researchers to create an index and for readers to interpret them. In this study, unweighted and weighted indexes were created because there is no well-established weighting scheme for creating a social capital index. Four social capital indexes were created which weigh trust (generalized and institutional), associational activities (active and passive membership), and civic norms differently. Each of the four social indexes was then used to analyze its effects on entrepreneurship. Because the effects of the unweighted and weighted indexes were indistinguishable, one of the un-weighted social capital indexes was used in the analysis to make it easier to interpret the results. However, it is important to consider that the weights used in this study might be too narrow or too broad to capture reality. In short, the effects of the unweighted and weighted social capital indexes on entrepreneurship depend on the weights used in this study. Thus, determining the appropriate weighting scheme remains an unresolved issue in this paper. Nonetheless, this study is an exploratory analysis of the impacts of social capital on entrepreneurship. For this reason, the focus is on the relationship between social capital and entrepreneurship using four different unweighted and weighted social capital indexes. This endeavor is one of the major contributions of this paper to the current empirical literature linking social capital to entrepreneurship. For the social capital index used in the analysis, the scores on all three constructs of social capital are replaced by a 100-point scale. The construct scores were then averaged to produce social capital index. This procedure would only be justified if the items would belong to scales which have been developed to measure these constructs. Thus, this study estimates for internal consistency to evaluate reliability of these constructs based on Cronbach's α. By reliability tests, all of the Cronbach's α value of each core construct are above 0.8.[9] Thus, this study uses all three constructs of social capital and the social capital index as a proxy of social capital. Table 3 describes how this social capital index was created.

[9] This study also performed a factor analysis in order to see if variance in our observed variances truly reflects variance in a single unobserved factor. Factor analysis also shows that the items are categorized into three factors therefore we labeled trust, associational activities, and civic norms, respectively.

Empirical model

As mentioned earlier, the dependent variable in this study is a discrete, binary variable which equals 1 if the respondent is self-employed, 0 otherwise. Thus, a binomial logistic regression model is estimated to analyze how social capital influences the likelihood that an individual is self-employed after controlling for some individual-level and country-level characteristics. The model is:

$$P(Y_i = 1 | X_{1i},...,X_{ji}) = \frac{1}{1 + \exp(-\beta_0 - \beta_1(\mathrm{SCI}_i) - ,... - \beta_j X_{ji})},$$

or

$$\ln[P_i/(1-P_i)] = \beta_0 + \beta_1(\mathrm{SCI}_i) + \sum_{j=2}^{n} \beta_j X_{ji}$$

where $P(Y_i = 1, X_i)$ is the probability that individual i is self employed; Y_i equals 1 if respondent i is self-employed, 0 otherwise; β_j's are the coefficients for each independent variable; SCI_i represents the social capital index for each individual i; and X_{ji} is a vector of independent variables that influence the probability that an individual is self-employed.

The vector of independent variables includes; educational attainment; wealth (income and family savings); demographic characteristics (gender and age); and immigration status at the individual-level and GDP per capita; OECD membership; income inequality; unemployment rate; total tax rate; and business environment (ease of doing business) at the country-level.

RESULTS AND DISCUSSION

Descriptive statistics

Before exploring the relationship between social capital and entrepreneurship using logistic regression analysis, descriptive statistics regarding the individual-level characteristics of respondents, the social capital index and its constructs as well as country-level characteristics are discussed. Table 4 presents descriptive statistics regarding characteristics of all respondents and two groups; 1) self-employed; and 2) not self-employed. Table 4 shows that there is a gap between Group 1 (self-employed) and Group 2 (not self-employed). The self-employed group has slightly higher levels of social capital than the other group (not self-employed group). In particular, the self-employed group has slightly higher levels of (passive and active) membership and civic norms than the other group. Table 4 also shows that the individual-level characteristics of the two groups differ. As expected, incomes are slightly higher in the self-employed group. However, the two groups differ substantially on educational attainment, demographic characteristics, and immigration status as well as some country factors. Comparison of the individual- and country-level characteristics in Table 4 suggests that entrepreneurship is influenced by both individual- and country-level characteristics. Therefore, it is likely that the gaps between the two groups on the social capital index are at

least partially attributable to differences in the individual- and country-level characteristics of the two groups.

Binomial logistic regression results

Table 5 summarizes how social capital associates with entrepreneurship. According to Model (1), 'Generalized Trust' has a negative and statistically significant influence on entrepreneurship at the 1% level. However, 'Institutional Trust' has a positive and statistically significant influence on entrepreneurship at the 10% level. These results imply that trust does not always be associated with entrepreneurship.

It seems that trust plays a role in determining the nature and extent of entrepreneurship, even though its role depends on regional environments (Ledeneva, 1998; Welter et al., 2003). For associational activities, the passive-membership coefficient is positive, but not statistically significant. However, the active-membership coefficient is positive and statistically significant at the 5% level. These results imply that as associational activities increase, the probability of entrepreneurship increases as well. Civic norms are positively associated with entrepreneurship. These results support previous studies which suggest that civic norms are important factors in entrepreneurship (Portes and Sensenbrenner, 1993; Grannovetter, 2000; Swedberg, 2000; Stathopoulou et al., 2004; Warner and Daugherty, 2004).

In terms of the impact of educational attainment, university graduation is negatively associated with entrepreneurship. These results are not in line with previous studies that have regarded educational attainment as an important factor in entrepreneurship (Lazear, 2002; van der Sluis and van Praag, 2004; Zhang, 2008). Some literature argues that education makes individuals more risk averse because they know more and have greater insight, thus increasing their risk perception. Of course, it does not matter if the risk is not so great because people decide on risk perception which can be affected by education level, that is, too much. Further, type of entrepreneurship may be a factor here so that if there is a lot of unproductive entrepreneurship as measured by self-employment then the relationship found in this study with education should hold. This is why Baumol (1990)'s typology of entrepreneurship is important for interpreting the results of this study. But, it is not possible to find the type of entrepreneurship as measured by self-employment in this study due to the unavailability of data. Thus, more research on this issue is needed to provide both better measures of the different aspects of entrepreneurship and to further clarify the relationship between social capital and entrepreneurship.

For the other individual-level characteristics, the direction and statistical significance of the coefficients are similar. For example, income and family savings are positively associated with entrepreneurship. Males are 1.842 times more likely to be self-employed than females

Table 4. Descriptive statistics.

Variable	All respondents		Self-employed		Not Self-employed	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Entrepreneurship						
Self-employment	0.15	0.36	-	-	-	-
Social capital						
Generalized trust	63.01	13.99	62.17	14.09	63.16	13.97
Institutional trust	62.51	15.44	63.18	16.25	62.39	15.28
Passive membership	13.53	21.19	13.82	21.71	13.48	21.09
Active membership	9.95	15.42	10.52	16.13	9.85	15.28
Civic norms	84.78	20.10	86.02	16.92	84.56	20.62
Social capital index (SCI)	53.09	9.57	53.62	8.87	53.00	9.69
Educational attainment						
University graduation	0.16	0.37	0.09	0.29	0.17	0.38
Wealth						
Income	4.92	2.20	4.99	2.14	4.91	2.21
Family savings	0.30	0.46	0.31	0.46	0.30	0.46
Demographic characteristic						
Male	0.51	0.50	0.63	0.48	0.49	0.50
25-34	0.29	0.45	0.26	0.44	0.29	0.45
35-44	0.26	0.44	0.32	0.46	0.25	0.43
Age 45-54	0.21	0.41	0.23	0.42	0.21	0.41
55-64	0.15	0.36	0.13	0.34	0.15	0.36
65-74	0.10	0.29	0.05	0.22	0.10	0.30
Immigration status						
Parent immigration	0.03	0.18	0.03	0.17	0.04	0.19
Country factor						
GDP per capita	9.18	1.04	8.77	1.03	9.25	1.03
OECD membership	0.20	0.40	0.13	0.34	0.21	0.41
Income inequality	38.07	9.32	40.02	7.58	37.72	9.56
Unemployment rate	8.56	6.00	6.92	5.09	8.86	6.10
Total tax rate	44.22	12.21	43.46	12.37	44.36	12.17
Business environment	0.27	0.44	0.37	0.48	0.25	0.43
Number of observations	23,243		3,588		19,655	

and gender is an important factor when considering the relationship between social capital and entrepreneurship.

Table 5 also summarizes the relation between social capital and entrepreneurship after controlling for country factors as well as individual-level characteristics. The log odds of someone being an entrepreneur (logit (p)) increases by about 0.616 if they are male after controlling for country factors as well as individual-level characteristics. In other words, if someone is male they are 1.852 times as likely to be an entrepreneur ($e^{+0.616}$ = 1.852). The results by Model (3) also indicate that the log odds of

someone being an entrepreneur (logit (p)) decreases by about 0.616 if they have a university degree after controlling for country factors as well as individual-level characteristics. In other words, if someone has a university degree they are 0.540 times as likely to be an entrepreneur ($e^{-0.616}$ = 0.540). This effect appears to be high; just like the effect of gender. Thus, this study estimates the relation between social capital index and entrepreneurship by gender and education attainment and the results are summarized in Table 6.

These results indicate that there is a positive and

Table 5. Binomial logistic regression model: Log odds of self-employment.

Variable	Model (1)	Model (2)	Model (3)
Social capital			
Trust			
Generalized trust	−0.0049809***		
Institutional trust	+0.0021256*		
Membership			
Passive membership	+0.0003906		
Active membership	+0.0027188**		
Civic norms	+0.0052081***		
Social capital index (SCI)		+0.0083717***	+0.0065***
Educational attainment			
University graduation	−0.8358167***	−0.8457673***	−0.6163***
Wealth			
Income	+0.0264865***	+0.0244529***	+0.0111
Family savings	+0.0978971**	+0.0855178**	+0.1668***
Demographic characteristic			
Male	+0.6110960***	+0.6088647***	+0.6156***
35-44	+0.3229137***	+0.3169829***	+0.4639***
Age 45-54	+0.1690488***	−0.1607060***	+0.3941***
55-64	−0.0588619	−0.0723458	+0.2414***
65-74	−0.6444367**	−0.6620466***	−0.2995***
Immigration status			
Parent immigration	−0.2195142**	−0.2396027**	−0.2007*
Country factor			
GDP per capita			−0.3842***
OECD membership			+0.2761***
Income inequality			+0.0461***
Unemployment rate			−0.0980***
Total tax rate			−0.0026*
Business environment			+0.1454***
Constant	−2.4592790***	−2.583036***	−0.1816
Number of observations	23,243	23,243	23,243
Log likelihood	−9655.1966	−9670.0097	−9017.5478
LR chi^2	688.51	658.88	1963.80
Prob > chi^2	0.0000	0.0000	0.0000
Pseudo R^2	0.0344	0.0329	0.0982

* $P < 0.1$; ** $P < 0.05$; and *** $P < 0.01$.

indicators of trust, associational activities, and civic norms is one of the major contributions of this study to the current empirical literature linking social capital to entrepreneurship.

Results from binomial logistic regression models indicate that there is a positive relationship between someone's social capital and their propensity for entrepreneurship; someone with a high level of social capital is more likely to be an entrepreneur than someone with a low level of social capital. In particular, the empirical results indicate that active membership and civic norms are important factors in entrepreneurship, but that trust does not always have a positive association with entrepreneurship. The descriptive statistics also highlight

Table 6. Binomial logistic regression model: Log odds of self-employment by gender and educational attainment.

Group Variable	Male		Female	
	With University Degree	Without University Degree	With University Degree	Without University Degree
Social capital				
Social capital index (SCI)	−0.0094	+0.0045	−0.0218*	+0.0138***
Wealth				
Income	−0.0208	−0.0044	+0.0683	+0.0175
Family savings	+0.1456	+0.1673***	−0.0215	+0.2249***
Demographic characteristic				
Age 35-44	+0.6055***	+0.3675***	+0.9210***	+0.5412***
45-54	+0.6104***	+0.3728***	+0.6117*	+0.3892***
55-64	+0.2239	+0.1557*	+1.1856***	+0.2909***
65-74	−0.9288*	−0.4172***	+0.2672	−0.0726
Immigration status				
Parent immigration	−1.4477**	−0.0880	−0.2057	−0.2378
Country factor				
GDP per capita	+0.0261	−0.4265***	−0.0993	−0.3898***
OECD membership	+0.3438*	+0.4747***	+0.6236**	−0.2795**
Income inequality	+0.0331***	+0.0455***	+0.0343***	+0.0525***
Unemployment rate	−0.0489***	−0.0951***	−0.0098	−0.1157***
Total tax rate	+0.0204***	+0.0015	+0.0153*	−0.0138***
Business environment	+0.0501	+0.2227***	+0.3356	+0.0162
Constant	−3.8160***	+0.7995**	−3.7939**	−0.1494
Number of observations	1,961	9,860	1,731	9,691
Log likelihood	−673.2371	−4582.0131	−360.2848	−3296.7512
LR chi^2(15)	63.18	876.09	38.20	765.77
Prob > chi^2	0.0000	0.0000	0.0005	0.0000
Pseudo R^2	0.0448	0.0873	0.0503	0.1041

*$P < 0.1$; **$P < 0.05$; and ***$P < 0.01$.

several important points. The self-employed group has a higher level of social capital than the other group (not self-employed group). Specifically, the self-employed group has a higher level of (passive and active) membership and civic norms than the not self-employed group. In addition, the percentage of self-employed with a university degree is about 10 percentage points lower than that for the not self-employed group and the percentage of males in the self-employed group is about 15 percentage points higher than that for the not self-employed group. Comparison of individual-level characteristics and country factors between the self-employed and not self-employed groups indicates that entrepreneurship may be affected by both.

The empirical results also indicate that gender and educational attainment are important factors when considering the relationship between social capital and entrepreneurship. They indicate that there is a positive and statistically significant relationship between social capital and entrepreneurship only for females without a university degree. This is a very interesting result because less-educated women typically have limited resources to open their own businesses and limited access to useful information for their economic activities. In addition, this group has traditionally not been the focus of government policies to promote entrepreneurship. These results suggest that government policies, to help make their social and institutional environments more favorable, would help promote entrepreneurship amongst women with low levels of educational attainment. This could be accomplished by organizing women's unions or social networks.

Overall, the results of this study indicate that government policies designed to create and accumulate social

capital should seek to increase cultural openness and diversity in a community or region. Cultural openness and diversity can provide people with more opportunities to participate in various social networks and to access useful information for their economic activities via intercultural communication. Additionally, by investing money in governmental institutions to raise trust in these institutions or by fighting corruption to raise civic norms, governments could also promote social capital. By promoting bridging and bonding via social networks, governments would also be promoting entrepreneurship.

For future consideration, more research is needed on the issue of the type of entrepreneurship, such as productive, unproductive, and destructive entrepreneurship mentioned by Baumol (1990). This would provide both better measures of the different aspects of entrepreneurship and further clarify the relationship between social capital and entrepreneurship. Using self-employment as an indicator of entrepreneurship has some limitations without considering the type of entrepreneurship. In addition, it would help to determine the appropriate weighting scheme to produce a social capital index. Finally, there is also the issue of endogeneity. Social capital might lead to entrepreneurship and economic growth, but it could also be the other way around or completely different. It might be the case that economically advanced countries the level of associational activities is low, because the welfare state takes over that many tasks private organizations or family used to do (for example, elderly care). Thus, future study needs to consider this issue in detail.

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