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The interplay of human and social capital in entrepreneurship in developing countries: The case of Uganda

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The Interplay of Human and Social Capital in Entrepreneurship in Developing Countries

The Case of Uganda

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and Arthur Sserwanga³

March 2009

Abstract

This paper discusses the characteristics and determinants of entrepreneurial behaviour in Uganda. It is based on a recent survey of urban and rural entrepreneurs, executed in May 2008. The main dependent variables are business success, gestation activities and innovative performance. The paper focuses in particular on the interplay of human and social capital in determining entrepreneurial performance. A prominent question in the literature is whether human capital and social capital act as complements or substitutes in furthering entrepreneurial dynamism.

We find that Ugandan enterprises are predominantly very small and not very dynamic. Most enterprises are young, with little or no growth of employment since start-up. Only a very small subset of sample entrepreneurs could be classified as entrepreneur in the dynamic Schumpeterian sense. .../.

Keywords: social capital, human capital, entrepreneurship, developing countries

JEL classification: D85, L26, L25, O31

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Our data contradict the network compensation hypothesis, which suggests that there is a trade-off between investing scarce time, energy and resources in the accumulation of human capital or in building social capital. With regard to complementarity or substitution between social and human capital, we find complementarity between access to network resources and years of education as determinants of gestation activities and substitution between network access and years of education as determinants of innovative performance.

An important general insight emerging from our analysis is the need to distinguish between two social capital dimensions: network size and access to network resources. Controlling for access to network resources, network size is either nonsignificant or significantly negative in influencing various dimensions of entrepreneurial performance. In the case of innovative behaviour, the size of a network is even an obstacle to entrepreneurial dynamism and can be perceived as a kind of negative social capital.

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Acronyms

GEM Global Entrepreneurship Monitor
TEA total entrepreneurial average index

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1 Introduction

This paper discusses the role and interplay of human and social capital in entrepreneurial performance in developing countries. Human capital refers to the knowledge and skills that economic actors have acquired, which can be employed for productive purposes, thereby generating income. So far, there is no general agreement on the concept of social capital and its definition (cf., Akcomak and ter Weel 2006). In this paper it is understood as the immaterial and material resources that accrue to a group or individual by virtue of having a durable network of relationships. In recent decades both forms of capital have been used jointly in the study of a variety of topics, such as school performance (Coleman 1988), firm dissolution (Pennings, Lee and Witteloostuijn 1998), organizational advantage (Nahapiet and Ghoshal 1998), and innovation at the country level (Dakhli and De Clercq 2003).

Entrepreneurship scholars have recently also started to pay attention to the interplay of human and social capital (Honig 1998; Brüderl and Preisendörfer 1998; Renzulli, Aldrich and Moody 2000; Anderson and Miller 2003; Davidson and Honig 2003; Bosma et al. 2004, Mosey and Wright 2007). But although important work has been done, the literature on the role of human and social capital in entrepreneurship is still limited and in some cases contradictory. Many studies do not address the interactions between human and social capital. Some entrepreneurship scholars argue that human capital and social capital are substitutes, while others see them as complements. Brüderl and Preisendörfer (1998) state that social capital compensates for shortcomings in human capital, and Piazza-Georgi (2002) concludes that investment in human capital leads to a loss in social capital, since one is unable to invest simultaneously in both forms of capital. In the classical sociological literature, human and social capital are seen as complements, just as human and physical capital are increasingly seen as complements in the economic literature on growth and productivity (Abramovitz 1989; Szirmai 2008). Human capital is effective only in the 'right' social context (Coleman 1988; Burt 2001).

A second shortcoming in the entrepreneurship literature is its focus on human and social capital in the advanced economies, while it has been argued that these aspects are critically important for developing countries (Woolcock 1998). This neglect of the developing countries is said to be a flaw in the entrepreneurship literature in general (Naudé 2007; Bruton, Ahstrom and Obloj 2008).

In this paper we want to address these shortcomings by focusing on the effects of human and social capital on entrepreneurship in developing countries. We focus in particular on the interactions between human and social capital. The analysis is based on a recent large-scale survey of micro enterprises in Uganda.

2 Literature review

2.1 Human and social capital

Reflecting our increasing understanding of the processes of economic growth and development, the concept of capital has gradually been broadened over time. In the 1950s, the emphasis was on physical capital accumulation and its contribution to

economic growth, but capital accumulation left large portions of growth unexplained. In the 1960s and 1970s, Denison, Schultz and Becker introduced the notion of human capital, where investment in education and the quality of labour were seen at least as important as investment in physical capital goods. Social capital originates in sociology and forms an interesting bridge between the disciplines of economics and sociology. It refers to social resources that can be drawn upon in the process of entrepreneurship and production. Parallel to the emergence of the concept of social capital, economists started introducing terms such as 'absorptive capacity', 'networks' and 'social capabilities' which emphasize the social framework in which human and physical capital can productively be employed. Social capital also drew attention to the role of the entrepreneur, who had disappeared into the black box of the modern economic production function. In the Schumpeterian tradition, the entrepreneur is the key actor in economic development who creatively combines resources to create new economic activities, new products, new markets and new combinations of inputs.

Contrary to the concept of human capital, which is by now widely accepted, social capital is still a somewhat contested concept. Economists such as Arrow and Solow have questioned whether social relations are true forms of capital, since relationships are not the result of investment and are difficult to quantify in cost-benefit analysis. Other authors counter that this criticism could just as well be directed at human capital (e.g., Westlund and Bolton 2003). Besides critical voices, there are those who celebrate social capital as a promising unifying concept. For instance, Woolcock (1998: 153-4) believes that the concept of social capital can serve as a bridge between theories and disciplines:

The idea of social capital is both appealing and promising precisely because it offers a potential strategy for obviating these concerns while bridging theoretical and disciplinary divides.

However, precisely the advantage of being a relatively broad, unifying and open concept has also been mentioned as one of its main weaknesses, since social capital has so many different interpretations (see for reviews Woolcock 1998; Portes 1998; Adler and Kwon 2002; Westlund and Bolton 2003; Akcomak and ter Weel 2006). Definitions vary depending on whether they focus on the substance, the sources, or the effects of social capital. Some definitions focus attention on the macro level, indicating that trust and social capabilities influence the performance of regions and nations. Other definitions emphasize the social capital of actors at the micro level. Definitions may also vary depending on whether they focus on relations, the structure of relations or the type of linkages (Adler and Kwon 2002).

Although there are significant differences in the definition of social capital, there are also similarities. One set of definitions can be summarized as resources that are potentially available from one's social ties. People can invest their scarce time and resources in strengthening their social ties and networks. Another set of definitions focuses on trust and norms as the solution to collective action problems. In this article we side with the former perception and adopt the view of Bourdieu, who gave the first systematic contemporary analysis of social capital. Bourdieu (1985: 248) defines the concept as:

The aggregate of the actual or potential resources which are linked to the possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition.

This also implies a choice for the micro level. We focus on the social capital of entrepreneurial actors.

2.2 Selected empirical studies on the role of human and social capital in entrepreneurship

Human and social capital effects are important in immigrant self-employment and intergroup variation in business ownership in advanced economies (Sander and Nee 1996). Often the human capital of immigrants accumulated in the country of origin is under-valued. Consequently immigrants turn to their common ethnic group, i.e., their social capital, for employment and support. Sanders and Nee (1996) emphasize the role of family as social capital for the immigrant. Using an unusually large existing database of about 40,000 immigrants in New York and Los Angeles, these authors find that both family composition and individual human capital are important determinants of self-employment.

But in the context of developing countries, the evidence on the role of family and kinship ties is mixed. It is argued, on one hand, that kinship ties can be mobilized for capital accumulation, as is the case in East Asia (e.g., Perkins 2000). On other hand, the redistributive obligations within kinship networks in African and Middle Eastern countries are seen as acting as a drain on entrepreneurial resources and an obstacle for entrepreneurial dynamism (see early anthropological contributions such as Dorjahn 1962; Hunter 1962; Khalaf and Shwayri 1966).

In a large sample study of about 1670 German business founders, Brüderl and Preisendörfer (1998) conclude that social capital enhances the success of newly founded businesses. Support from strong ties, such as friends and family, enhance survival and sales growth, whereas support from weak ties has an effect only on sales growth. On the other hand, employee growth is not affected by network support at all. In addition to examining the effect of social capital on success, Brüderl and Preisendörfer test a network compensation hypothesis. They reason that social capital is used only to compensate for shortfalls in human capital, but they fail to find support for this idea. Although no effects of human capital on the amount of social capital are found, Brüderl and Preisendörfer do find very strong effects of human capital, i.e., years of schooling and work experience, on the success of new businesses.

In a study of 250 nascent entrepreneurs in North Carolina, Renzulli, Aldrich and Moody (2000) find no evidence that human capital, i.e., the level of education, predicts whether the respondents actually started a business one year later. One indicator of social capital, namely the proportion of kin in the network, does predict business start-ups. Networks with relatively many kin members constrain the likelihood that a business start-up will happen. The explanation for this effect is that kin ties are less likely than nonkin ties to provide instrumental resources and unique information. Renzulli, Aldrich and Moody find no support for their hypothesis that more heterogeneous networks are associated with an increased likelihood that a nascent entrepreneur will actually start up a business.

In a small-scale ethnographic study, Anderson and Miller (2003) conclude that entrepreneurs from higher socioeconomic groupings perform better and have higher amounts of human capital, as well as social networks characterized by higher amounts of human capital. Davidson and Honig (2003) compare a randomly selected group of 380 individuals engaged in nascent activities with a control group of 608 individuals, all living in Sweden. They find that although social capital and human capital both have a strong effect on the likelihood of starting up a business, these effects are much weaker in taking the start-up process towards successful completion.

The results of a large-scale longitudinal survey by Bosma et al. (2004) contradict the finding of Davidson and Honig that survival is only weakly influenced by human and social capital. Bosma et al. study a sample of about 900 Dutch nascent entrepreneurs during the period 1994-87. They find that human capital and social capital affect the survival, profit and employment growth of the business. However, not all indicators of human and social capital affect business performance similarly. With regard to human capital, it is industry-specific human capital in particular that affects business performance. General human capital, i.e., the level of education, impacts only on profits. Entrepreneurship human capital, i.e., experience in business ownership, significantly affects only survival, but not profits and employment growth. Regarding social capital, information gathering via business networks is a predictor of business survival, profit and employment growth. Whether or not an entrepreneur has a spouse is also regarded as social capital by Bosma et al. (2004), who find that the presence of a spouse affects business survival negatively. However, this effect is compensated if the spouse gives emotional support. Emotional support from a spouse affects profits positively as well.

Finally, in a small-scale study of technology-based academic entrepreneurs in the UK, Mosey and Wright (2007) note that social capital varies between entrepreneurs with different levels of business experience. However, they do not test for the effects of human and social capital on entrepreneurship outcomes.

The above mentioned studies all focus on entrepreneurship in the context of advanced economies. Until recently, there has been insufficient attention on the role of entrepreneurship in the very different context of developing economies. In many developing countries, there are major institutional obstacles to entrepreneurship. These include lack of adequate infrastructure, political and economic uncertainty, corruption and, until the mid-1980s an emphasis on state-led models of economic development (Szirmai 2005). Also, a great majority of entrepreneurs in the poorer developing countries are in the informal sector, where they operate micro enterprises, with a strong emphasis on survival.

In Africa there has been a resurgence of firm-level studies in the past fifteen years (e.g., Tybout 2000; Semboja and Kweka 2001; Sleuwaegen and Goedhuys 2002; van Biesebroeck 2005; Söderbom, Teal and Harding 2006), but many of these surveys focus more on formal sector enterprises and analyse the determinants of innovativeness, firm survival and growth. They disregard the small enterprises in the informal sector. The successive rounds of the GEM survey have provided valuable new information on entrepreneurship in developing countries, but these surveys are necessarily short and rudimentary and the information on human and social capital extremely limited.

Although it is recognized that both human and social capital play a pivotal role in economic development (Woolcock 1998; Woolcock and Narayan 2000), it is still uncommon to find similarly related studies on entrepreneurship in developing countries. One exception is Honig (1998) who surveys 215 Jamaican informal micro entrepreneurs. Honig finds that those entrepreneurs who had a education, also had a higher income. Also, if an entrepreneur was a church member who visited church semiweekly, then the entrepreneur had a higher income as well. Honig's findings also suggest that the effects of human capital and social capital may vary between different business environments.

2.3 Human and social capital: complements or substitutes?

The human capital explanation of entrepreneurial success is that people who do better are more able individuals. They are the better educated, better skilled, healthier and more experienced people, and these human resources help them to be more successful, effective and productive than those who possess less human capital. In this human capital view, it matters 'what you know'. Social capital explanations of success are based on the idea that people who do better are better connected to other people.

The notion that human capital and social capital are complementary forms of capital can be traced back to Coleman (1988). Coleman discusses the effect of social capital on the human capital of the next generation. He argues that social capital in the family as well as in the community promotes the formation of human capital. Without social capital there will be lower stocks of human capital. Burt (2001: 32) also considers human and social capital as complements: 'Social capital is the contextual complement to human capital'. In the perspective of Burt, human capital yields a higher profit, as it is complemented by social capital: it is 'what you know' and 'who you know'.

An opposite line of thinking is that human capital and social capital form substitutes. Piazza-Georgi (2002) argues that acquiring capital requires investments. People who invest much time in building up their human capital by getting an education will subsequently invest less time in social capital. Brüderl and Preisendörfer (1998) hypothesize that especially entrepreneurs who lack other sources of capital (human and financial) will be motivated to mobilize resources through their social network. According to Brüderl and Preisendörfer, this so-called 'network compensation hypothesis' might explain why many empirical studies do not find positive effects of social networks on business performance. Entrepreneurs who mobilize their networks are those who lack human and financial capital. Hence, effects of social capital are complemented with effects of human capital. The network hypothesis was tested empirically using a sample of 1,849 business founders, and the effects of different aspects of human capital on network support varied considerably. For instance, total years of schooling have a negative effect on the level of network support from strong ties such as family, while the same variable has a positive effect on the amount of network support from weak ties of the business founders. Based on their results, Brüderl and Preisendörfer (1998) call the evidence inconclusive.

In this paper we focus on the following topics: characteristics of small entrepreneurs in the context of a developing country and the measurement of human and social capital. We address the impact of human and social capital on different dimensions of entrepreneurial performance such as objective economic performance, gestation activities and innovative performance. Finally, we address the issue of complementarity or substitutability of human and social capital in terms of explaining entrepreneurial

success. In doing so, we distinguish between two important dimensions of social capital, namely the size of the network and the resources that one can draw from the network.

Our first working hypothesis is that the amount of social capital of a small entrepreneur is inversely related to his/her human capital (the network compensation hypothesis). Our second working hypothesis is that the effects of human capital and social capital on indicators of entrepreneurial performance are substitutable, rather than complementary.

3 Data, methods and operationalization

To study the interaction between human and social capital in a developing country, we use data from a recent survey conducted among Ugandan entrepreneurs in May 2008. Uganda is a developing country with a population of about 30 million people, some 40 per cent of whom are still living in poverty. Uganda is a very interesting country for studying entrepreneurship, since it is said to be one of the most entrepreneurial countries in the world. It has a total entrepreneurial average index (TEA) of 30 per cent of the working population (16-64). About 3.1 million people are estimated to be entrepreneurs, the males accounting for about 65 per cent of the entrepreneurs (Walter et al. 2003, 2004). However, the business failure rate is reportedly high. On average, 30 per cent of the entrepreneurs shut down their businesses within the first 12 months of operation. When business registration is used as an indicator of formalization, 66 per cent of Ugandan businesses are not registered in any way (informal enterprises) and 27 per cent do not pay any tax or any local market dues (Walter et al. 2003, 2004).

The sampling procedure employed in the survey is based on the Global Entrepreneurship Survey approach for selecting respondents. (See Walter 2003, 2004 for more details on the GEM in Uganda.) The sample area is restricted to central Uganda. There are three other regions, but their inclusion would have been too costly. In central Uganda two different districts are covered, namely Kampala, the capital city and leading commercial town of Uganda, and one rural area, namely the Mpigi district, largely a rural district, dependent mainly on subsistence agriculture.

The Uganda Bureau of Statistics provided detailed maps of numbers, location, and composition of households. A representative sample of populations aged 16-64 was attained by taking a designated sample of households and selecting one adult per household at random.

Local government officials of the respective areas were helpful in providing and updating area registries of deaths and migrations, and locating selected households. We use the Ugandan Bureau of Statistics' definition of a household 'as a group of people who normally eat together'. In case of ambiguity, only those who ate together the previous day are included in the composition of a given household. The local authorities were also helpful in making a distinction between residents who were entrepreneurs or non-entrepreneurs.

The sample was selected in a number of steps. First, parishes were selected. Next, local officials provided us with lists of households, indicating which households were entrepreneurs. From these lists some 750 entrepreneurial households and a control

group of 250 non-entrepreneurial households were selected. The selection of households and subsequently of the respondents within the households was done randomly.

If there were more than one entrepreneur within the household, the adult entrepreneurial family members were numbered according to their age, assigning number one to the oldest and the highest number to the youngest household member. The respondent was selected according to a random selection from a random numbers table: the second oldest person was selected if the chosen random number was a two, the fifth oldest if the random number was a five, etc. A similar procedure was chosen for the non-entrepreneurial households, with the difference that here every adult household member was assigned a number. In this paper we analyse only the data for 733 entrepreneurs.

Since questionnaires could not be mailed, faxed or couriered to respondents in Uganda, the data had to be gathered via personal interviews. The interviews were carried out in May 2008. A team of ten interviewers were assembled and trained. The interviewers were all either graduate students or staff at Makerere University Business School (Kampala). All but one interviewer had extensive previous experience as an interviewer working for the Global Entrepreneurship Monitor (GEM) projects in 2003 and/or 2004. During the training, sampling procedures, translations of key terms in the questionnaires and handling of respondents were emphasized. Finally, the interviewers were field-tested to assess their ability to handle the data collection before they embarked on the exercise.

3.1 Questionnaire development

We devoted a substantial amount of time and effort to the construction and testing of the questionnaire. Three extensive pre-tests were carried out to fine tune the instrument to local circumstances, and to ascertain the most appropriate way of asking the necessary questions. The questionnaire consisted of mainly closed-ended questions. Given the fact that many of the respondents had limited time for anything else apart from their own work, the questionnaires were inspired by simplicity and clarity, to exhaustively explore the variables.

3.2 Data collection

The data collection took place in the first two weeks of May 2008. In almost all cases we could trace the selected person, and the selected person was willing to participate in the study. In Kampala there were five refusals; in Mpigi, two. Hence, we reached an unusually high response percentage of about 99.3 per cent. Each interview continued until the informant had completely described all the relevant issues. On average, an interview took 45-60 minutes.

The stratified sample consisted of 999 individuals aged 16-64 years. We oversampled entrepreneurs. Furthermore, we separated the urban and rural regions. The ratio of rural and urban areas in the sample (entrepreneurs and non-entrepreneurs) was in approximately equal proportions. Of the 504 rural and 495 urban respondents, 737 respondents were entrepreneurs and 262 non-entrepreneurs, allowing for comparisons between the two groups. Four of the 737 entrepreneurs were later discarded, because they belonged to the same enterprise.

Table 1
The sample

Number of respondents	Urban	Rural	Total
Non-entrepreneurs	123	139	262
Entrepreneurs	372	365	737
Total	495	504	999

3.3 Dependent variables

Business success

Obtaining accurate data on sales and profits is a well-known problem in African research settings (Daniels 1999; Kraus 2005). In the pilot studies, it became apparent that most entrepreneurs were very reluctant to give information on sales and profits; in the case when entrepreneurs were willing to share information, it was often hard for them to give precise estimates. Questions about sales or turnover were not well understood, especially with regard to monthly or annual sales.

We asked respondents whether their sales, number of customers and profits had changed compared to the previous year and by how much in percentage terms. We took the average percentage change of the three variables as our indicator of objective business success.

Innovativeness

To measure innovativeness, we use a set of five dichotomous items that measure whether the entrepreneur had introduced or invested in new or improved products or processes (see Table 3). These items are adapted from the first South African Innovation Survey (Oerlemans et al. 2004; Rooks et al. 2005). Innovativeness of small enterprises in the Ugandan context obviously refers to activities new to the firm, rather than to the market or to the world. We use a non-parametric items response model, the Mokken model (a probabilistic version of the Guttman scale), to measure the scalability of the items. This indicates that the items constitute a strong scale (Mokken $H = 0.54$). A Mokken H between 0.4 and 0.5 is considered to be a medium-strong scale, above 0.5 is considered to be strong (Mokken and Lewis 1982; Meijer and Baneke 2004).

Table 2
Objective business success

Item	Mean	Range	Factor loading
Percentage change in customers	11.81	-80-100	0.91
Percentage change in sales	10.25	-80-100	0.91
Percentage change in profits	8.72	-90-100	0.91

Gestational activities

The third dependent variable is an indicator of successful start-up. It assesses the progression of the exploitation process in terms of the number of gestation activities undertaken (Davidsson and Honig 2003). Davidsson and Honig identify 20 gestation behaviours. However in the context of a developing country, many of these gestation

behaviours, i.e., applying for a patent, are not really applicable. We use a set of five dichotomous items that measures gestation behaviours (see bottom of Table 3). The Mokken model indicates that the items constitute a strong scale (Mokken H = 0.62).

Table 3
Mean, range and scalability coefficient Mokken H for items
measuring innovativeness and gestational activities

Item	Mean	Range	Mokken H
<u>Innovativeness</u>			
In the last 3 yrs, have you invested resources:			
- to improve your (business) premises?	0.49	0-1	0.54
- to improve your (business) machineries or tools?	0.46	0-1	0.55
In the last 3 yrs, has your business introduced products or services that were new or improved to the market?	0.42	0-1	0.60
In the last 3 yrs, have you improved your products/services?	0.46	0-1	0.47
Do you plan to change your product-mix or service-mix within the next year?	0.59	0-1	0.58
<u>Gestational activities</u>			
Have you prepared a business plan?	0.44	0-1	0.69
Is your plan written informally for internal use?	0.43	0-1	0.65
Is your plan written formally for external use?	0.06	0-1	0.71
Have you purchased any major items like equipment, facilities or property?	0.55	0-1	0.57
Have you developed projected financial statements (such as income and cash flow statements)?	0.37	0-1	0.54

Firm size and financial resources

In the absence of information on sales or turnover, as an indicator of firm size we use the number of workers employed in addition to the entrepreneur. In addition we collect data on changes in employment in the past four years, so as to get an idea of firm dynamics. Next, we also collect information on the financial resources invested in the firm.

Human capital

Human capital of entrepreneurs is determined according to three indicators. Respondents are asked to indicate their highest level of education. This variable 'years education', ranging from no schooling to a master's degree, is coded as the number of years. Two other variables measure the amount of experience an entrepreneur had gained working as an employee for a firm or as a manager before he or she decided to start his or her own business. The variable 'years experience manager' measures the years of experience that the entrepreneur had as a manager, and the variable 'years experience employee' measures the years of experience as an employee.

Social capital: the size of networks and available resources in the social network

To obtain network data we follow a standard ego-centred network approach (Burt 1984, 1997). We use three name-generators to measure different aspects of the network of entrepreneurs. Multiple name-generators are more reliable than single name-generators for measuring the size and composition of the network (Marin and Hampton 2007). In the first name-generator, we enquire about personal contacts with the following

question: 'From time to time, most people discuss important personal matters with other people. Looking back over the last six months—who are the people with whom you discussed an important personal matter?'. This provides indicators for the respondent's personal social capital. The second question was about contacts with whom business matters were discussed: 'From time to time, entrepreneurs seek advice on important business matters. Looking back over the last six months, who are the people with whom you discussed an important business matter?'. This provides indicators for the informational social capital. The third question was about business contacts that could provide material support: 'If you were seeking material support for your business from other entrepreneurs, who, in the last six months, are those entrepreneurs?'. This provides information on resource social capital. For every name-generator question, the respondent was asked to list a maximum of five names. Limiting the number of alternatives is the standard way to cope with time constraints while maintaining measurement precision and decreasing measurement bias (Burt 1984: 315). There were a number of questions on each person cited in the name-generator, referring to important issues such as the frequency of contacts with each person and a list of possible resources that might be obtained from the contact cite.

There are relatively many studies on the interaction of entrepreneurs with social networks in their local environment (Birley 1985; Larson 1992; Baum, Calabrese and Silverman 2000; Greve and Salaff 2003; Hoag and Antoncic 2003). Networks are often conceived of as channels to gain access to external resources, such as financial capital, information and advice (Birley 1985; Freeman 1999). The amount of resources that an entrepreneur has access to is related to the size of his network and the status of the entrepreneur within that network (Aldrich and Reese 1993; Hansen 1995; Powel et al. 1996). Strong ties and a broad network appear to influence the persistence and success of nascent entrepreneurs in continuing with formation activities (Butler and Hansen 1991; Davidsson and Honig 2003).

We construct two variables to measure social capital. The first variable, 'size', is the total number of unique contacts cited by entrepreneurs in the name-generator. The second variable, 'network resources', is based on the question of possible resources a respondent could obtain via the contacts he/she cited. For every type of resource, the respondent would indicate whether he/she would be able to get the resource from the named contact. This variable is the aggregate of the resources he/she could obtain from the individuals in his/her network. We use four different types of material resources: financial, tools and machinery, premises or space, and free labour.

3.4 Control variables

To control for possible conflicting effects, we include a number of control variables.

Age is considered to be a factor in the probability of establishing a business. As individuals grow older, they are less likely to invest in the activities needed to start a new enterprise.

Gender: In most countries gender is found to be a significant factor in the probability of establishing a business. To control for this, we include a dummy variable, 'gender' (female = 1).

Marital status: The presence of a spouse is argued to be an aspect of social capital, thus having a positive influence on entrepreneurship (e.g., Davidsson and Honig 2003). However, empirical results are inconclusive. Bosma et al. (2004) find that the presence of a spouse has a negative effect on the survival, no effect on profits, and a positive effect on employment growth. Donaldson and Honig (2003) find that being married has no effect on sales growth, but does impact on the level of gestational activities after two years. Honig finds that being married is associated with a higher income (no causality tested). Renzulli, Aldrich and Moody (2000) note that marital status has no effect on the likelihood of starting up a business. One possible explanation for the lack of consistent results is that marital status, in addition to facilitating the effects of social capital, also creates potential constraints on economic activities due to gender-based expectations (Renzulli, Aldrich and Moody 2000). To control for possible effects of having a spouse, we include a variable, 'married' (married = 1).

Rural versus urban region: To control for possible conflicting effects of the sample regions, we include a dummy variable, 'rural' (rural region = 1; urban region = 0).

Economic sector: We construct dummies for customer services, agriculture and manufacturing with trade and services as the baseline.

Environmental context: We include a number of variables to control for the possible effects of entrepreneurial context. The first variable measures the dynamism of the entrepreneurial environment; the second gauges the competitive intensity that an entrepreneur experiences (competition).

4 Results

4.1 In search of the Ugandan entrepreneur

The GEM data suggest that Uganda has a high level of entrepreneurship compared to many other developing countries. Its TEA index stands at 30 per cent of the adult population, pointing to the existence of some 3.1 million entrepreneurs (excluding peasant farmers who produce for their own consumption).

However, if we interpret entrepreneurs as a class of dynamic creators who contribute to the transformation of a developing economy by introducing new activities, promoting structural change, adopting innovations and promoting the general dynamism of the economy, it is doubtful whether these 3.1 million self-employed persons should be classified as entrepreneurs. A distinction needs to be made between people who are self-employed simply for reasons of survival or necessity and the Schumpeterian type of creative entrepreneurs.¹

We use our new sample of 733 Uganda enterprises to provide a description of the country's entrepreneurs and to throw further light on this issue of Schumpeterian entrepreneurship.

¹ GEM attempts to distinguish Schumpeterian entrepreneurs by asking the respondents whether they are trying to take advantage of business opportunities or because they have no better choices for work.

Predominance of tiny enterprises: The first finding worth noting is the predominance of tiny enterprises: 64 per cent of the enterprises in our sample employed only one person, and 85 per cent of the enterprises employed less than three people. There were only 25 enterprises (3.7 per cent) with ten or more employees. In most cases where the question was not answered, we assume these to refer to enterprises without any employees, bringing the percentage of enterprises with employees to 11.7 per cent.

Table 4
Number of persons employed by the Ugandan entrepreneurs

Number of persons employed	No.	Valid percentage	Percentage
None	22	3.3	3.0
1	428	64.0	58.4
2	102	15.2	13.9
3	41	6.1	5.6
4-9	51	7.6	7.0
10-15	12	1.8	1.6
More than 15	13	1.9	1.8
Total	669	100.0	
Missing data	64		8.7
Total incl. missing	733		100.0

Most enterprises very young: Most Ugandan enterprises were young; 55 per cent had started after 2004, 73 per cent after 2002, and 11.5 per cent or 81 firms had been established in 2008, the year that the survey was held.

Table 5
Year of start-up

	No.	%
2008	81	11.5
2005-07	307	43.5
2002-04	130	18.4
1999-2001	71	10.1
1998-95	51	7.2
Total	706	100.0

Cooperatives: Many of the larger firms were some kind of cooperative. For instance, a firm with 19 employees turned out to have 19 owners. Eight of the 22 firms with more than ten employees were cooperatives, with the same number of owners as the number of employed.

Use of family labour: On average, 18 per cent of the persons employed in the enterprises were family members, a figure which, on the basis of the informal sector literature, was lower than expected. Surprisingly, the percentage of family labour was the lowest in firms with only one employee (a mere 9.6 per cent). It was quite substantial in firms with two to nine employees (27.5 per cent). In this category family employment was an important factor. In enterprises with more than ten employees, 17.1 per cent of the workforce consisted of family members.

Gender: Forty-two per cent of our entrepreneurs were female, and only two of the 25 largest firms were run by women entrepreneurs. But apart from these exceptions, there was no clear relationship between size and gender. It is interesting to note that while female entrepreneurs were well represented in all sectors, they tended to be predominant in the service sector (consumer services plus business services, 52 per cent).

Registration as formal enterprise: Of the 733 sample firms, 241 indicated that they were formally registered with the authorities. As might be expected, most of the larger firms were registered. Of the 25 firms with more than ten employees, 17 were registered. But the percentage of the smallest registered enterprises was not significantly different from the average (36.3 per cent).

Entrepreneurial history: Respondents were asked whether they had experienced the shut-down of a firm where they had been the owner in the past. They were also asked whether they expected to set up another enterprise in the future. This gave us four categories: (i) entrepreneurs who had experience only with their present firm, (ii) those with a history of entrepreneurship, (iii) entrepreneurs with no history but hoping to start up another firm in the future, and (iv) entrepreneurs with both past history and future expectations. We consider the latter group to be the most dynamic one, and refer to them as serial entrepreneurs (43.5 per cent of our sample fell in this category). When we crosstabulate entrepreneurial history with firm size, we see that the larger firms tended to have significantly more serial entrepreneurs than the smaller ones (60 per cent of the firms with more than ten workers were serial entrepreneurs).

Sectoral distribution: Most enterprises, including both tiny enterprises and some of the largest, were in consumer-oriented services (restaurants, lodging, recreation). The second most important activity was trade, where the very small enterprises dominated. Manufacturing accounted for around 11 per cent of the enterprises, with the larger firms dominant (around 20 firms had more than ten employees).

Employment growth: It is hard to measure the economic performance of micro enterprises in a developing country. Respondents tended not to think in terms of economic concepts such as annual sales, turnover or profits. Even if they had an idea of their sales, they were very unwilling to provide such data to the interviewers, due to their fear of tax authorities. Therefore, one of the few measures we use for firm dynamism is employment growth. We find that not only were the firms usually minuscule, they also showed a marked lack of dynamism in terms of employment growth. Sixty-six per cent had no growth of employment whatsoever between 2005 and 2008, while 6.2 per cent indicated a decrease in employment: 10.9 per cent had been set up in 2008.

Only 15.6 per cent of the enterprises registered some growth of employment in the four-year period. In most cases, this referred to the hiring of one or two workers at the most (8.9 per cent and 2.5 per cent, respectively). There was a very small subset of dynamic enterprises exhibiting growth (less than 4 per cent of all enterprises).

Not surprisingly, there was a strong overlap between the set of larger firms and the more dynamic firms. Almost all of the larger firms experienced employment growth. In addition there was a small number of minuscule firms that had expanded their staff to five-eight persons. It is in this small subset that we should look for the dynamic Schumpeterian entrepreneurs.

Table 6
Entrepreneurial experience and future expectations

Present firms only	Present firm			Total
	+ previous experience	+ expecting a future start-up	+ previous experience and expected start-up	
103	278	33	319	733
14.1%	37.9%	4.5%	43.5%	100.0%

Table 7
Employment size broken down by sector

Employment size	Consumer oriented services	Agriculture	Manu- facturing	Extraction	Construction	Trade	Business services & other services	Total
2008								
0	11	0	0	0	0	10	1	22
1	163	55	37	3	1	116	48	423
2	40	21	6	0	1	18	14	100
3	11	11	5	1	2	3	8	41
4	3	5	3	0	0	2	4	17
5	1	2	2	1	0	2	5	13
6	2	2	3	0	2	0	1	10
7	1	1	0	0	0	0	0	2
8	2	3	1	0	0	0	1	7
9	0	2	0	0	0	0	0	2
10	1	1	4	0	0	1	1	8
12	0	0	0	0	0	0	3	3
13	0	0	0	0	0	1	0	1
16	0	0	0	0	0	0	1	1
17	0	0	0	0	0	0	1	1
18	0	0	3	0	0	0	0	3
19	0	0	0	0	1	0	0	1
20	1	0	4	0	0	0	0	5
37	0	0	2	0	0	0	0	2
40	0	0	1	0	0	0	1	2
45	1	0	0	0	0	0	0	1
100	1	0	0	0	0	0	0	1
	238	103	71	5	7	153	89	666
	35.7	15.5	10.7	0.8	1.1	23.0	13.4	

Table 8
Firm dynamism

Firm dynamics	No. of firms	%
Firms started up in 2008	81	11.1
Firms exhibiting: declining employment	46	6.3
No change	484	66.0
Growth	114	15.6
Characterized as:		
Very little (hiring 1 employee)	65	8.9
Little (hiring 2 employees)	18	2.5
Growth (hiring 3-5 employees)	20	2.7
Strong (hiring 6-9 employees)	8	1.1
Very strong (hiring >10 employees)	2	0.3
Missing data	8	1.1
Total	733	100.0

Invested funds: Another indication of the nature of entrepreneurship is the amount of funds invested. The majority of the respondents had invested funds in his/her enterprise, but the sums were rather modest, varying from a low of UGX 1,000 (€0.40) to a high of UGX 100,000,000 (€44,000) for one exceptional enterprise. The average investment was UGX 786,082 (approximately €42). Average investments were highest in consumer/oriented services (UGX 1,182,229), followed by business services. Somewhat surprisingly, average investment was the lowest in manufacturing (UGX 335,865). Though modest, these sums were higher than the very small sums mentioned in micro entrepreneurship literature.

Broken down by firm size, we see that small enterprises predictably invested less than larger enterprises: entrepreneurs with 0-2 employees invested on average UGX 550,450 (€239), those with 3-9 employees invested UGX 1,238,060 (€538), and those with over ten employees invested UGX 4,375,536 (€1,772). In sum, we can conclude that the majority of the enterprises were small, with limited access to investment and not dynamic in terms of employment growth.

4.2 The networks of Ugandan entrepreneurs

In the follow section we briefly describe the network characteristics of the entrepreneurs, which is used later to construct our measures of social capital.

The size of the network: In entrepreneurial research the size of the network is often equated with the amount of resources one can obtain from such a network. To measure the size of the entrepreneurial support, we use data from the three-name generators that respectively measure personal network, business advice network, and material support network. On average, the personal advice network consisted of 2.8 people; the business advice network 1.9 people, and the material support network of 1.1 people. Hence, the average number of contacts mentioned totalled about six.

However, the same contact could be named more than once, since we asked about different aspects of the ego-centred network. Hence it is likely that the networks show some overlap. This is related to the phenomenon of the so-called interlocking markets in developing countries. Markets are said to be interlocked if transactions in one market depend on transactions in other markets (Taslim 1988). We anticipate possible network overlap; for every contact named in two subsequent networks, the respondent was asked to indicate whether the contact had been mentioned before. If these double contacts are taken into account, the corrected average size of the total network was four. This implies that the network overlap was 33 per cent (6-4/6). Although no comparable data are available from other studies, the degree of overlap was lower than we had expected.

It is noteworthy that there was a big difference between male and female entrepreneurial networks. Networks of male entrepreneurs were substantially larger than those of their female counterparts (4.4 versus 3.3). Another noteworthy difference in network size was between rural and urban areas, with the networks of rural entrepreneurs substantially larger than those in the cities (five versus three).

Network composition: It is often said that family plays a pivotal role in many African micro enterprises. We find that the average entrepreneurial network consisted of 40 per cent family members. This figure was slightly higher in the personal network (42 per cent) and somewhat lower in the business advice (38 per cent) as well as in material

support network (37 per cent). Again, there was a big difference between the networks of male and female entrepreneurs. The share of kin was notably higher for females than for males (50 per cent versus 33 per cent). Surprisingly, there was no difference in the proportion of kin between rural and urban entrepreneurs.

With regard to gender composition, most entrepreneur networks were rather homogeneous. Male entrepreneur networks existed for 82 per cent of the men, while the corresponding figure for females was about 60 per cent. Hence, females had the benefit of opposite-gendered networks more often than males.

We asked respondents whether the ties were local (i.e., within their home village), or non-local (i.e., outside the village). It became apparent that on average 36 per cent of the ties were non-local. There was no significant difference between males and females in the locality of their ties, but the environment, whether rural or urban, did matter. Rural entrepreneurs had clearly more local networks than their urban counterparts (29 per cent versus 43 per cent).

4.3 Explaining social capital: the network compensation hypothesis

In this section, we examine the network compensation hypothesis which suggests that scarce time can either be devoted to accumulating human capital or to investing in social capital (social networks). The hypothesis suggests that there should be a significant negative correlation between indicators of human and social capital. If there is a shortage of human capital, it will be substituted for by social capital.

It is worth noting that this hypothesis should be distinguished from the question of substitutability of human and social capital, which refers to a framework in which the same 'outcome' can be realized with different combinations of 'inputs'. The network compensation hypothesis focuses on the actual empirical proportions of human and social capital.

As can be seen from Table 9, there are no significant negative correlations between human and social capital indicators. All correlations are positive, some of them significantly so. This is elaborated further in Table 10, which takes the social capital variables 'network size' and 'network resources' as the dependent variables and examines the relationships between human capital and social capital when control variables are added.

One of the most pronounced findings is the negative effect of gender. Females have significantly less social capital than males. On the other hand, being married is positively associated with social capital. Network size in rural areas is significantly higher than in urban areas. Finally, entrepreneurs in consumer services and agriculture have significantly more social capital than in other sectors.

The two regression tables confirm the initial conclusions from the bivariate correlations. There are no significant negative coefficients of the human capital variables, but there are various significant positive effects. Thus, both the years of education and the years of management experience have positive effects on network size. In sum, entrepreneurs with more human capital tended to have more developed social networks. This contradicts the network compensation hypothesis.

Table 9
Correlations between human and social capital

	Human capital indicators		
	Years of education	Years of management experience	Years of work experience
Network size	0.16	0.11**	0.03
Network resources	0.08*	0.09*	0.03

Note: * p<.05; ** p.<.01 (two tailed tests).

Table 10
Determinants of social capital

	Network size		Network resources	
Human capital				
Yrs of education	0.063	(0.025)*	0.042	(0.069)
Yrs of management experience	0.164	(0.061)**	0.407	(0.176)*
Yrs of work experience	0.003	(0.023)	-0.034	(0.063)
Control variables: individual				
Marital status (married = 1)	0.374	(0.190)*	2.148	(0.626)
Age	0.003	(0.010)	-0.033	(0.026)
Gender (female = 1)	-0.936	(0.162)***	-1.886	(0.480)***
Control variables: enterprise				
Size enterprise	-0.004	(0.030)	0.029	(0.105)
Formally registered	0.120	(0.170)	1.485	(0.504)**
Age of enterprise	0.006	(0.015)	0.020	(0.043)
No. of co-owners	0.060	(0.050)	0.149	(0.172)
Control variables: environment				
Dynamism environment	0.046	(0.074)	0.201	(0.215)
Competitive pressure	-0.015	(0.085)	0.164	(0.249)
Region	1.778	(0.203)	0.449	(0.534)
Services	0.230	(0.168)	3.316	(0.523)***
Agriculture	-0.158	(0.273)	2.458	(0.695)***
Manufacturing	0.224	(0.354)	1.174	(0.741)
Constant	3.113	(0.421)	4.218	(0.236)
No. of observations	673		673	
F	15.10*** (16, 656)		6.81*** (16, 656)	
R ²	0.234		0.137	

Note: Standard deviations in parentheses; * significant at 0.10%; ** significant at 0.05 %; *** significant at 0.001%.

4.4 Determinants of entrepreneurial performance

In this section we analyse the determinants of three aspects of entrepreneurial performance: objective business success, gestation activities and innovative performance.

We also analyse subjective business success, but have not included these results in this paper. Subjective business success tells us more about their feelings of relative deprivation of the entrepreneurs rather than about their performance. For instance,

network resources are negatively associated with subjective business success. The more resources the network members have, the less successful the entrepreneur feels.

The analysis is performed on two levels. At the first level, we simply discuss and interpret the significant determinants of entrepreneurial performance. At the second level, we focus on the central question in this paper, the complementarity or substitutability of human and social capital.

Substitutability versus complementarity: some methodological remarks: Applying the economic notion of substitutability of inputs to standard regression equations, we argue that a positive and significant coefficient for the two independent variables implies that they are substitutable. A significant regression coefficient implies a positive effect on the dependent variable, holding the other independent variable constant. Thus, by increasing one independent variable and reducing another or vice versa, the same outcome for the dependent variable can be found. Thus these two independent variables are substitutable.

With respect to the issue of substitutability, a positive and significant coefficient of the human capital variable and the social capital variable in the same equation means that they are substitutable. A positive coefficient for one variable and a nonsignificant coefficient for another means they are non-substitutable; similarly, a positive coefficient for one variable and a nonsignificant coefficient for the other also implies non-substitutability. (One can think of the well-known example of a combination of flour and water used for baking bread. Only fixed proportions of flour and water produce eatable bread. No substitution is possible.)

A positive and significant coefficient for the interaction term between human and social capital implies complementarity. A positive and significant coefficient for the interaction term and positive (and significant) coefficients for human and social capital imply complementarity, but with some substitutability at the margin. This reasoning is used to interpret the subsequent regression tables.

Endogeneity: As in our statistical model, we use the ordinary least square model in the equations explaining entrepreneurial performance. One objection to using this model in our case is that social capital may be conceived as an endogenous variable (see our explanation of social capital) because the amount of one's social capital depends, among others factors, on human capital. Our previous analyses show that although there are some significant relationships, we can explain only 10-20 per cent of the variance in social capital. Nevertheless, endogeneity may pose serious statistical problems.

To first investigate endogeneity we execute a so-called augmented regression test. We first perform a regression on social capital, and include the residuals of this regression in a regression on our performance indicators. This test indicates endogeneity. To test whether this endogeneity has deleterious effects, we perform a Hausman-test using instrumental variables. As our instruments we use a number of variables that do not correlate with the error term of our dependent variables, but do correlate with social capital (the proportion of gender, kin and locality of ties within the network, and marital status). The Hausman-test indicates that in most cases endogeneity is not a problem. The only problematic result is that the least squared coefficient of network resources in the regression of gestation activities is likely to be inconsistent. However, in our instrumental variables regression analysis of gestation activities, we see that the

coefficient of network resources is higher than the least squares estimate. At this stage we decide to use our original social capital variables in the following analysis. The statistical problems due to endogeneity are only minor, and using an instrumental variable approach to correct the problem is in itself often associated with major estimation problems (see, for instance, Bound, Jaeger and Baker 1995).

Objective success: Table 11 presents four specifications with objective success as the dependent variable. The first specification includes all relevant background variables. In the second specification, we add interaction terms for the different human and social

Table 11
Determinants of objective success

	Model 1	Model 2	Model 3	Model 4
Human capital				
Yrs of education	0.011 (0.011)	0.009 0.012	0.023 (0.012)*	0.024 (0.011)*
Yrs of management experience	0.045 (0.042)	0.014 (0.056)	0.052 (0.035)	
Yrs of work experience	-0.006 (.011)	-0.002 (0.013)	-0.006 (0.011)	
Social capital				
Network size	-0.018 (0.024)	-0.024 (0.025)	-0.008 (0.023)	
Network resources	0.010 (0.010)	0.012 (0.009)	-0.018 (0.013)	-0.011 (0.009)
Control variables: individual				
Marital status (married = 1)	0.014 (0.107)	0.005 (0.107)		
Age	-0.012 (0.005)**	-0.011 (0.005)*	-0.014 (0.004)***	-0.013 (0.004)***
Gender (female = 1)	-0.058 (0.083)	-0.058 (0.083)		
Control variables: enterprise				
Size enterprise	0.020 (0.006)**	0.020 (0.006)**	0.015 (0.005)**	0.014 (0.005)**
Formally registered	-0.076 (0.084)	-0.076 (0.084)		
Age of enterprise	-0.003 (0.008)	-0.004 (0.008)		
No. of co-owners	-0.014 (0.016)	-0.014 (0.016)		
Control variables: environment				
Dynamism environment	0.119 (0.042)**	0.120 (0.042)**	0.127 (0.040)**	0.136 (0.038)***
Competitive pressure	-0.059 (0.039)	-0.061 (0.040)		
Region	-0.097 (0.096)	-0.082 (0.097)		
Customer oriented	-0.050 (0.092)	-0.040 (0.093)		
Agricultural	0.221 (0.120)	0.191 (0.123)	0.300 (0.096)***	0.315 (0.095)***
Manufacturing	-0.012 (0.151)	-0.019 (0.151)		

Table 11 cont'd

Table 11 (cont'd)
Determinants of objective success

	Model 1	Model 2	Model 3	Model 4
Social capital * human capital				
Netw. res. * y. o. educ.		-0.002 (0.003)		
Netw. size * y. o. educ.		-0.001 (0.010)		
Netw. res. * y. man. exp.		0.000 (0.010)		
Netw. size. * y. man. exp		0.025 (0.020)		
Netw. res. * y. wo. exp.		0.006 (0.003)		
Netw. size * y. wo. exp.		-0.005 (0.006)		
Non-linear effects				
Years of education ²			0.004 (0.002)*	0.004 (0.002)*
Network size ²			-0.013 (0.006)*	
Network resources ²			0.002 (0.001)**	0.001 (0.001)*
Network resources * region			0.022 (0.014)	
Constant	0.704 (0.199)	0.704 (0.199)	0.251 (0.122)*	0.257 (0.118)*
No. of observations	672	672	695	698
F	3.42***	2.72*** (24, 647)	5.21*** (13, 681)	7.39*** (6, 691)
R ²	0.063	0.075	0.079	0.067

Note: Standard deviations in parentheses; * significant at 0.10%; ** significant at 0.05 %; *** significant at 0.001%.

capital indicators. In the third column, we add other non-linear terms and find that the square of human capital and the square of network resources are significant. In column 4, we drop the nonsignificant control variables and all nonsignificant non-linear terms. This column is our preferred specification. A similar procedure is followed in the subsequent sections.

We find positive effects of years of education, firm size and the agricultural sector dummy, while being married has negative effects. The perceived dynamism of the environment also has a positive and significant coefficient.

In general, the degree of explained variation is very limited. Many of the coefficients are nonsignificant. With regard to substitutability, the results are somewhat mixed. The sign of education is positive, while the sign of network resources is negative and nonsignificant. This is an indication of non-substitutability. However, the sign of network resources squared is positive, indicating that there is some degree of substitutability of human capital and network resources at higher ranges of the variable network resources. None of the interaction terms is significant, which indicates an absence of complementarity effects.

In interpreting these results, one should keep in mind the shortcomings of our performance indicator: perceived changes relative to the previous year. The time span is too short to accurately distinguish better or weaker performing enterprises.²

Gestation activities: Much more interesting results are noted for the dependent variable gestation activities (presented in Table 12). The dependent variable is the scale created by summing the answers to the five dichotomous questions on gestation activities, which are a good indication of entrepreneurial dynamism. Our preferred specification is specification 4.

The results for gestational activities are interesting. We have a high level of explained variance ($R^2 = 0.47$), and significant influences of human capital, network resources, interaction terms and squared variables. The first interesting finding is the difference between the effects of network size and network resources. Network resources have a positive effect on gestation activities, while network size has no significant effect. The second finding is that the square of network resources has a negative sign, indicating

Table 12
Determinants of gestation activities

	Model 1	Model 2	Model 3	Model 4
Human capital				
Yrs of education	0.037 (0.013)**	0.037 (0.013)**	0.033 (0.014)*	0.034 (0.012)**
Yrs of management experience	0.052 (0.030)	0.113 (0.038)**	0.040 (0.029)	
Yrs of work experience	-0.002 (0.015)	-0.005 (0.014)	-0.004 (0.014)	
Social capital				
Network size	0.001 (0.033)	0.010 (0.032)	0.042 (0.033)	0.033 (0.031)
Network resources	0.080 (0.011)***	0.076 (0.011)***	0.123 (0.016)***	0.126 (0.014)***
Control variables: individual				
Marital status (married = 1)	0.362 (0.124)**	0.386 (0.124)**	0.267 (0.110)*	0.299 (0.109)*
Age	-0.002 (0.006)	-0.003 (0.006)		
Gender (female = 1)	-0.314 (0.100)**	-0.306 (0.099)**	-0.213 (0.096)*	-0.215 (0.095)*
Control variables: enterprise				
Size enterprise	-0.010 (0.011)	-0.0009 (0.010)		
Formally registered	0.411 (0.111)***	0.414 (0.112)***	0.394 (0.107)***	0.396 (0.107)***
Age of enterprise	-0.005 (0.008)	-0.003 (0.009)		
No. of co-owners	-0.005 (0.020)	-0.007 (0.021)		

Table 12 cont'd

² Output indicators are notoriously difficult to collect in this type of research. Most studies use employment growth as a proxy indicator. We also experiment with employment growth as a dependent variable, but there is insufficient variation for any meaningful results.

Table 12 (cont'd)
Determinants of gestation activities

	Model 1	Model 2	Model 3	Model 4
Control variables: environment				
Dynamism environment	0.537 (0.052)***	0.536 (0.052)***	0.504 (0.051)***	0.507 (0.050)***
Competitive pressure	.064 (0.052)	0.058 (0.051)		
Region (rural = 1)	1.633 (0.134)	1.623 (0.133)	1.489 (0.115)***	1.500 (0.115)***
Customer oriented	.384 (0.121)**	.358 (0.121)**	0.249 (0.111)*	0.239 (0.111)*
Agricultural	0.091 (0.178)	.143 (0.178)		
Manufacturing	0.177 (0.187)	0.171 (0.185)		
Social capital * human capital				
Netw. res. * y. o. educ.		0.008 (0.003)**	.	0.004 (0.002)**
Netw. size * y. o. educ.		-0.007 (0.007)		
Netw. res. * y. man. exp.		-0.003 (0.009)		
Netw. Size. * y. man. exp		-0.019 (0.019)		
Netw. res. * y. wo. exp.		-0.004 (0.003)		
Netw. size * y. wo. exp.		0.000 (0.008)		
Non-linear effects				
Years of education ²			0.002 (0.002)	
Network size ²			-0.010 (0.008)	
Network resources ²			-0.002 (0.001)**	-0.002 (0.001)**
Network resources * region			-0.060 (0.019)**	-0.068 (0.015)***
Constant	0.625 (0.267)***	0.625 (0.267)***	1.026 (0.113)***	0.995 (0.109)***
No. of observations	673	673	703	703
F	40.54 (18, 654)	33.44 (24, 648)	59.11 (15, 687)	73.98 (12, 690)
R ²	0.457	0.467	0.471	0.472

Note: Standard deviations in parentheses; * significant at 0.10%; ** significant at 0.05 %; *** significant at 0.001%.

that the effects on gestation are non-linear, with positive effects dominating up to an optimum and negative effects setting in thereafter. The standardized beta of the non-quadratic term is much higher than that of the quadratic term. The direct positive influence of network resources is by far the most important effect.

There are positive effects of education. Formally registered enterprises are much more likely to engage in gestation activities than non-registered enterprises. It is somewhat surprising that rural entrepreneurs are more likely to consider gestation activities than

urban entrepreneurs. Perceived competitive pressure also has a positive effect. Female entrepreneurs are significantly less prone to engage in gestation activities than males.

In terms of our analysis of substitution and complementarity, one needs to distinguish between network size and network resources. Education has a significant positive effect. Network size has no significant effect. In our methodological introduction, we interpret this as a lack of substitutability. In the case of network resources, the interaction term with education is positive and significant, indicating complementarity. But the positive coefficients of both the education and the network resources variables indicate that there is substitutability at the margin.

Innovative performance: In Table 13, the dependent variable is the scale of innovative performance, constructed by summing the positive responses to the five questions on innovative behaviour (see Table 3). Our preferred specification is model 4, which explains 36 per cent of the variation of the dependent variable.

Human capital has a positive effect on innovative performance. (Human capital is significant in all of our selected specifications.) Highly educated entrepreneurs are more innovative than those with more limited education.

The effects of social capital are very interesting. Network size has a significant negative effect on innovation. Being embedded in a large network can be an obstacle for innovative entrepreneurial behaviour. In contrast, network resources have an extremely

Table 13
Determinants of innovative performance

	Model 1	Model 2	Model 3	Model 4
Human capital				
Yrs of education	0.077 (0.017)***	0.076 (0.018)***	0.074 (0.017)***	0.068 (0.016)***
Yrs of management experience	0.003 (0.041)	0.130 (0.044)**	0.008 (0.051)	
Yrs of work experience	-0.008 (0.018)	-0.004 (0.018)	0.011 (0.017)	
Social capital				
Network size	-0.134 (0.041)**	-0.134 (0.041)**	-0.062 (0.038)	-0.080 (0.036)*
Network resources	0.137 (0.012)***	0.136 (0.012)***	0.170 (0.019)***	0.181 (0.010)***
Control variables: individual				
Marital status (married = 1)	0.231 (0.166)	0.240 (0.167)	.	
Age	0.006 (0.007)	0.005 (0.007)		
Gender (female = 1)	-0.266 (0.129)*	-0.296 (0.131)*		
Control variables: enterprise				
Size enterprise	-0.002 (0.020)	-0.002 (0.018)		
Formally registered	0.215 (0.142)	0.184 (0.142)		
Age of enterprise	0.010 (0.012)	0.012 (0.012)		
No. of co-owners	0.023 (0.023)	0.026 (0.021)		

Table 13 cont'd

Table 13 (cont'd)
Determinants of innovative performance

	Model 1	Model 2	Model 3	Model 4
Control variables: environment				
Dynamism environment	0.453 (0.061)***	0.447 (0.061)***	0.445 (0.061)***	0.441 (0.057)***
Competitive pressure	-0.069 (0.070)	-0.070 (0.071)		
Region (rural = 1)	1.402 (0.171)***	1.369 (0.168)***	1.269 (0.148)***	1.227 (0.147)***
Customer oriented	0.302 (0.157)	0.281 (0.156)		
Agricultural	-0.400 (0.202)*	-0.362 (0.204)*	-0.431 (0.176)*	-0.415 (0.168)*
Manufacturing	0.222 (0.235)	0.229 (0.230)		
Social capital * human capital				
Netw. res. * y. o. educ.		0.003 (0.003)		
Netw. size * y. o. educ.		-0.015 (0.010)		
Netw. res. * y. man. exp.		-0.017 (0.008)*		
Netw. size. * y. man. exp		-0.014 (0.018)		
Netw. res. * y. wo. Exp.		0.000 (0.000)		
Netw. size * y. wo. exp.		-0.145 (0.009)		
Non-linear effects				
Years of education ²			0.003 (0.003)	
Network size ²			-0.014 (0.009)	
Network resources ²			0.001 (0.001)	
Network resources * region			-0.106 (0.022)***	-0.121 (0.018)***
Constant	1.587 (0.336)***	1.675 (0.337)***	1.821 (0.115)***	1.840 (0.087)***
No. of observations	671	671	708	708
F	30.45 (18, 652)	26.67 (24, 646)	33.26 (12, 698)	86.52 (7, 700)
R ²	0.356	0.357	0.365	0.361

Note: Standard deviations in parentheses; * significant at 0.10%; ** significant at 0.05 %; *** significant at 0.001%.

significant positive effect. It is not the size of the network that matters, but the amount of resources that can be mobilized within the network.

Again, rural entrepreneurs are significantly more innovative than those in the cities. This is somewhat counterintuitive, as one would expect most innovation to take place in urban environments. Agricultural entrepreneurs are less innovative than entrepreneurs in other economic sectors.

There is an interesting negative interaction effect between network resources and regions. Network resources have a positive impact on innovative behaviour in general, but less so in rural areas than in urban areas. Finally the perceived dynamism of the environment has a positive effect on innovative behaviour.

With regard to the substitutability or complementarity of human and social capital, all interaction terms are nonsignificant in the preferred model. They are dropped from the equation. Thus, we find no complementarity effects. There are indications of substitutability between the years of education and network resources. Holding education constant, network resources increase innovative behaviour and vice versa. This implies that the same level of innovative performance can be achieved with different combinations of human and social (resource) capital.

No such substitutability is found for network size. Holding education constant, an increase in network size can even reduce innovative performance. Controlling for network resources, network size acts as negative social capital.

Conclusions and discussion

This paper discusses the interplay of human and social capital in small firms in Uganda. It is based on a new representative survey amongst entrepreneurs, executed by the authors in May 2008.

We find that the enterprises are predominantly very small and not very dynamic. Most enterprises are young: 81 of the 733 entrepreneurs in the sample had started their enterprise in 2008, and over half the enterprises (55 per cent) had been set up in the last three years. In most cases, there was little or no growth of employment since start-up in the four years between 2005 and 2008. Where employment growth does take place, it is usually restricted to the addition of one or two employees. The amounts of funds invested in the enterprises are modest, but not negligible, averaging UGX 780,000 (approximately €340). Although it is difficult to define dynamic entrepreneurs, we suggest that only a very small subset of our 733 entrepreneurs could be qualified as dynamic Schumpeterian entrepreneurs. In terms of size, employment growth and invested funds, only some 25-40 firms are in this category. The issue of Schumpeterian entrepreneurship needs to be explored further in a subsequent analysis of our data, for instance, by using discriminant analysis.

Our data contradict the network compensation hypothesis, which suggests that entrepreneurial individuals have a choice between investing scarce time, energy and resources in the accumulation of human capital or in building social capital. The hypothesis suggests negative correlations between indicators of human and social capital. We find that there are significant positive correlations, though not very high ones. Higher human capital tends to be associated with more social capital.

The answer to the question of the substitutability or complementarity of human and social capital influencing entrepreneurial behaviour depends on the dependent variable. In the analysis of objective success, we find neither complementarity nor substitutability for the first-order terms. The interaction terms are nonsignificant and there is no evidence of a direct significant influence of social capital on performance. The

examination of the squared non-linear terms points to some degree of substitutability between years of education and network resources for higher levels of education.

In the case of gestation activities, there are no significant effects of network size, so that there can be no question of substitutability or complementarity with human capital. But the interaction term between years of education and network resources is positive and significant, pointing to complementarity between human and social capital. Also, the first-order coefficients of years of education and network resources are positive, pointing to substitutability at the margin.

The most interesting results are found for innovative performance. Here there are significant positive effects of both years of education and network resources and a significant negative effect of network size. The negative effect of network size on innovativeness indicates that there can be no substitutability with human capital. But in the case of network resources, there is clear substitutability. A given degree of innovativeness can be achieved with either more human capital or more network resources.

Summarizing, we find hardly any effects for objective success, complementarity with substitution at the margin for gestation activities and substitution for innovative performance.

An important general insight emerging from our analysis is the need to distinguish between network size and access to network resources. Controlling for access to network resources, network size is either nonsignificant or significantly negative in influencing various dimensions of entrepreneurial performance. In the case of innovative behaviour, the size of a network is even an obstacle to entrepreneurial dynamism, and can be perceived as a kind of negative social capital. This finding is consistent with the older literature on entrepreneurship in developing countries, where extended family networks in Africa and the Middle East are seen as a major obstacle to entrepreneurial success. It is an important observation for modern quantitative network research.

Some other general findings are worth summarizing. Years of education have an important positive effect on all three dimensions of entrepreneurial behaviour. There are persistent negative effects of gender. Females have significantly smaller networks than males and have significantly less access to resources. Female entrepreneurs engage in less gestation activities and exhibit less innovative behaviour.

There are also systematic effects of the urban-rural divide. Rural entrepreneurs have significantly more access to network resources than their urban counterparts. They engage more in gestation activities and show more innovative behaviour than urban entrepreneurs. This contradicts common sense expectation that more dynamism will be found in urban areas.

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Appendix

Appendix Table 1
Descriptive statistics

	Observations	Mean	Std deviation	Range
Dependent variables				
Objective success	728	0.011	0.998	-3.01, 3.02
Innovative performance	729	2.386	1.883	0, 5
Gestation activities	729	1.834	1.645	0, 5
Human capital				
Yrs of education	713	8.827	3.693	0, 20
Yrs of management experience	731	0.213	1.174	0, 15
Yrs of work experience	731	2.005	3.521	0, 32
Social capital				
Network size	731	3.944	2.290	0, 14
Network resources	731	6.187	6.281	0, 39
Control variables: individual				
Marital status (married = 1)	731	0.207	0.405	0, 1
Age	720	31.524	10.789	16, 64
Gender (female = 1)	732	0.421	0.494	0, 1
Control variables: enterprise				
Size enterprise	733	2.146	5.249	0, 100
Formally registered	727	0.366	0.482	0, 1
Age of enterprise	718	6.353	6.565	.5, 47
No. of co-owners	731	0.565	2.627	0, 40
Control variables: environment				
Dynamism environment	733	-0.003	1.006	-2.32, 2.12
Competitive pressure	730	3.830	0.949	1, 5
Region	730	0.493	9.500	0, 1
Customer oriented	733	0.363	9.481	0, 1
Agricultural	733	0.143	9.351	0, 1
Manufacturing	733	0.112	0.315	0, 1

Appendix Table 2
Correlation table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Performance																				
2. Innovativeness	0.12 ^b																			
3. Gestation activities	0.05	0.59 ^c																		
4. Yrs of education	0.10 ^a	0.22 ^c	0.20 ^c																	
5. Yrs of man. exp.	0.07	0.08 ^a	0.11 ^b	0.10 ^a																
6. Yrs of work exp.	-0.02	0.01	0.00	-0.03	0.27 ^a															
7. Network size	-0.02	0.28 ^c	0.38 ^c	0.16	0.11 ^b	0.03														
8. Network resources	0.04	0.44 ^c	0.40 ^c	0.08 ^a	0.09 ^a	0.03	0.59 ^c													
9. Marital status	-0.01	0.05	0.04	-0.04	0.07	0.08	0.01	0.11 ^b												
10. Age	-0.14 ^c	0.01	0.01	-0.19 ^c	0.08 ^a	0.26 ^c	0.03	-0.02	0.28 ^c											
11. Gender	-0.05	-0.10 ^b	-0.14 ^c	-0.11 ^b	-0.05	-0.09 ^a	-0.22	-0.14 ^c	0.04	0.10 ^a										
12. Size enterprise	0.06	0.10 ^b	0.06	0.07	0.03	0.06	0.10 ^b	0.10 ^b	0.02	0.05	-0.13 ^c									
13. Formal. register.	0.01	0.19 ^c	0.22 ^c	0.17 ^a	0.01	0.01	0.01	0.19 ^c	0.09 ^a	-0.04	-0.04	0.12 ^b								
14. Age of enterprise	-0.07	0.05	0.02	-0.11 ^b	0.01	0.14 ^c	0.04	0.03	0.15 ^c	0.55 ^c	-0.06	0.23 ^c	0.07 ^a							
15. No. of co-owners	0.00	0.07	0.04	0.05	-0.01	0.04	0.10 ^b	0.08 ^a	-0.05	-0.06	-0.07	0.46 ^c	0.09 ^a	0.18 ^c						
16. Dynamism env.	0.12 ^c	0.20 ^c	0.23 ^c	0.11 ^b	0.08 ^a	0.04	-0.08 ^a	0.08 ^a	-0.04	-0.03	0.03	0.00	0.22 ^c	0.08 ^a	-0.02					
17. Comp. pressure	-0.06	0.00	0.04	-0.02	-0.07 ^a	-0.04	-0.01	0.03	-0.07 ^a	0.00	-0.02	0.06	0.11 ^b	0.06	0.06	0.03				
18. Region (rural = 1)	-0.05	0.19 ^c	0.35 ^c	0.08 ^a	0.03	-0.07 ^a	0.38 ^c	0.01	-0.14	0.10 ^b	-0.06	0.08	-0.16 ^c	-0.01	0.07 ^a	-0.31 ^c	0.01			
19. Customer oriented	-0.01	0.14 ^c	0.10 ^a	-0.01	0.00	0.04	-0.09 ^a	0.20 ^c	-0.01	-0.05	0.16 ^c	-0.04	0.27 ^c	-0.06	-0.08 ^a	0.20 ^c	0.00	-0.30 ^c		
20. Agricultural	0.05	0.01	0.11 ^b	-0.01	0.07	0.00	0.11 ^b	0.04	0.04	0.21 ^c	-0.08 ^a	0.00	-0.18 ^c	0.06	-0.06	-0.16	-0.13 ^c	-0.39 ^c	-0.31 ^c	
21. Manufacturing	-0.02	0.08 ^a	0.12 ^b	0.00	-0.04	-0.07	0.14 ^c	0.01	-0.09 ^a	-0.09 ^a	-0.07	0.15	-0.05	0.01	0.12 ^b	-0.08 ^a	0.16 ^c	-0.32 ^c	-0.27 ^c	-0.15 ^c

Notes: a) p<.05;
b) p <.01;
c) p<.001 (two-tailed tests).