

Social Capital and the Willingness to Become Self-Employed: Is There a Difference between Women and Men?

Introduction

The purpose of this article is to explain differences in the willingness to become self-employed by using social capital as a main explanatory variable. We particularly focus on the differences in the willingness to become self-employed between highly educated males and females, since low entrepreneurship rates among the latter are particularly puzzling. Many studies provide convincing evidence that, in general, highly educated individuals start more successful businesses. Survival rates are higher, growth is faster, and innovation is more widespread (Davidsson and Honig 2003; Lussier and Pfeifer 2001; Nerlinger 1998; Brüderl, Preisendörfer and Ziegler 1996; Bates 1990; Moog 2004). However, a large number of highly educated individuals, among whom females are heavily overrepresented (Granato and Leicht 1996), never even consider starting their own business but instead restrict their occupational choice to being an employee. We argue that level and variance of social capital help to solve this puzzle and that gender differences are particularly telling.

The impact of social capital on the willingness to consider self-employment as an occupational option has not yet been studied, although it would seem to be an obvious

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explanation since it has been shown that social capital is of crucial importance for the early success of start-ups (see e.g. Oliver and Liebeskind 1997). On the other hand, it has been shown that the nature of social capital differs between men and women (Johannison and Mønsted 1997), so it could help to explain the overrepresentation of females among highly qualified individuals who never consider self-employment in their occupational choice. Social capital in this article is used rather quantitatively following the concept of Glaeser, Laibson and Sacerdote (2001). We count the number of contacts a person maintains and classify these contacts into three types according to the source of the contact, i.e. family and friends, university and business. Moreover we are able to distinguish whether the contact a person holds includes contacts to self-employed friends or family members. Both differentiations can be assumed to be important for the willingness to become self-employed, so we regard this as a strength of our data set. However, due to data restrictions, we are not able to qualify the contacts. In particular we are not able to distinguish between strong and weak ties nor can we determine whether these contacts can be characterized by trust or reciprocity, although such specifications might be helpful in explaining further gender specific differences.¹ In this respect our analysis is only a first step toward finding out whether social capital is important at all, and thus certainly leaves room for future, more detailed analyses.

The article is organized as follows. In section 2 we review the existing literature. In section 3 we analyze theoretically how social capital may affect one's willingness to become self-employed and derive empirically testable hypotheses. In section 4 we introduce our data set, specify our estimation models, an ordered probit regression and an ordered probit exogenous switching regression model, and present our empirical results. Finally, in section 5 we summarize and draw provisional conclusions for entrepreneurship theory and practice.

Literature

Although, gender differences are well known and well researched with respect to workforce participation in general, they are less well analyzed with respect to entrepreneurship, despite some rather obvious differences which we study in more depth in this article. In Germany for example, the rate of men and women studying at a university is very similar to that of men and women in the workforce (47 percent of female students compared to 53 percent male students and 45 percent female workers compared to 55 percent male workers (DeStatis 2003 and 2004). However, only a little over a quarter (28.3 percent) of all self-employed individuals in Germany are female (Holz 2004; OECD 2000, iwd 2004). The rate of female entrepreneurs in Germany is very low in comparison to that in other industrialized countries, but the women's rate is generally lower than that of men in all industrialized countries. In the OECD Employment Outlook, the unweighted average of the share of women in self-employment is 29.2 percent, with a minimum of 6.8 percent in Turkey and a maximum of 37 percent in the USA; below average rates are observed in Greece (19.4%), or in Ireland (20.1%), and above average rates in the Netherlands (32.8%) and Japan (33.9%) (OECD 2000:161). The proportion of women with a preference for becoming self-employed is even lower, with an average rate of 15 percent in OECD countries (OECD 2000:172) and 15.9 percent in Germany according to Welter and Lagemann (2003:31). Several multivariate analyses confirm that, despite controlling for a number of observable characteristics, women are still less likely to become entrepreneurs than men (see for example Blanchflower (2004) and Blanchflower and Oswald (1998).

On the other hand very few studies discuss the factors determining a low willingness to become self-employed in general, and among women in particular. Meyer-Krahmer and Ronning (2004) or Gaebe, Binder and Sautter (2004), Franke and Lütthje (2002), and Görisch et al 2002) have analyzed the effect of university, regional environment and geographical embeddedness on the willingness to become self-employed. Age and length of academic education have on average a positive effect on the willingness to become self-employed. In

Germany two factors, namely field of study (Szyperski and Nathusius 1977, Volmerig 1998; Albach 1999, Brockhoff and Tscheulin 2001) and human capital (Kriegesmann 2000, Demirer 2002), appear to exert a strong positive influence on becoming an entrepreneur. Williams (2004) shows that marriage and number of children – i.e. aspects related to family - have a strong influence on the decision of men and women to become entrepreneurs. However, they do not consider gender differences in the entrepreneurship decision.

With respect to female specific start-up success DuRietz and Henrekson (2000), Jungbauer-Gans (1993 and 1994), Brush (1997), Johnson and Storey (1993) or Hisrich and Brush (1987) show that even when controlling for many personal characteristics such as human and financial capital, industries or age there are still gender-specific differences in start-up firm performance. They show that female-owned start-ups generate less revenue and profit, grow more slowly, and are more susceptible to discontinuance than their male-owned counterparts.² In contrast, Watson (2003) reports that failure rates or success in female-owned businesses do not differ significantly from those of male-owned businesses.

With respect to the probability of being self-employed Hisrich and Brush (1984, 1987) or Brush and Hisrich (1999) reveal significant gender differences and point to differences in the business environment of men and women (see also Welter 2002), various personal characteristics (Lituchi 2004), and financial and human capital endowments (Strohmeyer 2003) as explanations. Wagner (2004) finds a lower rate of female than male nascent entrepreneurs in the Regional Entrepreneurship Monitor (REM) in Germany and explains it by differences in risk aversion³. With regard to the willingness to become self-employed, Isfan and Moog (2004), Görisch et al. (2002) and Pinkwart et al. (2001) find a significant gender effect in their empirical results. Demirer (2003) also finds a large gender effect in the willingness to become self-employed and explains it by using prospect theory. Boden and Nucci (2000) and Cromie and Birley (1991) find significant differences in the endowment of men and women with respect to start up capital. They include both human capital, like

experience in management, marketing, advertising, accounting (see also Carter et al. 2001; Brush 1992), and financial capital operationalized by the chosen industry (see also Rosa et al. 1996). However, none of the papers considers social capital as an explanation for gender-specific differences in the willingness to become self-employed.

In this article we argue that many of the observed gender-specific differences can be explained by differences in social capital; since many studies on the success of start-ups have shown that social capital appears to be crucial for early start-up success, it should also help to explain differences in the willingness to start a business. Anderson and Miller (2003), Weisz and Vassolo (2002), or Stuart et al. (1999), for example, find that the social capital of a single entrepreneur or of a team of entrepreneurs has considerable bearing on the success and development of new ventures. Furthermore, Brush and Hisrich (1999) or Aculai et al. (2004) show that the stock of social capital differs between men and women, that they have different access to resources because of this unequal stock of social capital and that differences in social capital go along with differences in the success of start-ups. Therefore, it seems obvious to us to assume that, for rational individuals, their social capital is also an important factor in their willingness to become self-employed. Laux-Ulrich and Leicht (2002) or Aculai et al. (2004) have already presented preliminary evidence indicating that differences in the social capital endowment of women and men might have an impact on their willingness to become self-employed, but they do not accord much attention to this result.

Making use of these preliminary results but paying more attention to gender specific differences in willingness to become self-employed, we study the role of social capital in such willingness. We will first analyze theoretically and empirically whether and how levels and different kinds of social capital influence the willingness to become self-employed, and second, to what extent the differing social capital investment patterns of men and women help to explain gender specific differences in this willingness.

Social capital and the willingness to become self-employed: theoretical considerations

Since previous studies have shown that social capital is important for early start-up success, we assume that social capital is an important determinant in the decision of rational individuals to become self-employed.⁴ Thus, in this article we define social capital on an individual level, following the ideas of Bourdieu (1985) and Coleman (1988). An individual can create social capital as a private good (Nielsen 2003), e.g. by extending and improving social and business relationships (Glaeser, Laibson and Sacerdote 2001) or by participating in social relations (Nielsen 2003). We can gauge social capital as a private good by measuring the size of the personal network (Nielsen 2003).⁵ In so doing, we only count personal relations that are considered to be of help on the job market. Social capital in this sense is the number of contacts a person has stemming from different sources, and is therefore an individual characteristic. The stock of social capital is defined as an important economic asset (Maskell 2000) and is expected to bring about individual returns on investment. Thus, we adopt the perception of social capital developed by Glaeser, Laibson and Sacerdote (2001) and more or less ignore the ideas originally proposed by, e.g., Putnam (2000) or Granovetter (1973) to the effect that social capital is a network of weak and strong ties; this is also partly due to data restrictions in our empirical study.

It can be assumed that social capital in this sense raises the return on investment in self-employment. In general, social capital refers to opportunities arising from the knowledge of others, namely those within a social network (Burt 1996). In particular, social capital firstly improves both the opportunity identification process and recognition capabilities, and secondly, provides access to a “loci of resources”. Thirdly, it fosters timing advantages, and last but not least, it constitutes a source of status and referrals (Nicolaou and Birley 2003). Thus, social capital is thought to reduce the amount of time and money spent on gathering information, where time and money are seen as one of the most crucial factors in the success of young start-ups. Or as Nahapiet and Ghoshal put it: “Who you know affects what you

know” (1998:252). Social capital provides individuals with a greater ability to attain and even enhance their competitive advantage by fostering new ideas (Florin, Lubatkin and Schulze 2003). The richer an individual’s social capital, the more knowledge from the social network he or she will be able to incorporate and evaluate in entrepreneurial decisions (Cohen and Levinthal 1990). Participation and investment in personal networks or contacts is therefore assumed to produce positive returns. Thus, our main theoretical argument is that the type and quantity of a person’s investment in social capital should have an impact on their occupational choice since it affects the return on investment differently in different occupational options, namely employment vs. self-employment, and thereby on their (un-) willingness to become self-employed.

The rationale for our theoretical explanation is similar to what is known from human capital theory (Becker 1962, 1964, or more recently Heckman/Locher/Todd 2003:1). Just as human capital theory assumes that an employee develops higher productivity based on his or her investment in human capital, so also do we assume a similar effect for a potential founder of a company (or a self-employed individual) based on his or her social capital.⁶ Human capital investments are linked to opportunity costs, because the individual invests time and money and is faced with foregone income. The same is true for social capital, where individuals invest time and money in building up personal or professional contacts, relationships and networks. Furthermore, like human capital, social capital is inseparably linked with the individual and is an intangible asset (Fitzenberger/Prey 1998; Hübler 1998). Accordingly, an individual invests in social capital because he or she expects higher income or success to result. An individual’s productive labor capacity gains momentum through these investments in social capital. As other studies show, we can observe differences in entrepreneurial success due to differences in the stock of social capital (see e.g., Melander and Nordquist 2001). Because individuals know about this effect and expect higher income and success due to investments in social capital in an entrepreneurial activity, they will make a

different occupational choice on the basis of their social capital. Thus, in analogy to human capital theory, our main hypothesis is that the broader and more extensive a person's social capital is, the higher is their willingness to start their own business. But the question still remains why the investments in social capital differ for men and women in the first place.

Insert figure 1 here

If investment in social capital is assumed to be rational, then men and women should only invest differently either if they expect different returns or if they are faced with a different cost function associated with investing in social capital. Timmermann et al. (2004) and Schröder, Schiel and Aust (2004) present first empirical evidence that there might be systematic differences in male and female cost functions due to family building and motherhood when investing in human capital. We argue that the same applies for investments in social capital. Such differences in the cost function result in differences in the investment strategy and thereby predetermine differences in the willingness to become self-employed because they produce differences in the rate of return between men and women. Social capital in this sense is regarded as an individual characteristic which is on the one hand strongly determined by individual investment decisions (Lin 1999), but on the other hand socially biased by traditional role models like division of labor in families or among entrepreneurs. Women in Germany, for example, spend more time with children and parents, and their time budget is often more restricted than that of their male counterparts. Therefore, they have much less time to invest in social contacts in general and in business contacts in particular (i.e. Fasci and Valdez 1998, Rosa et al. 1994).⁷ On the other hand, women may have lower returns on social capital due to restrictions in an entrepreneurial role. One restriction particularly facing women but not men is the expected caretaker role of children and/or elderly parents or other household responsibilities (Boden 1999), which in turn leads to lower earnings in self-

employment (Hundley 2000; 2001). Accordingly, due to differences either in their costs and/or their earnings functions, women can be expected to invest in social capital differently than men. Therefore, if social capital is crucial for the willingness to become self-employed, these gender specific investment differences should lead to gender specific differences in the willingness to become self-employed. We thus have two hypotheses that will be tested in what follows.

Hypotheses:

- 1) The larger individuals' social capital investments are, the greater will be their willingness to become self-employed.
- 2) Women invest less in social capital than men and are therefore less willing to become self-employed than men.

Data and empirical results

We test our hypotheses with a very rich data set that we collected in the so-called Cologne Founder Study⁸. The dataset covers a sample of students from five universities in the metropolitan area of Cologne, which is representative for many metropolitan areas in Germany. The data set consists of 4,751 students (undergraduate and graduate level) and an additional 642 PhD candidates. The data were collected using a standardized questionnaire that included more than 300 variables and was sent out by mail in the middle of 1999. The dataset was ready in 2000. We have detailed data for all respondents on social capital investment, formal education and previous work experience (employed and self-employed). Furthermore, we collected data on respondents' preferences about whether to become self-employed or not, on their degree of risk aversion and on a large number of socio-economic characteristics, such as gender, mobility, regional embeddedness, importance of various job characteristics, perceived reputation of entrepreneurs, expected income, current (student) income and the preference for or the importance of academic freedom. The range of variables

is particularly helpful in measuring the (opportunity) cost of investing in social capital and in controlling for a number of individual constraints and opportunities.

Methodology

Dependent Variable: willingness to become self-employed

Since students usually do not make their final occupational decision while still studying and are in most cases neither an entrepreneur nor an employee, we can only measure their “willingness to become an entrepreneur”. However, as many empirical studies have shown, actual entrepreneurs are a sub-sample of the so called set of nascent entrepreneurs.⁹ Thus, someone who has never thought about becoming an entrepreneur is almost certain not to become self-employed. And someone who thought about becoming self-employed at an early stage of his occupational decision-making has a significantly higher probability of becoming an entrepreneur later on. As other studies show, individuals’ early entrepreneurial intention or willingness is the single best predictor for later real entrepreneurial behavior and starting a business (Villanueva et al. 2005, Krueger and Reilly 2000, Wagner 2005, Franke and Lühje 2002, Görisch 2002, Welter and von Rosenbladt 1998; a more detailed overview of various studies can be found in Isfan and Moog 2003). Hence our results concerning the willingness to become an entrepreneur can be interpreted as a lower bound of the probability of actually becoming an entrepreneur.

Our dependent variable “willingness to become an entrepreneur” contains four different degrees of an individual’s attitude or activity regarding self-employment. The ordered multinomial variable “willingness” is defined by four values: “1 = never thought of becoming an entrepreneur” – this means the individual only considers becoming an employee, “2 = considered becoming entrepreneur, but still without a business idea”, “3 = have a concrete business idea, but have not taken any concrete steps towards a realization”, “4 = have a concrete business idea and am actively engaged in the start-up process, i.e. have already taken

first steps towards the realization of the business idea (such as talking to first customers, writing a business plan, searching for financial support, etc.)”¹⁰ Thus the more concrete a person’s business idea is, and the more activities a person has undertaken, the higher is his or her “willingness to become self-employed”, which is an ordered multinomial variable ranging from 1 as the lowest degree of willingness to become self-employed to 4 as the highest degree of willingness. Because of the particular characteristics of this dependent variable we use ordered probit regression models to test our hypotheses. However, the descriptive results in table 1 already point to the importance of gender aspects.

Insert table 1 here

Almost 35 percent of the students had not even thought of the possibility of becoming an entrepreneur. Another 20 percent considered self-employment as a future option but did not have a business idea; these might be individuals who prefer to work first as an employee and later on may switch to self-employment. A further 23 percent had a business idea but were not actively pursuing the start-up process. Finally, 20 percent had a business idea and were already actively involved in the start-up process. Comparing men and women in their willingness to become self-employed, we observe striking differences in the distribution. The percentage of women not even considering self-employment is substantially higher than that of men (29.01 % of all men to 42.68 % of all women in the dataset). On the other hand, the percentage of women with a high willingness to become self-employed is lower than that of men (24.72 % of all men to 16.17 % of all women in the dataset). In other words, we observe considerable variation in the willingness to become self-employed, both in general and gender specifically.

Independent variables

Investments in social capital

Social capital in our article is regarded as an individual characteristic (similar to human capital)¹¹ and less as a network. Since social capital is more or less intangible, it is difficult to measure directly. In the literature it is defined very heterogeneously and results depend on the definition used (Baron and Hennan 1994). The same is true for our analysis, which is why we first describe our dependent variable in detail. We use a number of proxies to measure the stock and different kinds of investments in social capital.¹²

The *stock of social capital* is operationalized by the kind and number of contacts a person holds. Fortunately, we are not restricted to one quantitative variable, but have a variety of variables to choose from. We are able to distinguish three different kinds of social capital which the respondent considers to be useful in the case of the entry into working life, i.e. social capital measured as the number of “contacts from studying”, “contacts from family and friends” and “business contacts”.¹³ Furthermore, we have information on whether a respondent has contact with people who are self-employed and can distinguish whether a person has self-employed parents or self-employed friends¹⁴ (cf. table 2).

Insert table 2 here

With regard to gender differences, we observe a higher number of all kinds of social contacts for men than for women and a higher number in every single area. However, the ranking in the number of contacts is similar for men and women, i.e. most contacts are found in the context of family and friends, followed by business contacts and by university contacts.

To capture differences in *investments* in social capital we use a set of variables that can be assumed to be a proxy for investments in social relations and networks. For example mobility or embeddedness can be assumed to have an impact on the quantity and/or quality of social capital and therefore on the willingness to become self-employed. Therefore, we use the

number of universities a person has studied at (including studying abroad) and the number of years a person has lived in a region (embedddness and embeddedness squared) as a proxy for social capital investments.¹⁵ We also account for investment opportunities resulting from studying together with other peers, such as the number of semesters studied (and semesters squared in the case of non-linear effects), the type of degrees a person holds and the field of study,¹⁶ as well as age (and age squared) to capture lifecycle effects.

Since we expect gender specific differences in the investment or stock of social capital we include gender as an important explaining dummy variable in our first model. In the second model we apply a switching regression approach to account for structural differences between men and women.

Control variables

We control for risk aversion measured by the importance of having a safe job and/or a foreseeable income since being an employee or being self-employed carry along very different risks. In addition, we control for expected income, and for the expected income loss from a job as an employee compared to self-employment, as well as for the importance of intellectual freedom. As control variables we also use dummy variables for marriage and children. Furthermore, we use regional economic indicators which may also have an effect on the willingness to become an entrepreneur (cf. table 3).

Insert table 3 here

Empirical results

As a first step towards gaining information on whether there might be significant differences between men and women in their stock of and investments in social capital and thereby their willingness to become self-employed, we compare the means of men and women.

Insert table 4 here

Our descriptive analysis shows significant differences between men and women in almost every social capital variable and in their willingness to become self-employed. Women and men differ significantly in their number of contacts. Women have (at a highly significant level) a lower number of university contacts than men, fewer family-and-friend contacts and fewer business contacts who might be useful in the start-up process. The variable indicating whether men and women have friends or an acquaintance working as an entrepreneur shows that women have less contact with self-employed people than men. However, the differences between men and women are not significant with respect to contact with family or parents who are self-employed. This is not astonishing, because one is born into a family, and males and females are equally likely to be born into a self-employed family (there is no active decision taken in either case, so we do not expect differences).

We observe even stronger gender differences in the variables regarding mobility and socio-economic status: women remain in the same region for shorter time-spans than men, they change their university more often (including going abroad)¹⁷, they are younger and, moreover, they differ significantly in their preference for different study fields. The last effect in particular might be important for the willingness to become self-employed. As previous studies have shown, women prefer fields of study where fewer entrepreneurial activities potentially arise.¹⁸ Moreover, by analysing the risk aversion of men and women we find that for women it is significantly more important to have a guarantee of employment, foreseeable income and promotion on a long term perspective. To summarize, the descriptive results provide first evidence that men and women differ substantially in their social capital (in investments and stock) and in other factors like risk aversion, as well in their willingness to become self-employed.

Therefore we first estimate an ordered probit regression of the willingness to become self-employed on our social capital and control variables and include a dummy variable for gender (women = 0, men = 1) to catch the overall gender effect (cf. table 5). We use ordered probit regressions since our dependent variable has four discrete values (1 = highly willing to become self-employed, 4 = not at all willing to become self-employed). In a second step we estimate an ordered probit exogenous switching regression model for males and females to study the effects of different social capital investments of women and men (cf. table 6). By separating women and men into two different parallel regressions we can catch the effect of being a man or a woman and of their different investments in social capital separately. The gender-specific equations for the willingness to become self-employed are

$$Y^*_s = \beta_s x' + v_s \text{ with } s = 0, 1 \text{ (female, male)}$$

where x' is a vector of explanatory variables that is the same in both equations and β_s are the gender-specific coefficients. The gender specific error term v_s measures unobservable heterogeneity. This is a typical switching regression framework where we either observe willingness to become self-employed for men or willingness to become self-employed for women. It is a logical impossibility to observe the willingness of a woman to become self-employed if she were a man. However, the observed difference in an individual's willingness to become self-employed as a man or a woman is precisely the gender specific willingness factor and the term $\beta_s x'$ deliver the different influence of social capital and other factors we are interested in. Differences in slopes in the latter regression (cf. table 6) across the gender groups are entirely due to gender heterogeneity, which has to be accounted for in the interpretation of the results (Roy 1951; Lüchinger, Stutzer and Winkelmann 2006).

Insert table 5 here

Looking at the results of the first regression (cf. table 5)¹⁹, we find that all the social capital variables have the expected positive signs and turn out to be significant. The number of university contacts, family contacts and business contacts all positively influence the willingness to become self-employed. The same effect occurs if an individual has a self-employed person among his family or friends. Our control variables mainly confirm results of previous studies.²⁰ Overall we can conclude that hypothesis 1 is borne out in the data: the more social capital a person holds, the more willing he or she is to become self-employed. As regards gender specific differences we find that the dummy variable “male” has a strong positive effect on the willingness to become self-employed, which provides evidence confirming hypothesis 2. To study the size of the effects we can look at the marginal effects, i.e. by comparing the estimated predictions for a representative individual for a one unit change in the respective variable. The representative (the average) respondent shows a willingness of 2.77, which means he or she is close to category 3 and has a concrete idea of starting a business but has not yet taken steps to set up the business. If we change the variable “having an entrepreneurial friend” to “no or yes”, the average willingness decreases to 2.6 in the first case (no entrepreneurial friend) and increases almost to 2.9 in the latter case (having entrepreneurs among the friends). If we change the variable gender to “female or male” the willingness to become self-employed decreases to 2.6 for females and increases to almost 3.0 for males. This gender effect is a very strong effect, which becomes obvious if we compare it, for example, with the change in the variable “business contacts” that would be needed to arrive at a similar effect. If the number of business contacts is raised from the average of 2.6 contacts up to 10 (as a four times higher number of business contacts), the overall willingness only increases to 2.8. It also shows that having an entrepreneur among one’s friends is far more important than just having a great number of business contacts. Looking closely only at these selected variables and marginal effects we think, we can clearly show the effect of social capital as well as gender on the willingness to become self-employed.

In the next step we estimate ordered probit switching equation models to account for structural differences between women and men we discussed before in this article. Here, we use the Chow test to test whether the regression parameters differ significantly between men and women.²¹ The Chow test yields a value of 52.16, indicating that there are indeed strong structural differences between men and women.

Insert table 6 here

The results of this switching regression (see table 6 column 2 for men and column 3 for women) provide even more convincing evidence for hypothesis 2, that men and women differ in their social capital and accordingly in their willingness to become self-employed (which is heavily dependent on social capital). The most important and significant variable for the stock of social capital for both women and men is again “having entrepreneurial friends”. Such contacts with entrepreneurial friends as peers strongly increase the willingness of both men and women to become self-employed. However, the effect is much stronger for women than for men. The same picture emerges for contacts with family and friends. The more contacts with family and friends a person has (men or women), the higher their willingness to become self-employed, but for women the effect is more than twice as strong as for men. These results indicate that women take greater advantage of their social contacts once they have them. However, from our descriptive results we know that women have fewer contacts than men. And if we calculate the marginal effects we find that taken together, women’s willingness to become self-employed is lower than that of men due to their lack of social capital. On the other hand, we find that men are more affected than women in their willingness to become self-employed by having an entrepreneurial parent. We suspect that this reflects traditional family structures, where parents prefer to hand over a running company to the “first son” or

“the male heir”. This result could provide a clue as to why the variable “entrepreneurial parents” often plays an ambiguous role in many studies which do not differentiate between men and women.

We observe different results for men and women for regional embeddedness, which is said to have a positive impact on accumulating social capital and therefore on the willingness to become self-employed. According to our results regional embeddedness has a positive effect for men only. We suspect that this is due to the fact women more often than men might change regions in order to follow their partner to another town and thereby lose important contacts. Therefore, changing regions might have a negative impact for females but not for males. The dummy variable children shows a strong positive impact on willingness only for men (similar results have been found in other studies for the success of start-ups), which can be assumed to be due to still very traditional role patterns in Germany. It is often argued that children bring a higher rate of responsibility into men’s lives, which causes them to make more reasonable and more success-oriented decisions in order to be able to support their family. For men this can mean starting their own business. At the same time, for women, having a child leads to the opposite reaction because they expect to take on the responsibility for the child and therefore may decide against starting their own business due to time constraints and higher costs.

Furthermore, we find an interesting result for risk aversion. High risk aversion as measured by a strong preference for a foreseeable income or career decreases the willingness of both men and women to become self-employed. However, the negative risk aversion effect is stronger for men than for women. If we look again at the marginal effects we first have to calculate the willingness to become self-employed for the typical (average) male and the typical female. The willingness to become self-employed for an “average” male is 2.88 and for an “average” female is 2.25. To measure the ceteris paribus or marginal effect of a rise in the number of contacts (family and friends) of an otherwise “average” man or woman, we

enhance the mean value up to 10 people and find an increase to 2.97 for men and of 2.47 for women, i.e. women clearly catch up with men since the gender difference decreases from approximately 0.65 to 0.5. The same effect can be shown if we increase the number of business contacts for men and women from the average value up to 10. The women's willingness increases to 2.4 and that of men to 2.9. Women catch up in their willingness, too, when we change the variable having an entrepreneurial friend from the average value to yes=1, having a self-employed friend: in this case the willingness of an average woman increases up to almost 2.4 and that of a man up to 2.9. Again the distance in the willingness between men and women decreases having this social contact. Thus, we can conclude that women gain disproportionately more in their willingness to become self-employed by increasing their social capital because their marginal effects of social capital are comparatively large. However, since the level of social capital today is still much lower than that of men, the willingness to become self-employed is much lower for women than for men. Taken together this clearly confirms hypothesis 2.

Conclusion

The purpose of this article was to explain differences in the willingness to become self-employed by using social capital as an explanatory variable. Although the decision to become self-employed has been frequently analyzed in previous studies, social capital and its impact on the willingness to become self employed has been widely neglected. We argue that the willingness to become self-employed strongly depends on a person's stock of and investment in social capital. Further, we are the first to argue that since for a variety of reasons women invest differently in social capital than men, these differences in social capital are crucial in explaining gender differences in the willingness to become self-employed. Both our hypotheses are borne out in the data. The willingness to become self-employed is significantly

higher for people with more social capital, and the willingness of women to become self-employed is lower than that of men due to a lower level of social capital. However, since our data are limited with regard to the intensity of the social contacts, we cannot differentiate between strong or weak ties or between levels of trust or reciprocity; what we can confirm is that even the mere quantity of social contacts already has a positive impact on the willingness to become self-employed. It is reasonable to assume that the quality of social capital also has a significant impact, but this remains to be studied in the future.

Overall, women seem to suffer from a lack of social capital in comparison to men and are therefore less willing to become self-employed. Thus, policy measures intended to encourage the entrepreneurial contacts of potential entrepreneurs in general, and of women in particular, should be an effective instrument to increase the willingness to become self-employed. Teamwork with founders in entrepreneurship courses, the study of real start-up cases, business fairs, and similar activities are ways to build in these findings into a curriculum.

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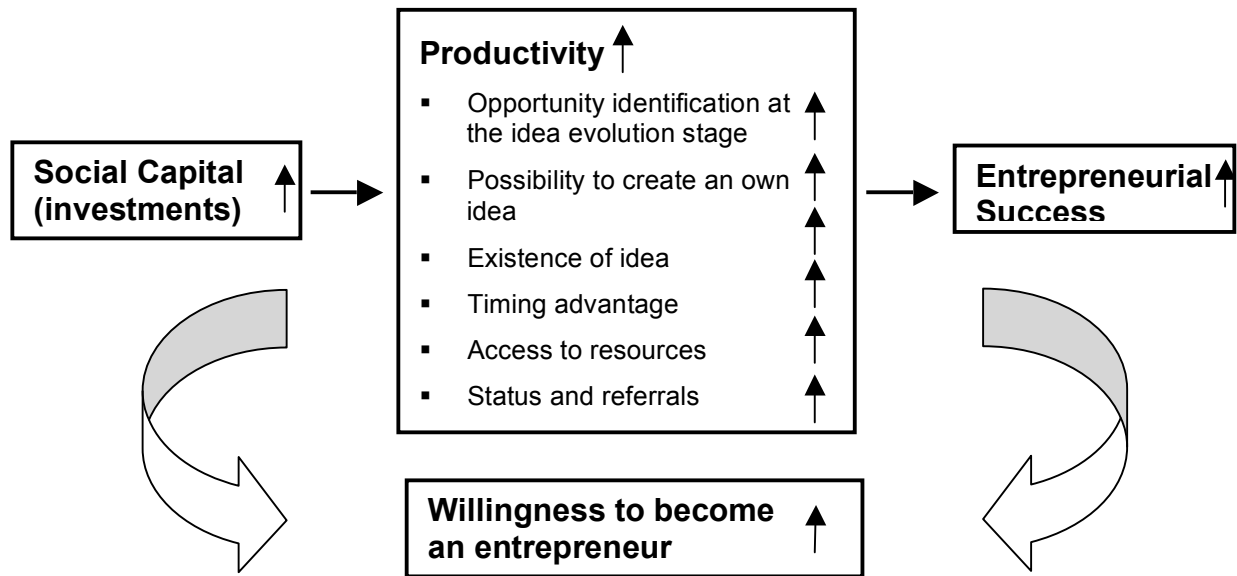
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Appendix

Figure 1: Investment in social capital and willingness to become an entrepreneur



Own depiction 2005.

Table 1: Willingness to become self-employed – descriptive statistics

Willingness to become self-employed		Low			High	Overall
		1	2	3	4	
Number of students (n)		1,854	1,099	1,209	1,093	5,255
% of all students		35.28	20.91	23.01	20.80	100.00
Men	n	825	646	670	703	2,844
	%	29.01	22.71	23.56	24.72	100.00
Women	n	1,029	453	539	390	2,411
	%	42.68	18.79	22.36	16.17	100.00

Own calculations based on Cologne Founder Study, 2005.

Table 2: Social capital of men and women – descriptive statistics

Number of contacts related to...	... studying	... family and friends	...business	Overall
Average: overall Std. dev.	1.92 (sd 6.33)	3.23 (sd 8.00)	2.63 (sd 5.88)	7.78 (sd 11.99)
Average: Men	2.28***	3.55***	3.31***	9.14
Women	1.47***	2.84***	1.77***	6.08
Rate: Men	24.95 %	38.84 %	36.21 %	100 %
Women	24.17 %	46.72 %	29.11 %	100 %

Own calculations based on Cologne Founder Study, 2005.

Table 3: Dependent and independent variables: descriptive statistics

Variables	Meaning and measure	Mean	SD
Willingness to become self-employed	Four types of willingness: 1 = low willingness to become self-employed (means high willingness to become employee) 2 = less willingness to become self-employed 3 = higher willingness to become self-employed 4 = highest willingness to become self-employed	35.28 20.91 23.01 20.80	10.23 12.45 10.58 14.29
Gender_dummy	Dummy variable indicating whether a person is a woman (= 0) or a man (= 1)	0.543	0.498
University contacts	Count variable for number of contacts a person has in the university	1.922	6.333
Family&friends contacts	Count variable for number of family members and friends	3.233	8.003
Business contacts	Count variable for number of contacts in the business world	2.628	5.878
Entrepreneur_family	Dummy variable indicating whether a person has an entrepreneur in his close family	0.295	0.456
Entrepreneur_friend	Dummy variable indicating whether a person has an entrepreneur in his circle of friends	0.649	0.477
Age	Numeric variable for years of age	27.132	5.504
Age (squared)	Squared variable for number of years of age	766.48	383.069
Regional_embeddedness	Number of years lived in the same region	14.911	11.3801
Regional_embeddedness (squared)	Squared numeric variable for number of years lived in the same region	351.83	404.946
Bachelor_dummy	Dummy variable indicating whether someone has attained the bachelor degree	0.568	0.495
PhD_dummy	Dummy variable indicating whether someone is involved in a PhD programme	0.120	0.325
Semesters	Numeric variable for number of semesters studied since the first enrolment at university	8.408	6.075
Semesters (squared)	Squared numeric variable for number of semesters studied since the first enrolment at university	107.59	167.535
Change_university	Count variable for number of university changes, including changes to universities abroad; values range from 0 to 5	0.290	0.633
Arts&Music	Dummy variable indicating whether a person's main study courses are in Arts & Music	0.068	0.252
Mathematics&Natural Sciences	Dummy variable indicating whether a person's main study courses are in Math & Natural Sciences	0.175	0.380
Social Sciences	Dummy variable indicating whether a person's main study courses are in Law & Economics	0.199	0.399
Sports	Dummy variable indicating whether a person's main study courses are in the field of Sports	0.038	0.191
Humanities	Dummy variable indicating whether a person's main study field is Humanities or Linguistics/Culture	0.257	0.437
Political Science and Sociology	Dummy variable indicating whether a person's main study field is Political Sciences & Sociology	0.087	0.282
Technical Sciences	Dummy variable indicating whether a person's main study field is Technical Sciences	0.175	0.380

Kids_dummy	Dummy variable indicating whether a person has children (=1) or not (= 0)	0.105	0.307
Married_dummy	Dummy variable indicating whether a person is currently married (=1) or not (= 0)	0.122	0.327
Financial_situation	Ordered multinomial variable with 7 categories, defining a person's current annual income, ranging from 1 (up to 7'700 €) to 7 (> 20'000 €)	2.107	1.622
Income_difference_dummy	Dummy variable indicating whether a person expects (= 1) a higher salary from being self-employed than from being employed (= 0)	0.002	0.043
Academic_freedom	Dummy variable defining whether for a person academic freedom is important (= 1) or not (= 0)	0.421	0.494
Employment_guarantee	Dummy variable indicating whether a person considers a long-term employment guarantee as important (= 1) or not (= 0)	0.692	0.462
Foreseeable_income	Dummy variable indicating whether a person considers a foreseeable, calculable income as important (= 1) or not (= 0)	0.599	0.490
Foreseeable_promotion	Dummy variable indicating whether a person considers promotion opportunities in his/her job as important (= 1) or not (= 0)	0.638	0.481
Product	Dummy variable indicating whether a person attaches importance (= 1) to the possibility of realizing his/her own business idea or not (= 0)	0.662	0.473
Public_esteem_dummy	Dummy variable indicating whether a person attaches importance (= 1) to admiration and esteem/status from the public or not (= 0)	0.264	0.441
Classes	Dummy variable indicating whether a person is familiar with entrepreneurial classes and workshops at his/her university (= 1) or not (= 0)	0.330	0.470
Colloquia	Dummy variable indicating whether a person is familiar with entrepreneurial colloquia at his/her university (= 1) or not (= 0)	0.119	0.324
Profs	Dummy variable indicating whether a person knows the professors holding entrepreneurial classes at his/her university (= 1) or not (= 0)	0.389	0.488
Transfer	Dummy variable indicating whether a person is familiar with the (technology) transfer centre at his/her university (= 1) or not (= 0)	0.058	0.233
GO!	Dummy variable indicating whether a person is familiar with GO!, a NRW political program	0.162	0.369
Initiative	Dummy variable indicating whether a person is familiar with the entrepreneurial initiative	0.163	0.370
NUK	Dummy variable indicating whether a person is familiar with NUK (business plan competition in the region)	0.051	0.219

Own calculations based on Cologne Founder Study, 2005.

Table 4: Means conditioned by gender for dependent and independent variables

Variables	Men	Women	Significance Level of Difference
T-statistics			
Willingness to become self-employed			
1 = low willingness	29.01	42.68	***
2 = less willingness	22.71	18.79	***
3 = higher willingness	23.56	22.36	***
4 = highest willingness	24.72	16.17	***
University	2.279	1.475	***
Family & friends	3.549	2.839	***
Business	3.311	1.769	***
Entrepreneur_family	0.288	0.303	
Entrepreneur_friend	0.665	0.629	***
Age	27.499	26.699	***
Age (squared)	784.081	745.647	***
Regional_embeddedness	16.269	13.331	***
Regional_embeddedness (squared)	395.318	301.145	***
Bachelor_dummy	0.553	0.586	***
PhD_dummy	0.125	0.113	*
Semesters	8.755	7.992	***
Semesters (squared)	116.401	97.061	***
Change_university	0.274	0.307	**
Arts & Music	0.0475	0.093	***
Mathematics & Natural Sciences	0.196	0.151	***
Social Sciences	0.256	0.131	***
Sports	0.039	0.036	
Humanities	0.137	0.399	***
Political Science and Sociology	0.078	0.098	***
Technical Sciences	0.246	0.092	***
Kids_dummy	0.102	0.109	
Married_dummy	0.117	0.128	
Financial_situation	2.248	1.933	***
Income_difference_dummy	0.002	0.001	***
Academic_freedom	0.415	0.428	
Employment_guarantee	0.668	0.721	***
Foreseeable_income	0.572	0.631	***
Foreseeable_promotion	0.596	0.674	***

Product	0.672	0.651	*
Public_esteem_dummy	0.269	0.257	
Classes	0.371	0.278	***
Colloquia	0.147	0.084	***
Profs	0.413	0.359	***
Transfer	0.064	0.050	**
GO!	0.194	0.123	***
Initiative	0.201	0.117	***
NUK	0.061	0.037	***

Own calculations based on Cologne Founder Study, 2005.

*Significance at 10%-level, **Significance at 5%-level, ***Significance at 1%-level

Table 5: Ordered probit regression: willingness to become self-employed

Variables	Coefficients
Gender_dummy	.290***
University contacts	.009**
Family&friends contacts	.017***
Business contacts	.011*
Entrepreneur_family	.180***
Entrepreneur_friend	.226***
Age	.108***
Age (squared)	-.001***
Regional_embeddedness	.0189**
Regional_embeddedness (squared)	-.001**
Bachelor_dummy	-.0271
PhD_dummy	-.201**
Kids_dummy	.175*
Financial_situation	.049***
Employment_guarantee	-.322***
Foreseeable_income	-.214***
Product	.433***
Public_esteem_dummy	.114**
Profs	.088*
Initiative	.160**
NUK	.299***
Model Fit	Number of obs: 2305 Wald chi2(38): 606.04 Prob > chi2: 0.0000 Log pseudo-likelihood: -2822.658 Pseudo R2: 0.100

Own calculations based on Cologne Founder Study, 2005.

We show here only the theoretical important and mostly significant variables. The complete regression tables are available on request from the authors.

Table 6: Ordered probit exogenous switching regression

Variables	Coefficients – Men	Coefficients - Women
University contacts	.007	.028
Family&friends contacts	.014**	.029***
Business contacts	.007	.017
Entrepreneur_family	.292***	.156*
Entrepreneur_friend	.238***	.300***
Age	.115***	.081
Age (squared)	-.001***	-.001
Regional_embeddedness	.022**	.013
Regional_embeddedness(squared)	-.001**	-.000
Bachelor_dummy	-.048	.035
PhD_dummy	-.424***	.133
Kids_dummy	.276**	.079
Financial_situation	.078***	.004
Employment_guarantee	.377***	-.241**
Foreseeable_income	.199***	-.233**
Product	.449***	.397***
Public_esteem_dummy	.067	.172**
Profs	.079	.100
Initiative	.224***	.025
NUK	.312**	.368*
Model Fit	Number of obs: 1308 Wald chi2(37): 410.55 Prob > chi2: 0.0000 Log pseudo-likelihood: -1608.15 Pseudo R2: 0.108	Number of obs: 997 Wald chi2(37): 230.67 Prob > chi2: 0.0000 Log pseudo-likelihood:-1194.93 Pseudo R2: 0.09

Own calculations based on Cologne Founder Study, 2005.

We show here only the theoretical important and mostly significant variables. The complete regression tables are available on request from the authors.

Notes

¹ Thus many studies show that a major effect of social capital consists of trust (Coleman 1988; Granovetter 1985). Trust forms a bonding glue that holds people together. Trust allows the parties to assume that each will take actions that are predictable and mutually acceptable (i.e. Powell 1990). This reduces transaction costs. Trust also affects the depth and richness of exchange relations, especially for information (Saxenian 1994). Because of this positive impact on information flow, trusting behaviour as an effect of social capital is often cited and seen as a critical factor in enhancing innovation through collaboration (Lorenzoni and Lippari 1999); this might enhance the success of start-ups and also influence the willingness to become an entrepreneur knowing about the advantages of these effects. We do not have the chance in this article to elaborate on trust in the context of social capital; but we do not know of any study on entrepreneurial willingness that deals with trust, so we cannot refer to any results. However we expect fruitful contributions if it becomes possible to operationalize trust and include it in similar studies.

A second aspect of social capital consists of ties often providing resources like information and a bridging lubricant (Putnam 2000). Granovetter in his classic work (1973) emphasises the importance of maintaining an extended network of weak ties in obtaining resources like information. Weak ties in this context are defined as loose relationships between individuals. They are useful in obtaining information that would otherwise be unavailable or costly to locate. Weak ties are opposed to strong or close ties which could be found in a nuclear family, like siblings, parents or wife and husband. These kinds of ties provide secure and consistent access to resources. If we follow the distinction between strong and weak contacts, we can say that strong contacts help an individual at the moment of the real funding process and afterwards. These strong contacts offer reliable emotional support. . We count as strong contacts those contacts with family and friends (private and university) as well as with one's wife or husband. As weak contacts we count business contacts as well as contacts to information institutions in the university or the region such as start-up competitions, chamber of commerce, business development agencies, consultancies, banks, etc. Operationalizing strong and weak contacts in this way we follow the ideas of Hoang and Antoncic (2003:171f.) or Davidsson and Honig (2003:308). Thus we could interpret some of our variables and results as strong and weak ties like Davidsson and Honig (2003). But we think such a measurement is too loose for this complex construct. Therefore we stick with our more quantitative definition of social capital and are sure we can provide a contribution to this new research field working in this way.

² Lerner and Almor (2002) or Brush and Hisrich (1999) also find differences in female or male founders' management strategies while running their company.

³ In the sense of REM, a nascent entrepreneur is defined as someone who is - alone or with others - actively involved in starting a business that will belong to him or her. The business should not have paid full time wages or salaries for more than three months (Wagner 2004:9). In contrast, see our definition later on. The survey Wagner works with is part of the REM 2003, which focuses on the extent of the difference in entrepreneurial activities between 11 so-called planning regions in Germany and includes 12,000 cases (Wagner 2004).

⁴ Moreover, we argue that social capital plays an important role in the decision to become self-employed because entrepreneurship is a socio-economic process and a social activity. Economic elements of entrepreneurship are conducted in a social web of parents and friends, potential customers/suppliers, lenders and employees, former colleagues and bosses, etc. (Anderson and Miller 2003). This is according to Greve and Salaff (2003), Carter et al. (2001), and Aldrich (1999), who state that social capital influences both the idea for a start-up and the actual founding.

⁵ Besides this element of social capital as a private good there is also the 'value' of the information exchanged in networks as well as the extent of outstanding obligations and the level of trustworthiness of the participants in the network (Nielsen 2003).

⁶ Even when there are at first sight strong differences between physical and social capital (Solow 1999), it can be argued that "...all forms of human-made capital (physical, human or social) share some common characteristics and that this makes it meaningful also to talk about social capital: they are created by spending time and effort in order to build assets today that increase income in the future. People form capital when they withhold resources from present consumption and use them instead to augment future consumption for (production) possibilities." (Bates 1990; Nielsen 2003).

⁷ We therefore control in the empirical part for marriage and children in the household.

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- ⁸ The student database is, along with another company database, part of a project supported by the German Research Foundation (DFG) in the context of “interdisciplinary start-up research”. We express our thanks to the Deutsche Ausgleichsbank (DtA -SME Bank), the Stadtparkasse Köln (Cologne Savings Bank) and the City of Cologne for their financial support. For more information on the project and the survey see Backes-Gellner, Demirer and Moog (2000).
- ⁹ A nascent entrepreneur is defined in a first step as an individual who has entrepreneurial ability and who might consider becoming an entrepreneur. The second level includes the existence of an affinity towards entrepreneurship and a first idea. This defines a potential entrepreneur who is still not involved in a start-up (see Reitan 1997; Aculai et al. 2004). From this group nascent entrepreneurs in the narrower sense emerge, being those individuals who are actively engaged in the start-up process, but who have not yet achieved an actual firm founding (Reynolds and Wight 1997; Reynolds 2000).
- ¹⁰ We measured the preference to become an employee or to become self-employed, as well as the probability of whether a respondent had already started an own business. The answers to these questions were highly correlated with the level of willingness. Therefore, the answers of the respondents were quite consistent. We consider the “funnel”-approach (following Welter 2000) to be more meaningful regarding the willingness to become self-employed in order to obtain a more differentiated picture of the current situation.
- ¹¹ This point of view is almost identical to the standard investment models of physical or human capital. This kind of economic approach will do well empirically to identify and to understand the investment and the stock of social capital because it provides a logical framework, as it did with physical and human capital. Glaeser, Laibson and Sacerdote (2001) showed that this model is valuable in explaining the relation of expected income and the level of investment in social capital.
- ¹² The same measure is used by Davidsson and Honig (2003).
- ¹³ The respondents were asked: “How many formal and informal contacts (number of individuals) could be useful for your entry into the labor force? stemming from university.: _____, from family or friends: _____ or from business: _____.”
- ¹⁴ The respondents were asked: “Are your parents or people from your circle of friends self-employed or have they ever been self-employed? Parents: yes/no; friends: yes/no.”
- ¹⁵ Therefore, as many regional entrepreneurship studies show, most entrepreneurs start their companies in the region where they have been living, working or studying in order to use the contacts they have (e.g., Saxenian 1994).
- ¹⁶ We use these human capital variables as investment variables in social capital, because there is a strong relation between social and human capital. This positive connection or correlation of human capital investment and social capital is one of the most robust empirical regularities in the social capital literature (Florin, Lubatkin and Schulze 2003, Helliwell and Putnam 1999).
- ¹⁷ These are typically important signals of a career as an employee in major companies (Backes-Gellner, Lazear and Wolff 2001).
- ¹⁸ Similar results are indicated by Strohmeyer (2003).
- ¹⁹ Tables 5 and 6 leave out the variables of minor or no significant importance for the theoretically discussion to make the article more interesting to read. Complete regression tables are available on demand from the authors.
- ²⁰ All variables measuring “risk aversion” are significant. The higher the risk aversion, the lower the willingness to become self-employed. This confirms the results of other studies regarding the impact of risk aversion on the willingness to become self-employed. We also find significant effects of the possibility of realizing one’s own business idea and the knowledge of the special support programme NUK on the willingness to become self-employed. The first effect matches results of earlier studies concerning the influence of realizing one’s own ideas (see Pinkwart 2001, Volmerig 1998, or Szyperki and Nathusius 1977). The second result, that the knowledge of special programs enhances willingness to become self-employed, confirms results by e.g. Franke and Lüthje (2002).
- ²¹ For further information on this procedure see Wooldridge (2003:239).