Is it both what you know and who you know?

Human capital, social capital and entrepreneurial success

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Abstract

This paper analyzes the importance of human and social capital for entrepreneurial success, using survey data of 459 urban entrepreneurs in Luanda, Angola. The paper offers four main findings: i) An added year of schooling significantly increases entrepreneurial profits. ii) Profits are substantially lower for entrepreneurs suffering from chronic illness. iii) Entrepreneurs who know a local police officer have higher profits, suggesting that specific forms of networks are related to entrepreneurial success. iv) Different family background variables are associated with the educational attainment of men and women, indicating that educational attainment is gendered.

Keywords: Entrepreneurship; returns to schooling; human capital; social capital; endogeneity; Angola

JEL Codes: L26, J24, C30

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1 Introduction

What types of capital do poor people need to be successful at business? An assumption underlying microcredit is that access to financial capital is a key constraint for entrepreneurs in poor countries. However, recent evidence from field experiments in developing countries suggests that the impact of financial capital on business outcomes may be contingent on the human capital of entrepreneurs. De Mel et al (2008) find the returns from a business grant to be higher for more formally educated and more able entrepreneurs. Berge et al (2010) find a positive impact of business training on profitability for male microcredit clients, but no effect for female clients. In this paper, we contribute to the literature attempting to identify causal effects of education, focusing on returns to formal schooling among poor entrepreneurs, and potential gender differences. Moreover, this is to our knowledge one of the first papers to explore empirically the association between entrepreneurial profits and other dimensions of human and social capital, notably health and social networks, in a developing country context.

The relationship between human and social capital and entrepreneurial success is analyzed using unique survey data collected among microcredit clients in Angola. The main contributions of the paper are three-fold. Firstly, few previous studies of entrepreneurial returns to education using survey data have addressed the fact that education is endogenous, leading to potentially biased estimates of returns to education (see e.g. the review article by van del Sluis et al, 2005). We instrument for education using a set of family background variables, in order to address this issue. Secondly, a closer look at the family background variables used as instruments in this paper reveals that their effect on education varies greatly between men and women. Instruments that indicate a general preference for education among parents (such as the availability of newspapers in the childhood home) mainly have an effect on the education of male entrepreneurs, while instruments indicating greater gender sensitivity among parents (such as the number of languages spoken by the father) mainly have an effect on the education of female entrepreneurs. This provides information on the gendered nature of educational attainment in Angola. Moreover, if there are heterogeneous returns to education, it underscores how using different family background instruments will identify returns for different groups, with potential implications also for the literature using family background variables to identify returns to education in wage work.[1]

[1] In contrast to the literature on entrepreneurship, empirical studies of wage returns to education have focused extensively on identifying causal effects, see e.g. Card (2001) for a review.

Thirdly, we present some initial evidence on two forms of capital neglected in the literature on entrepreneurship in developing countries. The health status of an entrepreneur would appear to have obvious implications for his or her productivity, at least in the case of debilitating, chronic illness. A sizeable proportion of our sample of entrepreneurs report suffering from chronic illnesses such as malaria or stomach disorders, and our results show that these entrepreneurs on average have significantly lower profits. As for social capital, we find that specific forms of networks are related to business success, notably knowing a local police officer, though the causal direction of this relationship may go either way. However, while previous studies suggest that entrepreneurs with more extensive networks do better in business (Fafchamps and Minten, 2002), we find no significant association between the extensiveness of networks and profits. We also examine whether trust, which is commonly seen as another dimension of social capital, has a relation to business profitability, but find no significant association.

The paper is structured as follows. Section 2 presents the contextual background of our study, and a brief review of the literature on entrepreneurial success, leading up to a presentation of the empirical strategy of the paper. Section 3 presents the data used and descriptive statistics. Section 4 presents our main results, followed by a discussion of gender specific effects, and robustness. Section 5 concludes with a look at implications for further research.

2 Background and methodology

The Angolan economy is heavily dominated by the oil industry, which comprises 44 per cent of the country's GDP and 97 per cent of its exports (IMF, 2011). Most scientific studies of the country have accordingly focused on the role of oil in the economy, and its implications for development. However, only a small proportion of the Angolan population is employed in industries directly related to oil extraction. The large majority make their living in other sectors, in agriculture, as employees in other sectors, or as small entrepreneurs. Very little is known about their situation and the constraints facing them, and it is hard to conduct empirical studies of these questions using existing data. There are no published household surveys to draw on and no real census has even been conducted in the country since 1970.

To assess the importance of human and social capital for small scale entrepreneurship in Angola, we therefore conducted a survey of entrepreneurs in the capital Luanda. In the absence of census or other population data, we used the client pool of the Angolan microcredit institution Kixicredito as our sampling frame. Kixicredito is the largest non-commercial microcredit institution in Angola. Established in 1999, it has a total of 8600 active clients in 12 branches across the country (African Development Bank, 2010). Kixicredito clients are organized in solidarity groups, and our survey covers 51 randomly selected groups in two branches in central Luanda, including a total of 539 clients.

The effect of human capital on labour market outcomes has been analyzed in a number of studies in the wake of the classic Mincer (1974) study. In the Mincer model, education has a positive impact on worker productivity, an idea that can be extended to productivity in entrepreneurship. The empirical setup used by Mincer has been applied in a number of studies of the impact of education on entrepreneurial profits. In a meta-analysis of studies from developing economies, van der Sluis et al (2005) finds that an added year of schooling increases profits by 5.5% across studies. In contrast to the literature on education and wages, however, most of these studies do not take into account the endogeneity of education, and therefore do not identify causal effects. A few recent studies addressing this issue suggest that returns to education may be substantially higher (van der Sluis et al, 2007; Kolstad and Wiig, 2010). While the effect of human capital in the form of education has been examined in a number of studies, the same is not true for the health dimension of human capital, whose effect on entrepreneurial success remains largely unexplored.

A number of studies argue that social capital leads to better economic outcomes (Putnam, 1993; Fukuyama, 1995; Knack and Keefer, 1997). While the meaning of the term is contested, in economic studies social capital usually refers to valuable networks or relationships an agent has, or trust exhibited between agents. Networks and trust both reduce transaction costs by facilitating the flow of information and the enforcement of contracts, which in theory could improve business success. An emerging empirical literature looks at the role of social capital in entrepreneurship in developing countries. In a study of agricultural traders in Madagascar, Fafchamps and Minten (2002) find that traders with a higher number of connections to other traders or to potential lenders have higher profits, whereas the number of family members in agricultural trade has no effect on profitability. This can be related to the strength of weak ties idea of Granovetter (1973), where weak ties are argued to be a source of more novel

information than strong ties. We revisit this idea by examining whether profits of Luandan entrepreneurs are associated with the number of ties they have, or ties to specific types of agents. A related finding from developed economies (e.g. Bauernschuster et al, 2010) is that the probability of entrepreneurship increases in the number of club memberships and individual has, and we examine the potential effect of organizational membership on entrepreneurial profits. In two studies of microcredit repayment, Cassar et al (2007) find that trust in other members of a credit group matters more for repayment rates than general social trust, and Karlan (2007) finds higher repayment among individuals with closer social connections to their fellow group members. We expand on these studies by looking at the relationship of entrepreneurial profits to within group trust and trust to outsiders, and to geographical proximity to other credit group members.

In estimating the effect of human or social capital on entrepreneurial profits, a key problem is that human and social capital are endogenous. If our measures of human or social capital are correlated with some unobserved element of the profit equation, ordinary least squares (OLS) estimates are biased. For education, unobserved ability may for instance bias OLS estimates upward as it may impact positively on both education and profits. Health may similarly be related to unobserved characteristics such as attitudes to risk, which may also influence business outcomes, or be inversely related to profits as more successful entrepreneurs can better afford treatment. For social capital, good networks may increase profits, but successful business may also generate better networks, and both variables may be influenced by unobserved characteristics of the entrepreneur.

Endogeneity can be addressed through instrument variable estimation, i.e. by using variables correlated with the endogenous explanatory variable but not with profits. In the literature on the impact of education on wage income, a number of family background variables and policy experiments have been used to identify the causal effect of schooling (Card, 2001). The question of identification has, however, received much less attention in the literature on entrepreneurship. In this paper, we attempt to identify the causal effect of education on entrepreneurial profits by using four family background variables as instruments for education: The number of languages spoken by the father of the entrepreneur, the education of the eldest sibling, the availability of newspapers in the home of the entrepreneurs during

childhood, and whether the father's main occupation was in farming.[2] Our data unfortunately does not include credible instruments for health or social capital, so results for these variables are to be interpreted as correlations rather than causal effects. As we shall see, however, the uncovered correlations point to some interesting patterns that should be explored further.

We apply a standard instrument variable estimation procedure to address the endogeneity of education, captured by equations (1) and (2). Education is first regressed on a vector of instruments Z_i and a set of covariates X_i.[3] Predicted education values from this estimation are then used in the profit equation, in addition to the covariates X_i. In addition to health and a measure of social capital, the vector of covariates X_i includes characteristics such as gender and financial capital (details are discussed in the next section). We also include dummies for credit group affiliation in all estimations to capture any group specific effects, and cluster standard errors at the group level.

$$education_i \quad _1 \quad _1 Z_i \quad _1 X_i \quad v_i \tag{1}$$

$$\ln(profits_i) \quad _2 \quad _2 education(predicted)_i \quad _2 X_i \quad _i \tag{2}$$

A good instrument for education needs to be highly correlated with education, but not related to any unobserved element of the profit equation. The number of languages spoken by the father, the educational level of the eldest sibling, and access to newspapers at home are indicators of a parental preference for education, which we expect to be positively related to an entrepreneur's level of education. Whether the father of the entrepreneur was a farmer is likely related to the opportunity of going to school, with an expected negative relation to education. All our instruments are highly correlated with education, passing standard tests of instrument strength. We cannot test whether our instruments are correlated with unobserved variables in the profit equation. While one concern may be that a favourable family background (where the father speaks several languages, the eldest sibling is more educated, and newspapers are available) may also facilitate the transfer of skills or motivation

[2] Van der Sluis et al (2007) use the availability of magazines in the household as an instrument in their study of entrepreneurial returns to education in the US, a more suitable instrument in a developing country context is availability of newspapers. Ashenfelter and Zimmerman (1997) use sibling education as an instrument in estimating returns to education among wage earners in the US.

[3] Results are reported using the full set of instruments, but the estimated effect of education is not very different when using the instruments individually.

conducive to running a successful business, our results are robust to the addition of covariates capturing other family members' skills in business, such as the father's level of education, and whether the father or any other close relatives have business experience. And while in principle having such a family background, or not growing up on a farm, may also mean that you live in a more central area where business opportunities are also more lucrative, our sample of entrepreneurs all live in central Luanda, and any unobserved geographic differences in profits will be captured by credit group dummies.

Our data does not permit us to control for selection bias, i.e. selection on unobservables into entrepreneurship. We only have data on profits for people who have chosen to be entrepreneurs, which need not be a representative sample of all potential entrepreneurs. If becoming an entrepreneur is affected by some unobserved variable correlated with unobserved elements of the profit equation, our estimates may be biased. Given the absence of census or other population data in Angola, however, this is a problem that is difficult to address. There is no way to draw a representative sample of entrepreneurs and non-entrepreneurs from a larger population, and using a Heckman selection model is therefore not feasible. Previous studies of entrepreneurial success suggest, however, that selection bias may not be too much of a problem (van der Sluis et al, 2007; Kolstad and Wiig, 2010).

3 Data

Data was collected through interviews with entrepreneurs in a period of six weeks in February to March 2010.[4] Two different branches of the Kixicredito operation, Sâo Paulo and Hoje Ya Henda, were selected. Both branches are close to the centre of Luanda, a pragmatic choice as costs of doing fieldwork in Angola are huge, due to a generally high price level and logistical difficulties created by extreme traffic congestion. Our results are therefore relevant to urban areas similar to the two covered, we cannot from our data tell whether the findings extend to peri-urban or rural entrepreneurs. From the two branches, a total of 51 credit groups were selected randomly, constituting about 60 per cent of all groups in the two areas. The groups were visited and interviews conducted at their bi-weekly meetings. While interviews were conducted with members from all groups initially selected, the majority but not all members of each group was available for interviews at the bi-weekly meetings. Interviews were conducted in Portuguese by local enumerators.

[4] The approach and questionnaire were tested and improved through a pilot in November 2009.

A total of 539 entrepreneurs were interviewed. After excluding entrepreneurs who report higher profits than sales (31 observations) and loansize higher than what the Kixicredito institution offers (1 observation), the sample is reduced to 507. From logging the profits, we lose an additional 22 observations with negative profits, and some missing values on the covariates and instruments cut the sample by an additional 26 observations, leaving us with a main sample of 459 observations. The variables used for the main estimations are summarized in Table 1. Our dependent variable is the log of the weekly profits reported by the owner. Education is measured as years of education, constructed from responses to a survey question of highest class attended. Health is measured through a dummy which takes the value 1 if the respondent reports to suffer from a chronic illness. Our main measure of social capital is a dummy capturing whether the respondent knows a local police officer. We control for gender, the size of the outstanding loan at Kixicredito (which can be taken as a proxy for financial capital), and work input by the entrepreneur as the number of days he or she operates the business during the week.[5] To address the question of robustness, further estimations also include dummies for the ethnic and linguistic background of the entrepreneur (not reported in Table 1).

Table 1. Main variables

Variable	Explanation
Dependent variable	
Profits	Reported profits last week (in Angolan Kwanza), logged
Independent variables	
Education	Years of education
Male	Dummy = 1 if owner is male
Loansize	Current outstanding loan at microcredit institution (in 1000 Angolan Kwanza)
Chronic illness	Dummy = 1 if reported to suffer from chronic illness
Days/week	Number of days per week owner operates business
Network police	Dummy = 1 if owner knows a local police officer
Instruments	
Father languages	Number of languages spoken by father
Sibling education	Years of education of oldest sibling
Newspaper	Dummy = 1 if newspapers were accessible at home during childhood
Father peasant	Dummy = 1 if father's main occupation was peasant

Summary statistics for the main sample are presented in Table 2. The weekly profits of the median firm is about 100 USD, and the mean about 200 USD. This is somewhat higher than in similar surveys from other developing countries, but consistent with the fact that Angola is an oil economy with a very high price level. The businesses are generally small, with a

[5] A number of other covariates included in initial specifications proved insignificant and were dropped from the main specification. These include the standard variables reflecting experience in the Mincer (1974) specification (age and age squared), as well as more direct proxies for business experience (number of years in business).

median of zero and a mean of 0.23 employees, the largest firm in the sample has 15 employees (not shown in table). Almost 95 per cent of the main sample are involved in various kinds of retail sales, some in combination with simple manufacturing or service provision, the rest are involved in manufacturing (of clothes, food, furniture and more) or services (hairdressing, beauty salons, transport and more).

The average (and median) entrepreneur in our sample has seven years of education, an outstanding loan of about 1000 USD (which corresponds to the average loan size in Kixicredito), and operates his or her business about six days a week. Female entrepreneurs constitute 62 per cent of our sample, eight per cent report suffering from a chronic illness, and almost 70 per cent knows a local police officer. As for family background variables, the father of the average entrepreneur spoke two languages, the eldest sibling had almost six years of education, 39 per cent had regular access to newspapers at home during childhood, and 32 per cent had a father whose main occupation was in farming. There are no statistically significant differences between means of the main sample and the original sample of 539 entrepreneurs, suggesting that the main sample is representative of the entrepreneurs interviewed.

Table 2. Summary statistics

Variable	Obs	Median	Mean	Std. dev.	Min	Max
Profits	459	10000	19222.04	26820.13	0.00	279000.00
Education	459	7	6.90	3.89	0.00	17.00
Male	459	0	0.38	0.49	0.00	1.00
Loansize	459	93	92.55	76.18	0.06	744.00
Chronic illness	459	0	0.08	0.27	0.00	1.00
Days/week	459	6	5.75	0.96	0.00	7.00
Network police	459	1	0.69	0.46	0.00	1.00
Father languages	459	2	2.35	0.88	1.00	6.00
Sibling education	459	5	5.87	5.15	0.00	17.00
Newspaper	459	0	0.39	0.49	0.00	1.00
Father peasant	459	0	0.32	0.47	0.00	1.00

Note: Profits are in Angolan Kwanza earned over the past week. Education and sibling education are years of schooling. Loansize is in 1000 Angolan Kwanza. Days per week is the number of days a week the owner operates the business. Male, chronic illness, network police, newspaper, father peasant are dummy variables. Father languages is number of languages spoken by father.

4 Results

4.1 Main results

The results from the two stages of our main IV estimation are presented in the first two columns of Table 3 (called IV-regression 1). The next three columns add dummies for ethnicity (IV-regression 2), dummies for language (IV-regression 3), and dummies for both

ethnicity and language (IV-regression 4).[6] The first stage results of these regressions are not reported as they are quantitatively similar to those in the first column. The final column presents OLS estimates for purposes of comparison.

Table 3. Main regression results

	IV-regression 1		IV-regression 2	IV-regression 3	IV-regression 4	OLS
	First stage	Second stage	Second stage	Second stage	Second stage	
Dependent variable	*Education*	*Profit/logged)*	*Profit(logged)*	*Profit(logged)*	*Profit(logged)*	*Profit(logged)*
Education		0.087**	0.071*	0.094**	0.077*	0.037**
		(0.04)	(0.04)	(0.04)	(0.05)	(0.02)
Male	2.614***	-0.311*	-0.241	-0.317*	-0.245	-0.137
	(0.34)	(0.16)	(0.15)	(0.16)	(0.15)	(0.15)
Loansize	0.005***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Chronic illness	-0.496	-0.327*	-0.343*	-0.319*	-0.342*	-0.375*
	(0.53)	(0.19)	(0.20)	(0.19)	(0.20)	(0.19)
Days/week	0.044	0.088	0.092	0.097	0.109*	0.116*
	(0.15)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Network police	0.265	0.232*	0.247*	0.242*	0.263*	0.276**
	(0.29)	(0.13)	(0.14)	(0.13)	(0.13)	(0.13)
Father languages	0.453**					
	(0.17)					
Sibling education	0.074**					
	(0.03)					
Newspaper	1.123***					
	(0.31)					
Father peasant	-1.737***					
	(0.35)					
Constant	5.339***	7.836***	9.103***	9.008***	10.429***	11.365***
	(0.94)	(0.40)	(0.67)	(0.35)	(0.70)	(0.72)
Group dummies	Yes	Yes	Yes	Yes	Yes	Yes
Ethnic dummies	No	No	Yes	No	Yes	Yes
Language dummies	No	No	No	Yes	Yes	Yes
R-sq.	0.530	0.273	0.307	0.277	0.322	0.331
N	459	459	459	459	459	459

*Cluster robust standard errors in parentheses. *** indicates significance at the 1% level, ** at 5%, * at 10%. Profits are in Angolan Kwanza earned over the past week. Education and sibling education are years of schooling. Loansize is in 1000 Angolan Kwanza. Days per week is the number of days a week the owner operates the business. Male, chronic illness, network police, newspaper, father peasant are dummy variables. Father languages is number of languages spoken by father.*

As the first column shows, all four instruments for education have a highly significant relationship with education. The number of languages spoken by the father, the education of the eldest sibling, and access to newspapers, all have the expected positive relation to education. Entrepreneurs whose father worked as a farmer have less education, as expected. An F-test of whether our instruments are jointly significant in the education equation yields an F statistic of 18.29, and tests of whether the instruments enter the education equation individually produce F values ranging from 13.34 for the education of the eldest sibling to 31.56 for the father peasant dummy, all well above the conventionally required level of 10 (cf. Staiger and Stock, 1997). The instruments are therefore sufficiently strong. In addition, a Sargan overidentification test does not reject the validity of our instruments.

[6] The credit groups are heterogeneous in their ethnic and linguistic composition, and people from the same ethnic group also use different main languages in their home.

The results in columns two through five in Table 3 suggest that the return to an added year of education among entrepreneurs is in the range from 7.1 to 9.4 per cent. This is consistent with IV estimates of the impact of education on wages, but higher than previous estimates of entrepreneurial returns to education in developing countries (van der Sluis et al, 2005). The point estimates of the IV regressions are also higher than the OLS point estimate of 3.7 per cent reported in the final column, however, the differences are not significant ($p = 0.20$). The estimates are significantly different from zero, suggesting a positive return to education among Luandan entrepreneurs.

Our results also indicate that human capital in the form of health has a significant association with entrepreneurial profits. The point estimates range from -0.319 to -0.343, indicating that entrepreneurs who suffer from some chronic illness have 27 to 29 per cent lower profits. It is important to stress that since health status is likely endogenous, these estimates should be taken as correlations rather than causal impacts. That there is an association between the health and profits of entrepreneurs is not discussed much in the literature on entrepreneurship. There are good theoretical arguments for a negative impact of health on the productivity and hence profitability of entrepreneurs, however, further empirical studies are needed to identify potential causal effects. On a different note, our data provide some more detail on which illnesses the respondents suffer from, and we substituted dummies for a few of these for the general chronic illness dummy in an attempt to disaggregate effects.[7] The results suggest that suffering from malaria, in particular, is associated with lower profits in the order of about 48 per cent. Entrepreneurs suffering from a stomach disorder also have lower profits, by about 34 per cent. For other afflictions, there are too few observations.

Our main indicator of social capital, whether an entrepreneur knows a local police officer, has a positive association with profits. Profits are 26-30 per cent higher for entrepreneurs that know a member of the local police. There are several reasons why entrepreneurs whose network include a police officer have higher profits. One possibility is that knowing a police officer provides access to local and/or legal information which helps entrepreneurs run their business more profitably. Quite conceivably, however, our results reflect reverse causality. Given the high level of corruption in Angola, and the extent of bribery in the police force, profitable businesses may be sought out by police officers seeking bribes. This would be consistent with the findings of Svensson (2003) from Uganda, where the bribes a firm pays

[7] Results available from authors on request.

increase in its profits. Since we have neither lagged values for our variables, nor instruments for social capital, we are not able to test the direction of causality in our case. Anecdotal evidence and more casual interviews we conducted with local entrepreneurs suggest, however, that the issue of police corruption is an important one in understanding constraints to entrepreneurship, which needs to be followed up in further studies.

The significance of the police network variable, suggests that business profits are related to having networks of a particular kind. We also have data on a range of other types of networks, whether the entrepreneur knows the manager or owner of a credit institution, of an NGO, or of a larger enterprise, and whether he or she knows a school teacher, local lawyer or politician. None of these networks have any significant relation to profits, nor is this the case for a wider network variable which captures the number of relationships an entrepreneur has. This lends some support to the conclusion that profits are related to having certain specific networks rather than having a network that is extensive. In other words, our data provide little evidence to suggest that the strength of weak ties argument applies to entrepreneurial profits. However, as an absence of a correlation does not imply the absence of a causal link, more work is needed on these issues. We have also tested whether being a member of different types of organizations (religious organizations, labour unions, political parties, professional organizations, cooperatives and more) has any relation to profits, and find no significant association. Nor is the degree of trust entrepreneurs express to people in general or to the members of their credit group, or their geographical proximity to or frequency of interaction with other groups members, related to the success of their business.

Of the other covariates, loansize has a significantly positive association with profits, reflecting either that access to capital is important to entrepreneurial success or that more successful entrepreneurs get more credit, or both. The coefficient for the male dummy is negative, suggesting that the female entrepreneurs in our sample do better than the male, but the coefficient becomes insignificant with the addition of covariates and this result is hence not very robust. The number of days per week the entrepreneurs spends on the business is insignificant in most estimations.

4.2 The gendered nature of education and its returns

If returns to education are heterogeneous, the above results using four different instruments are a weighted average of the returns for the groups whose education is affected by each of the instruments. However, running estimations with each of the instruments separately does not produce very different estimates, ranging from 6.5 per cent to 12 per cent, and estimates are not sufficiently precise to conclude that a difference exists between them. Though we cannot conclude that there are heterogeneous returns, however, exploring the effects of the instruments on different groups provides some further interesting information pertaining to the use of family background variables as instruments for education.

In particular, splitting the sample according to gender reveals some remarkable patterns in the effect of family background variables. Table 4 shows the results from running IV regressions separately for women (first two columns) and men (last two columns). A comparison of the first stages of the regressions (column one for women, and column three for men), shows that the number of languages spoken by the father, the educational level of the eldest sibling, and whether the father was a farmer, appear to have a stronger effect on the educational attainment of female entrepreneurs than male entrepreneurs. The difference in effects is statistically significant for the number of languages spoken by the father ($p<0.05$). On the other hand, the availability of newspapers in the childhood home of an entrepreneur, has a significantly stronger effect on the education of men than of women ($p<0.05$).

Table 4. Regressions for women and men

	IV-regression Women		IV-regression Men	
	First stage	Second stage	First stage	Second stage
Dependent variable	*Education*	*Profit/logged)*	*Education*	*Profit(logged)*
Education		0.095**		0.059
		(0.05)		(0.10)
Loansize	0.005***	0.002***	0.005	0.002
	(0.00)	(0.00)	(0.00)	(0.00)
Chronic illness	-0.257	-0.420*	-1.043	0.030
	(0.69)	(0.22)	(1.35)	(0.48)
Days/week	0.099	0.145**	0.240	-0.000
	(0.19)	(0.07)	(0.34)	(0.15)
Network police	-0.190	0.305*	1.354	0.181
	(0.41)	(0.18)	(0.81)	(0.26)
Father languages	0.623**		0.018	
	(0.27)		(0.36)	
Sibling education	0.109**		0.068	
	(0.04)		(0.05)	
Newspaper	0.637		2.076***	
	(0.48)		(0.55)	
Father peasant	-1.843***		-1.142	
	(0.46)		(0.80)	
Constant	1.970	9.368***	3.972	8.130***
	(1.39)	(0.64)	(2.53)	(0.75)
Group dummies	Yes	Yes	Yes	Yes
R-sq.	0.472	0.373	0.540	0.368
N	285	285	174	174

*Cluster robust standard errors in parentheses. *** indicates significance at the 1% level, ** at 5%, * at 10%. Profits are in Angolan Kwanza earned over the past week. Education and sibling education are years of schooling. Loansize is in 1000 Angolan Kwanza. Days per week is the number of days a week the owner operates the business. Male, chronic illness, network police, newspaper, father peasant are dummy variables. Father languages is number of languages spoken by father.*

The effect of family background variables on education thus seems to be gender specific. A possible explanation for this is that there is discrimination against women either in parental preferences or social norms for education, or in later labour market outcomes. The availability of newspaper in a home likely reflects a general preference for education. And if women are discriminated against, parents with a general preference for educating their kids may choose to keep their sons in school but not their daughters, captured by the strong effect of newspaper availability on the educational attainment of men. The number of languages spoken by the father, on the other hand, is likely associated with a more cosmopolitan outlook, with a higher degree of gender sensitivity on the part of the parent. And all else equal, parents whose perspectives are more sensitive to gender inequality are more likely to send their daughters to school, reflected by the strong effect of paternal language skills on the education of women.

Our results thus have implications for the understanding of education choices, and the use of instruments in the study of entrepreneurial (or other) returns to education. The results in column two of Table 4 suggest that the returns to education for female entrepreneurs are about 9.5 per cent. Or, to be more precise, these are weighted average returns for the female entrepreneurs moved into education by the three instruments affecting female education. The

results in the fourth column feature a point estimate for the returns to education among male entrepreneurs of 5.9 per cent, but the estimate is too imprecise to be significant at conventional levels. While the point estimates suggest that the returns to education for female entrepreneurs may be higher than for males, the estimate for women is not significantly different from that for men ($p = 0.44$), and we therefore cannot conclude that education has a greater effect for women than men. Moreover, if there is heterogeneity in returns within each gender, the returns picked up by our instruments may not reflect average returns in each group, making general comparison of the two groups difficult.

An additional observation in comparing results in columns two and four in Table 4, is that while the results for the covariates for women are similar to those for the general population, none of the covariates at the individual level are significant in explaining difference in profits among men. Nevertheless, the explanatory power is about the same in both regressions, with an R-squared around 0.37. This suggests that the group dummies, capturing differences in characteristics and dynamics between credit groups, are more important in explaining differences in profits between men, than among women. In other words, individual characteristics such as education, chronic illness, and access to capital are relatively more important in explaining how well women do in business, while group characteristics are relatively more important in explaining the success of men.[8] This pattern is confirmed by dropping the group dummies from the regressions, in which case the R-squared for the regression for men drops to 0.02, whereas for women it drops to 0.13. Thus, while group characteristics are important in explaining the success of entrepreneurs of both genders, they seem relatively more important in explaining the success of men.

This seems contrary to some standard intuitions on gender differences, where women are typically seen as more socially embedded than men. However, one explanation for this result may be that female entrepreneurs are not necessarily representative of the female population. If discrimination against female entrepreneurs exists, only the most independently minded among the potential female entrepreneurs may actually become and remain entrepreneurs. This is in line with the more general observation that in the face of gender related obstacles to entrepreneurship, "only women with well above average entrepreneurial skills find it

[8] One explanation for the insignificance of individual characteristics for men is that there may be less within-group variation in these variables for males. However, with the exception of chronic illness, the network variable, and the father peasant variable, we do not find evidence of less variation in individual characteristics in groups dominated by men.

attractive to self-select into entrepreneurship" (Guiso and Rustichini, 2011:1). If this is the case, there is a clear selection problem in estimating the effect of group characteristics and dynamics on entrepreneurial success. In other words, the above results for men and women on the relative importance of group characteristics may be heavily biased. More generally, this means that while previous studies have found little evidence of a selection bias in estimating returns to individual characteristics such as education, selection is something that should be taken seriously in estimating causal effects of group characteristics.

4.3 Robustness of results

One possible concern in calculating returns to education among poor entrepreneurs is that the respondents may not give accurate answers on the profits from their business. An alternative proxy for business success is sales, which are typically easier to calculate (see de Mel et al (2009) for a discussion of profits versus sales data). To check the robustness of our results, we report estimations using the log of weekly sales as the dependent variable in Table 5. The first and second column present results for all 480 businesses for which we have sales data, while the third column presents results for the sample for which we have both profit and sales data (first stage not reported as this is practically the same as in Table 3). As the results show, the estimated effect of education on sales is consistent with previous results on profits, an added year of education raises sales by 10-11 per cent. Of the covariates, only loansize is significant, but the other variables have the same sign as in the estimations using profits as the dependent variable.

Table 5. Regressions using sales as dependent variable

	IV-regression 1		IV-regression 2
	First stage	Second stage	Second stage
Dependent variable	*Education*	*Sales(logged)*	*Sales(logged)*
Education		0.099**	0.116***
		(0.04)	(0.04)
Male	2.642***	-0.192	-0.254
	(0.34)	(0.16)	(0.15)
Loansize	0.004***	0.002***	0.002***
	(0.00)	(0.00)	(0.00)
Chronic illness	-0.216	-0.064	-0.021
	(0.46)	(0.17)	(0.20)
Days/week	-0.026	0.087	0.075
	(0.16)	(0.06)	(0.06)
Network police	0.188	0.156	0.161
	(0.27)	(0.12)	(0.13)
Father languages	0.541***		
	(0.16)		
Sibling education	0.079***		
	(0.03)		
Newspaper	1.088***		
	(0.32)		
Father peasant	-1.616***		
	(0.35)		
Constant	5.630***	9.126***	8.673***
	(0.97)	(0.35)	(0.37)
Group dummies	Yes	Yes	Yes
R-sq.	0.518	0.331	0.328
N	480	480	458

*Cluster robust standard errors in parentheses. *** indicates significance at the 1% level, ** at 5%, * at 10%. Sales are in Angolan Kwanza earned over the past week. Education and sibling education are years of schooling. Loansize is in 1000 Angolan Kwanza. Days per week is the number of days a week the owner operates the business. Male, chronic illness, network police, newspaper, father peasant are dummy variables. Father languages is number of languages spoken by father.*

Returning to the estimations using profits as the dependent variable, robustness of the results in Table 3 were tested by adding a number of additional covariates (variables reflecting entrepreneur characteristics such as age, marital status, business experience, ability; business characteristics such as registration status and number of employees; other proxies for networks and social capital, and more). None of these additional variables proved significant. Moreover, their addition only marginally changed the estimated returns to education, which remained highly significant in all estimations. The size and significance of the loansize variable was similarly unaffected. While significant in most estimations, knowing a police officer become insignificant in some estimations, as did chronic illness if only marginally so. In sum, our main results seem fairly robust.

5 Concluding remarks

What you know affects how well you do in business. The results of this paper suggest that the positive link between education and entrepreneurial profits is a causal one, thus expanding on previous work on entrepreneurial success where education has implicitly been assumed to be

exogenous. Consistent with comparable studies in the literature on wage employment, our IV estimates for the effect of education are higher than OLS estimates, though in our case not significantly so. If entrepreneurial returns to education are heterogeneous, this may reflect larger returns for the groups whose educational attainment is affected by our instruments. Splitting the sample by gender reveals that different family background variables are associated with the educational attainment of men and women. Variables that indicate a general preference for education among parents have a greater effect on the education of male entrepreneurs, whereas variables reflecting greater gender sensitivity among parents have a greater effect on the education of female entrepreneurs. While we cannot conclude that returns to education are significantly different for female and male entrepreneurs, our results suggest that the determinants of business success may be quite different for men and women. Individual characteristics appear relatively more important in explaining how well women do in business, while group characteristics are relatively more important in explaining the success of men. This is surprising as the conventional view sees women as more socially embedded than men.

Business success seems to be related more to who you know, than how many people you know or who you trust. The association between knowing a police officer and having higher profits is remarkable, but the mechanisms behind this should be explored in further studies. Anecdotal evidence suggest that the causality here may run from profits to knowing the police, but this of course needs to be tested more explicitly. Moreover, due to the endogeneity of social capital variables, we cannot based on our results rule out a causal effect of other network or trust variables. Though finding sources of exogenous variation in social capital has proved difficult in the context of our study, this may be easier in other contexts. Social capital in the form of networks should also be amenable to field experiments to test for any causal effects on entrepreneurial success.

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