

THE IMPACT OF SOCIAL CAPITAL ON ENTREPRENEURSHIP AMONG SMALLHOLDER FARMERS IN RURAL SOUTH AFRICA

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ABSTRACT

This paper investigates the effect of social capital on entrepreneurship among smallholder farmers in rural South Africa. Farmers gain access to social capital through memberships in both agricultural and non-agricultural groups. A total of 513 households were randomly selected in three districts and the data were analysed using the zero inflated Poisson and instrumental variable probit models. The estimated results indicated that access to social capital was influenced by factors such as age, education, asset values, attitudes towards groups, market access, irrigation, training and distance to the nearest extension office. The results also indicated that access to social capital had a positive effect on entrepreneurship. An additional group membership was associated with an increase of 11 per cent on the chances of being an entrepreneur. The study findings suggest that promoting memberships in local associations or clubs can play a positive role in stimulating entrepreneurship among smallholder farmers in the rural areas of South Africa.

Keywords: Social Capital, Farmer Groups, Entrepreneurship, Smallholder Farming, South Africa

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Introduction

There is general consensus on the importance of entrepreneurship for improved employment, food security and rural poverty reduction among smallholder farming households (McElwee and Bosworth 2010; Khayri et al. 2011; Baumgartner et al. 2012; Díaz-Pichardo et al. 2012; Bruton et al. 2013). While there is no generally accepted definition of entrepreneurship, this study adopts the Organisation for Economic Cooperation and Development (OECD) definition, which defined an entrepreneur as an individual who seeks to generate value through the creation or expansion of economic activity by identifying and exploiting new products, processes or markets (Ahmad and Hoffman 2007). An entrepreneurial smallholder farmer is thus not subsistence-oriented, but is characterised by market orientation (producing new products, targeting niche markets, etc.), post-harvest processing and value addition, diversification of economic activities and vertical integration in the modern value chains (Haugen and Vik 2008; Díaz-Pichardo et al. 2012).

Against the backdrop of rural poverty, household food insecurity, hunger, inequality and unemployment in South Africa, the government has prioritised stimulating entrepreneurship as a key to solving these problems (DED 2011; Dzansi et al. 2015). For example, among the expected outcomes of the Integrated Food Security Strategy (IFSS) are that the poor should own or manage farming operations and rural enterprises, and that these operations become more competitive and profitable (Hendriks 2014). The government's New Growth Path also emphasised

the expansion and commercialisation of smallholder agriculture, setting a target of establishing 300,000 additional market-oriented smallholder producers by 2020 (DED 2011). However, entrepreneurship levels have remained low in the country in general and among smallholder farmers in particular (Herrington et al. 2015).

The choice for smallholder farmers to be entrepreneurial in their farming activities depends on a number of factors, such as regulations and institutions, individual skills and abilities as well as asset endowments (Mair and Marti 2009; Bauernschuster et al. 2010; Díaz-Pichardo et al. 2012). Moreover, in small rural communities where smallholder farmers reside, social capital is very important. Social capital refers to the networks, norms, and trust that enable participants to act together more effectively to pursue shared interests and enhance the compatibility of incentives that allow exchange to happen in the absence of formal contracts or legal enforcement (Carter and Maluccio 2003; Kim and Kang 2014). The rural areas are characterised by informal institutions, information asymmetries and missing or imperfect credits markets, and the institutional arrangements that support entrepreneurship are either absent, weak, or fail to accomplish the role expected of them (Mair and Marti 2009; Bauernschuster et al. 2010; Baumgartner et al. 2012).

In these communities, personal contacts and social networks may help entrepreneurs to overcome resource constraints and provide an informal way for them to access information,

insurance and credit support (Bauernschuster et al. 2010; Chantarat and Barrett 2012; Díaz-Pichardo et al. 2012). According to Ahlerup et al. (2009), in development among the poorest countries or communities, social capital can be a substitute for weak formal institutions. Social capital may lead to efficient economic transactions as it reduces uncertainties and information asymmetry between parties engaged in transactions (Fafchamps 2006; Kim and Kang 2014). Social capital can thus stimulate entrepreneurship by increasing the entrepreneur's confidence in the self-enforcement of informal agreements or contracts (Bauernschuster et al. 2010; Kim and Kang 2014).

Despite the importance of social capital in promoting entrepreneurship among smallholder farmers, research has barely investigated the empirical links between the two in the smallholder sector. Studies focusing on the non-smallholder farming sector and other regions outside Africa are available (e.g., Mair and Marti 2009; Bauernschuster et al. 2010; Kim and Kang 2014; Al Mamun et al. 2016). In South Africa, studies have focused on the impact of social capital on outcomes such as household welfare (Maluccio et al. 2000; Baiyegunhi 2014), nutritional status of children (Carter and Maluccio 2003), schooling decisions (Di Falco and Bulte 2015) or consumption and accumulation decisions (di Falco and Bulte 2011). Research in other African countries has also neglected the potential impact of social capital on entrepreneurship, with studies examining the impact of social capital on outcomes such as technology adoption (e.g., Isham 2002; Bandiera

and Rasul 2006; van Rijn et al. 2012) or strategies for risk mitigation (e.g., Di Falco and Bulte 2013; Wossen et al. 2016).

The empirical results on the impact of social capital on different outcomes have been mixed. Studies which captured social capital in terms of networks based on voluntary cooperation (e.g., Maluccio et al. 2000; Carter and Maluccio 2003) have found positive impacts, while those focusing on the kinship networks (e.g., di Falco and Bulte 2011; Grimm et al. 2013; Di Falco and Bulte 2015) have reported negative impacts. The latter studies posit that kin ties have negative incentive effects on entrepreneurs because they are obligated to share the results of their success, the so called 'forced solidarity' or 'forced redistribution' hypothesis. This study focuses on voluntary social networks.

The subject of entrepreneurship has also not been extensively investigated in the rural smallholder farming context in Africa, in general, and South Africa, in particular. The few studies on entrepreneurship in Africa have not fully captured the totality of entrepreneurship, with most studies focusing on self-employment in urban areas (see Nagler and Naudé (2014) or Pato and Teixeira (2013) for a discussion). Entrepreneurship in rural areas has particular attributes and challenges (e.g., long physical distances to the market and dense social networks of mutual control) which are different from that of urban areas (Baumgartner et al. 2012).

The objective of this study was to investigate the impact of access to social capital on entrepreneurship among smallholder farmers

in the KwaZulu-Natal (KZN) province of South Africa. These smallholder farmers were selected because they operate under conditions of resource constraints; and are located in rural areas where formal institutions are poorly developed and traditions and informal institutions are predominant. In this context, it is important to understand how social capital through voluntary associations or groups helps the smallholder farmers operate within existing institutions to overcome hurdles and be entrepreneurial. Research on the causal impact of social capital on entrepreneurship is also characterised by endogeneity issues (Fafchamps 2006; Bauernschuster et al. 2010). This study addresses the endogeneity concerns using the instrumental variable method in an attempt to establish plausible causal effects of social capital on entrepreneurship. The competency-based approach was used to generate a contextualised entrepreneurship index for the rural areas of South Africa.

Methodology

Data: The data included 513 smallholder farmers drawn from three districts of the KZN province in South Africa. The survey was conducted using a two stage sampling technique. First, three districts were purposively selected out of the 11 districts in KZN. The districts chosen were Harry Gwala, Umzinyathi and Uthukela. These selected districts have a significant number of rural households engaged in smallholder farming. Second, a total of 513 farmers were randomly selected from the three districts. The lists of farmers were obtained from the extension

offices.

The data were collected during the months of October and November 2014 using a structured questionnaire. The questionnaire was administered by experienced enumerators who spoke the local IsiZulu language, who were trained before the survey. Questionnaire pre-testing, involving 15 rural households, was also done before the main survey. The ambiguities or difficulties with regards to question wording were noted and remedied during questionnaire pre-testing. The questionnaire included household demographics and socio-economic characteristics (e.g., age, gender, household size, etc.); household income and wealth endowment (e.g., household assets, livestock, land, etc.); institutional and organisational support structures/ services (e.g., farmer groups, market access, credit and extension support, etc.); and self-assessed entrepreneurial competences.

Theoretical Framework: Farmers in the rural areas of South Africa gain access to social capital through membership in farmer groups, stokvels (savings clubs), burial societies and other social associations. Participating in these groups or clubs is associated with potential costs (membership fees, time, etc.) and benefits (better access to information, inputs, collective bargaining, etc.), which may be perceived differently across households (Fischer and Qaim 2012; Fischer and Qaim 2014). Individual comparative advantage plays an important role in the decision to join groups or clubs (Fischer and Qaim 2012). The decision to be a member of a group was modelled in a random utility framework (Mc

Fadden 1974). According to the random utility theory, a farmer decides to be a group member if the utility from group membership (U_G) is greater than that of non-membership (U_{NG}). In other words, a farmer chooses group membership if the net utility (U) is greater than zero. Even though net utility is unobserved, it can be expressed as a function of observable elements in the following latent variable model:

$$U_i^* = \beta x_i + \varepsilon_i, U_i = 1 \text{ if } U_i^* > 0 \quad (1)$$

Where: U_i is a binary indicator variable that equals 1 for household i in case of group membership and 0 otherwise, β is a vector of parameters to be estimated, x_i is a vector of household and farm characteristics and ε_i is an error term.

There are various pathways through which groups or social networks might enhance entrepreneurship. For example, social networks may result in improved information flow, informal access to finance or insurance, access to market intelligence or contract monitoring and enforcement as well as provision of friendship or other intrinsically valued services (Bauernschuster et al. 2010; Chantarat and Barrett 2012). Social capital through voluntary cooperation plays a positive role in entrepreneurship development especially in areas where the formal institutions of information and credit support are underdeveloped, such as rural areas. Rural and small communities typically lack formal institutions that are able to collect and condense information to evaluate the entrepreneur's performance and prospects in order to provide

entrepreneurial finance independent of personal contacts (Bauernschuster et al. 2010). The frequent interactions among group networks help to overcome information asymmetries and thus provide an informal way to access entrepreneurial finance (Michelacci and Silva 2007; Bauernschuster et al. 2010). According to Díaz-Pichardo et al. (2012), social capital helps agricultural entrepreneurs to overcome weak institutions and achieve the collective efficiency necessary to overcome infrastructure or resource constraints prevalent in rural areas.

Dependent and Independent Variables:

Entrepreneurship was captured using the competency approach, an approach which has become increasingly popular in studying entrepreneurship among small businesses dominated by the entrepreneur (Phelan and Sharpley 2012; Sánchez 2012; de Lauwere et al. 2014). Competencies refer to the ability to perform specific tasks. A total of 24 entrepreneurial competencies were identified, and the farmers were asked to rate the extent to which they agreed that they possess these competencies. This was done using a five-point Likert scale ranging from 1 (strongly disagree), through to 5 (strongly agree).

Table 1 presents the list and summary statistics of the entrepreneurship competencies that were considered in this study. The entrepreneurial competencies were categorised, following Man et al. (2002), into the strategic, opportunity, relationship, conceptual, organising, and commitment competencies. Strategic competencies are those skills that help an

entrepreneur to set, evaluate and implement the vision, goals and strategies of the business, while opportunity competencies are about information seeking and recognising opportunities in the market (Man et al. 2002; Al Mamun et al. 2016). Relationship competencies refers to the ability to cooperate successfully with others. This entails being able to persuade, communicate and use contacts and connections (Man et al. 2002). Conceptual competencies are those related to understanding complex information, make decisions and being innovative and a risk-taker, and organising competencies are those related to the organisation of resources. Commitment competencies are those that drive the entrepreneur to move ahead with the business (Man et al. 2002; Al Mamun et al. 2016).

Table 1 shows that the farmers were somewhat negative about their entrepreneurial competencies, with the average scores ranging

between 2.2 and 3.6 for all the competencies. This means that farmers generally disagreed or were neutral on whether they possessed the listed entrepreneurial competencies. In particular, the results indicate that the respondents disagreed that they possess the strategic, conceptual and opportunity competencies, while they were mostly indifferent about their relationship, organising and commitment competencies. The 24 competencies were merged together into an index using principal component analysis (PCA). For easy interpretability, the entrepreneurial index formed from these competencies was used to categorise farmers into two groups, those who are relatively highly entrepreneurial and those who are not. The 40 per cent percentile was used as the cut-off point. The households above the cut-off were considered more entrepreneurial, while those below the cut-off were considered less entrepreneurial.

Table 1: Summary Statistics of the Entrepreneurship Competencies

Variable	Mean	Std.Dev.
Strategic competencies		
Goal and vision setting	2.45	1.42
Strategy formulation	2.85	1.40
Profit orientation	2.84	1.42
Growth orientation	2.72	1.44
Long-term or sustainability orientation	2.70	1.42
Opportunity or information seeking competencies		
Market orientation	2.78	1.25
Environmental scanning	2.24	1.22
Opportunity recognition	2.88	1.37
Relationship competencies		

(Contd.....)

Table 1 (Contd.....)

Co-operation and networking	3.21	1.32
Using networks and connections	3.04	1.35
Negotiation and persuasiveness	3.19	1.24
Conceptual competencies		
Initiative, creativity and innovativeness	2.75	1.33
Understanding complex information	2.78	1.35
Risk taking	3.12	1.40
Organising competencies		
Communication clarity	3.37	1.38
Vision clarity	3.66	1.33
Competitiveness and results orientation	3.21	1.34
Flexibility and willingness to adapt	3.19	1.34
Commitment competencies		
Business passion	3.45	1.33
Long and irregular hours	3.53	1.33
Motivation and ambition	3.50	1.30
Willingness to learn new things	3.51	1.28
Accountability	3.31	1.37
Emotional coping	3.61	1.35

Social capital was proxied by a variable that counts the number of a farmer’s memberships in groups or clubs, following studies such as Maluccio et al. (2000), Carter and Maluccio (2003) and Bauernschuster et al. (2010). This included both agricultural groups (farmer associations, marketing groups, etc.) and non-agricultural groups (savings clubs, burial societies, religious groups, women or youth groups, etc.). Most of these groups are multi-purpose, helping the farmers to access information, secure inputs, access credit, sell their produce or cope emotionally. Kinship networks were not considered in this study because these are

typically involuntary and not based on reciprocity (di Falco and Bulte 2011; Grimm et al. 2013). Other variables that might influence social capital, or an individual’s entrepreneurship status, such as the individual’s training, education, family background and other demographic variables, were also included in the models.

Empirical Models : The instrumental variable probit model was used to estimate the effect of social capital on a farmer’s entrepreneurship status as follows:

$$E_i^* = y_i'\gamma + z_i'\theta + \varepsilon_i \quad [2]$$

Where: E_i^* is the entrepreneurship status of farmer i , which takes the value of 1 if a farmer is an entrepreneur, 0 otherwise; y_i is the number of group memberships of farmer i ; z_i is a vector of covariates; γ and θ are parameters to be estimated and ϵ_i is the residual term.

When estimating Equation 2, omitted variable bias is a major concern. This is because unobserved heterogeneity between individuals may influence both membership in associations and the propensity of being an entrepreneur (Fafchamps 2006; Bauernschuster et al. 2010). For example, the people who are self-motivated, active and energetic are more likely to join local clubs or groups. Due to the same character traits, these same people are likely to be entrepreneurial (Bauernschuster et al. 2010). If this is not accounted for in the model, the estimated results will be biased due to omitted variables (Greene 2003). To address these endogeneity concerns, this study used the instrumental variable approach. Several social capital impact studies (e.g., Carter and Maluccio 2003; Kim and Kang 2014; Wossen et al. 2016) have used the instrumental approach to control for endogeneity issues.

The instrumental approach involved estimating a zero inflated Poisson model with membership in farmer groups (y_i) as a dependent variable, and then replacing y_i in Equation 2 with its predicted value (\hat{y}_i). The limitation of the Poisson model is that it imposes a restrictive assumption that the conditional variance equals the conditional mean. Observed data almost always violates this equidispersion assumption,

usually displaying pronounced overdispersion (i.e., the variance greater than the mean) (Chin and Quddus 2003; Greene 2009). However, the data in this study (Table 2) show that the mean and variance are not very different. The estimation of the negative binomial model showed that the Likelihood Ratio test on alpha ($p=0.498$) was insignificant, showing no evidence of overdispersion. The Poisson model was therefore, preferred over the negative binomial model as the former makes fewer assumptions than the latter (Greene 2009).

The zero inflated Poisson model was estimated instead of the standard Poisson model because of the excessive zeros in the study data (60 per cent of the farmers indicated that they were not members of any group or club (Table 2)). Figure 1 gives a histogram for the number of group memberships of the farmers, and shows a preponderance of zeros in the data. The zero inflated Poisson model is preferred because the distribution of group membership frequencies may be qualitatively different from the traditional Poisson distribution due to the existence of an overrepresentation of zero counts in the data (Chin and Quddus 2003). The Vuong test (Vuong 1989) done to compare the zero inflated model with an ordinary Poisson regression model was significant ($z = 5.10, p=0.00$), indicating that the zero inflated model is better.

The excessive zeros in the data might be because of some farmers who may never join a group because they have an inherent dislike or negative attitudes towards groups ('certain zero' group), and farmers who may or may not join

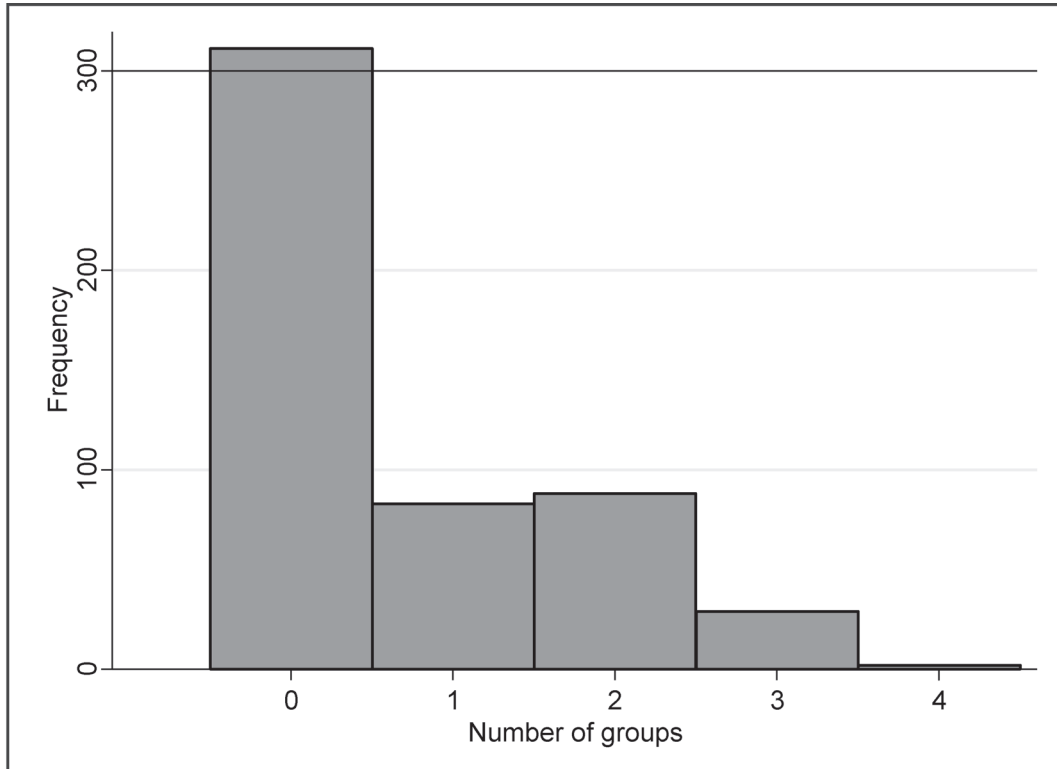


Figure 1: Histogram for Group Membership Frequency

groups, depending on circumstances. Not all households find it worthwhile to link to others, while some fail in their efforts to build a network (Chantarat and Barrett 2012). This suggests a two level decision process, the regime (i.e., whether one belongs to the ‘certain zero’ group or otherwise) and the event count (the number of group memberships).

The logit model was used to model the regime (i.e., whether one belongs to the ‘certain zero’ group or otherwise) and the Poisson regression was used to model the number of groups joined. The logit model was estimated as

follows:

$$\begin{aligned}
 d_i^* &= w_i^1 \delta + u_i^1, \\
 d_i &= 1(d_i^* > 0), \\
 \text{Prob}(d_i = 0 | w_i) &= \pi_0(w_i^1 \delta), \\
 \text{Prob}(d_i = 1 | w_i) &= 1 - \pi_0(w_i^1 \delta)
 \end{aligned}
 \tag{3}$$

Where: d_i^* is the latent selection variable which equals 1 when a farmer is a member of at least one group, 0 otherwise; w_i is a vector of covariates, δ are coefficients to be estimated, π is the cumulative probability distribution and u_i are the residuals.

The latent Poisson model was estimated as follows:

$$y_i^* | x \sim P(y_i^* | x),$$

$$E(y_i^* | x) = \exp(\alpha + x_i^* \beta) = \lambda_i \quad [4]$$

Where: y_i^* is the latent count variable, x_i is a vector of variables, α and β are coefficients and λ_i is the mean.

For identification reasons, the zero inflated Poisson model was estimated with two additional variables that were not included in the probit model (Equation 2). A variable capturing attitudes towards working as groups and distance to the nearest government or NGO office were used as instruments. It was hypothesised that those with positive attitudes towards participating in groups are more likely to join groups, while those with negative attitudes have less chances of joining groups. The distance to a government or NGO office captured ease of access to information about the benefits of membership in groups. As already highlighted, most groups in the rural areas have been externally initiated by government or NGO agents. The two variables are expected to thus influence membership in groups but are not expected to directly influence entrepreneurship.

Results and Discussions

Descriptive Statistics: Table 2 presents the descriptive summary of the farmers that were interviewed. The Table shows that 40 per cent of the farmers were members of at least a group or club. Further analysis indicated that, among

members, 43 per cent were members of agricultural groups (producer associations and marketing groups), while 32 per cent were members of stokvels (savings club). Over 13 per cent belonged to religious or church groups, and the remaining 13 per cent belonged to other groups such as burial societies, women and youth groups. The membership count variable shows that, on average, each farmer was a member to just under a group. However, farmers belong to more than 1.5 groups if only group members are included.

The Table shows that the farmers averaged 57 years in age and that 44 per cent of the households were males. This implies that the youth and men are less involved in smallholding farming activities in the rural areas of South Africa, as has been reported by other studies (e.g., Aliber and Hart 2009; Sinyolo et al. 2014; Maponya et al. 2015). The farmers attained low levels of education, averaging less than five years of formal education. Their households were big, numbering around seven members. The farmers had access to below 2 ha of arable land, and owned small numbers of livestock and had assets of moderate values. The survey results also indicate limited access to support services such as extension, training and credit. Table 2 shows that 35 per cent of the farmers were irrigators. The results show that less than 20 per cent of the farmers had non-farm employment, and that just 3 per cent owned non-farm microenterprises. The Table also shows that the farmers had a low view of working as groups, as the average rating score was low.

Table 2: Descriptive Statistics of Sample Households (n=513).

Variable code	Variable name and description	Mean	SD
ENTREP	Entrepreneurship status (1=Entrepreneur)	0.58	-
GROUP	Member of at least one group or club (1=Yes)	0.40	-
GROUPNO	Number of group memberships per farmer (Count)	0.91	0.93
GROUPNOa	Number of group memberships among members (Count)	1.53	0.70
AGE	Age (Years)	57	13
GENDER	Gender (1=Male)	0.44	-
EDUCAT	Education level (Years)	4.54	4.11
HHSIZE	Household size (Numbers)	6.52	2.99
MARRIED	Marital status (1=Married)	0.44	-
LANDSZE	Land size (ha)	1.80	4.47
TLU	Livestock size (TLUs)	2.35	5.93
ASSETS	Value of assets (Rands)	79011	43862
FARMEXP	Farming experience (Years)	19.08	14.09
TOTINC	Annual total household income (Rands)	45706	28331
MARKET	Market access (1=Yes)	0.20	-
CREDIT	Access to credit (1=Yes)	0.33	-
EXTENSION	Access to extension (1=Yes)	0.38	-
TRAINING	Access to agricultural training (1=Yes)	0.43	-
ATTITUDE	Attitude towards social networks (Ratings: 0-5)	2.16	1.25
IRRIGAT	Access to water for watering crops (1=Yes)	0.35	-
EMPLOYED	Household head off-farm employment (1=Yes)	0.18	-
BUSINESS	Small non-farm business ownership (1=Yes)	0.03	-
HGWALA	Harry Gwala district (1=Harry Gwala)	0.48	-
UMZINYAT	Umzinyathi district (1=Umzinyathi)	0.15	-
UTHUKELA	Uthukela district (1=Uthukela)	0.37	-

^arefers to members of groups or clubs only.

Determinants of Social Capital, Zero Inflated Poisson Model Results: The zero inflated Poisson model was estimated to investigate the determinants of membership in groups or clubs, and the results are presented in Table 3. The dependent variable was a count variable, capturing the number of clubs or groups a farmer is a member of. The estimated model fits the

data reasonably well, since the LR χ^2 is statistically significant at the 1 per cent level. The significant Vuong test indicates that the zero inflated Poisson model is a better fit than the standard Poisson regression model. As suggested by Cameron and Trivedi (2009), the robust standard errors were reported.

The inflated model was the logit model, predicting whether or not a farmer is a 'certain zero'. The results indicate that increasing age was associated with decreasing odds that a farmer would be in the 'certain zero' group. This implies that older farmers are more inclined towards participating in groups than the younger farmers, and are less likely to be in the 'certain zero' category. The results also show that the educated farmers and those who have bigger households, own larger farms and have received training are

less likely to be in the 'certain zero' group. The educated farmers understand better the benefits of cooperation, and thus are more likely to be positive about participating in groups. Those with bigger families have more labour, and thus can afford to participate in different groups. Owners of big farms have more prospects to benefit from cooperation than those with smaller farms. Trainings increase the skills of the farmers, and possibly their understanding of the benefits of groups.

Table 3: Factors Determining Membership in Groups, Zero Inflated Poisson Model Results

Variables	Logit model		Poisson model	
	Coef.	Std.Err	Coef.	Std.Err
AGE	-0.260**	0.110	0.006	0.005
GENDER	0.505	0.542	0.094	0.107
MARRIED	2.636	2.851	-0.229**	0.117
EDUCAT	-0.513**	0.237	0.026*	0.014
HHSIZE	-0.746**	0.351	-0.005	0.017
LANDSIZE	-2.316**	1.023	0.014***	0.025
TLU	-0.019	0.162	0.000	0.005
ASSET ^b	2.670	1.875	0.193	0.075
TOTINC ^b	-0.428	2.065	-0.001	0.085
EXTENSION	0.176	1.078	0.086**	0.041
MARKET	-11.218	10.024	0.197**	0.100
CREDIT	0.848	1.409	0.149	0.105
TRAINING	-15.385**	7.420	0.376***	0.121
IRRIGAT	-0.897	4.068	0.127*	0.071
EMPLOYED	3.542	3.557	0.013	0.185
BUSINESS	-4.064	3.583	0.356**	0.161
EXTDIST	0.035	0.054	-0.003***	0.001
ATTITUDE	-4.484	3.675	0.040**	0.019
UMZINYAT	-35.249	25.468	1.197***	0.286
UTHUKELA	-23.243	16.896	0.765***	0.298
CONSTANT	28.072**	16.423	-3.710	1.092

Wald χ^2 83.73***

N 513

Vuong Test (z=5.10, p=0.000)

Test of instruments validity ($\chi^2=21.64$, p=0.000)

Notes: ***, **, and * means significant at 1%, 5%, and 10% levels, respectively. ^brefers to logged values

The Poisson model indicates that the being married was associated with decreasing expected log count of group membership. This is because married farmers have different time allocation preferences than the unmarried. Married individuals face higher opportunity costs than the unmarried ones because the married have additional family responsibilities and household duties. This is in line with studies such as Bauernschuster et al. (2010), who found that married individuals have a higher time preference for family than for other activities. The results also show that for each year increase of education, the expected log count of group membership increased by 0.026. The more educated farmers understand and interpret information better, resulting in them facing less transaction costs when joining groups and benefiting more from the group memberships. The more educated are in a position of independently analysing and learning about how the groups work, and how they can benefit from participating in these groups. As explained in Ostrom (2000), learning the game tends to lead to more cooperation, not less.

An additional hectare of land was associated with increasing membership in groups. Owners of bigger farms have more incentives to increase their social capital because bigger farms signify increased agricultural production potential. Since membership costs are usually fixed, farmers who produce more are likely to benefit more from the groups. The positive estimated coefficient on extension is because of the fact that contact with extension is an important source of information about the benefits of being group

members, how to join these groups, etc., among rural households. In South Africa, the extension officers have been in the forefront of promoting group formations and participation by farmers in diverse groupings as part of the government's strategy. The government prefers to help farmers when they are members of groups. This explains the negative coefficient on the distance to the nearest extension office, as those far from the extension offices are less likely to access information. Similarly, access to the market place also speaks of ease of access to information.

The positive estimated coefficients of irrigation and ownership of micro-businesses is because these complementary assets enhance successful cooperation. Gains from participation in groups are larger if a farmer irrigates because irrigation farming results in increased yields. Also, owners of businesses join more groups as increased social capital helps them in their farming as well as business activities. The increased risks of businesses failure and the lack of formal insurance mechanisms against unexpected shocks in the rural areas is such that business owners depend on social capital in case of business failure. As expected, those farmers with an inherently positive view of the merits of groups were more likely to join many groups. The results also show location effects, showing higher expected log of counts for both Umzinyathi and Uthukela districts than the Harry Gwala district.

Impact of Social Capital on Entrepreneurship: The IV probit model was estimated to investigate the impact of social

capital on entrepreneurship and the results are presented in Table 4. The model was significant at the 1 per cent significance level, implying that it fits the data relatively well. The Wald test of the exogeneity of group memberships was significant, indicating that group memberships is endogenous. This suggests that the results would have been biased without correcting for the endogeneity of group memberships. This implies that the use of the IV approach is justified, as it corrects this endogeneity problem.

The results indicate that joining an additional group membership increases the chances of being an entrepreneur by 11 per cent. This result is in line with literature (e.g., Michelacci

and Silva 2007; Mair and Marti 2009; Bauernschuster et al. 2010; Díaz-Pichardo et al. 2012). The explanation is that, the lack of formal information, credit and insurance institutions in the rural areas means that participating in groups provides an informal way for the smallholder farmers to access information, credit and insurance. Discussions with the farmers indicated that most of these groups render a number of services to their members that are important for entrepreneurship, such as dissemination of price or market information, input access, output market access, credit and savings, trainings and information/ experience sharing.

Table 4: Impact of Social Capital on Entrepreneurship, IV Probit Model Results

Variables	Coefficients		Marginal effects	
	Value	Std err	Value	Std. err
GROUPNO _c	0.340***	0.097	0.106***	0.029
AGE	-0.083***	0.022	-0.015***	0.004
GENDER	-0.684**	0.295	-0.126**	0.053
MARRIED	-0.474	0.379	-0.087	0.069
EDUCAT	0.231***	0.068	0.043***	0.012
HHSIZE	-0.064*	0.034	-0.012*	0.006
LANDSIZE	0.128	0.131	0.024	0.024
TLU	0.034	0.021	0.006	0.004
ASSET _b	-0.253	0.156	-0.047	0.029
TOTINC _b	-0.104	0.195	-0.019	0.036
EXTENSION	-0.082	0.231	-0.015	0.043
MARKET	1.223***	0.303	0.226***	0.053
CREDIT	-0.158	0.243	-0.029	0.045
TRAINING	2.392**	1.063	0.441**	0.193
FARMEXP	-0.007	0.008	-0.001	0.002
IRRIGAT	1.477***	0.356	0.272***	0.061
EMPLOYED	0.076	0.304	0.014	0.056
BUSINESS	-0.120	1.031	-0.022	0.190

(Contd.....)

Table 4 (Contd.....)

UMZINYAT	-0.151	0.237	-0.047	0.074
UTHUKEL	0.105	0.161	0.033	0.050
_CONSTANT	2.082	2.205		
/athrho	1.799***	0.535		
/Insigma	-0.355***	0.031		
rho	0.947	0.055		
sigma	0.701	0.022		

Wald χ^2 755.82***

Pseudo R2 0.20

N 513

Wald test of exogeneity ($\text{/athrho} = 0$): $\chi^2(1) = 11.32, p = 0.0008$ Notes:***, **, and * means significant at 1%, 5%, and 10% levels, respectively. ^brefers to logged values, and c is the predicted value of GROUPNO.

The results also show that increasing age was associated with decreasing chances of being an entrepreneur. This result, which is consistent with literature (e.g., Man et al. 2008; Rudmann 2008; McElwee and Bosworth 2010), implies that younger farmers are more entrepreneurial compared to older farmers. A plausible explanation is that older farmers are less ambitious, rigid and generally less open to new ideas than younger farmers. Entrepreneurs tend to become less entrepreneurial with age, with the older individuals becoming less growth oriented and investing less on new ventures. Contrary to conventional theory and literature (e.g., Bauernschuster et al. 2010), Table 4 shows that females were more entrepreneurial than males. The expectation was that men would be more entrepreneurial as they usually have access to more resources than women, which should enhance their entrepreneurship development (Mallick and Rafi 2010). A possible explanation of this result is that, since the focus of this study is

on entrepreneurship in farming, women make more efforts to try and make smallholder farming work for them as they do not have many alternatives outside farming compared to men. This is in line with sentiments by studies such as Grant (2013), who noted that the range of women's choices is very narrow in terms of sectoral participation in South Africa. Their counterparts, on the other hand, have more opportunities outside farming, resulting in less commitment and limited entrepreneurship in farming activities.

As expected, and in line with Bauernschuster et al. (2010), increasing education was associated with increasing chances of entrepreneurship. This is because increased education reduces information costs as it enhances access to and better interpretation of information. Moreover, the educated farmers are more confident, and are able to negotiate better in the market. The results also indicate that

increasing household size was associated with decreasing chances of being an entrepreneur. An additional household member reduces the probability of being an entrepreneur by 1.2 per cent. This result suggests that the consumption needs of bigger households dominate their labour supply. As a result, farmers with bigger families have to focus more on producing to feed their families. The bigger families are less likely to produce a surplus, and thus, are less likely to be entrepreneurial compared to smaller families.

The results show that better access to markets enhances entrepreneurship development. Access to the market implies less search and information costs, and speaks of better opportunities of making profits out of farming activities. Farmers are incentivised to be more entrepreneurial in their farming activities when they feel the prospects of success are high. The results also indicate that irrigation is positively related to entrepreneurship in farming. This is because irrigation farming is associated with lower risks of crop failure as well as higher yields. Access to training was positively related with entrepreneurship, since relevant training improves farmers' entrepreneurship skills. While most of the farmers in the rural areas depend on trial-and-error, this result implies that entrepreneurship can be improved by providing relevant training. This is in line with de Wolf and Schoorlemmer (2007), Man et al. (2008) and Man et al. (2002).

Conclusions and Policy Implications

In rural areas, which are characterised by lack of formal institutional arrangements for

information, credit and insurance supply, social networks can assist entrepreneurial farmers to overcome resource constraints and provide an informal way to access information, insurance and credit support. This paper investigated the role of social capital on entrepreneurship among smallholder farmers in the KwaZulu-Natal province of South Africa. The empirical results indicated that social capital plays a positive role in enhancing entrepreneurship among smallholder farmers. An additional membership to a social group or association was associated with an increase of 11 per cent in the likelihood of being an entrepreneur. This result indicates that social networks and personal contacts are key in rural areas, as they help the smallholder farmers overcome resource constraints and institutional inadequacies that characterise their communities. The study findings suggest that encouraging smallholder farmers to form, join and participate in groups or associations can play a positive role in improving their entrepreneurship. These groups could be farmer or externally initiated, could be agricultural or non-agricultural. The groups and informal networks should be strengthened through training and information support so that they continue to disseminate accurate information. The benefits of participating in the groups should be explained and further trainings on how these groups can work should be done to the farmers, especially to those with an inherent dislike or distrust for groups.

The study findings also suggest that focused trainings and policies that increase the

farmer's complementary assets (e.g., non-farm businesses, irrigation, land, etc.) would improve entrepreneurship among smallholder farmers. In particular, women, who are usually excluded in interventions, should be targeted as they were found to be more entrepreneurial than their male counterparts. The youth should also be prioritised for greater success. However, given that the

youth generally prefer sectors other than farming, there is need for strategies that stimulate interest in farming among the younger generations. Also, the results suggest that promoting family planning to maintain small households and merging land to increase farm sizes may improve entrepreneurship among smallholder farmers.

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