Smallholder funding schemes and farm productivity in rural Makonde District, Mashonaland west, Zimbabwe

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Received: 31 August 2024| Accepted: 2 October 2024| Published: 31 October 2024

Abstract

The paper investigated the impact of small holder financing model on farm productivity in the context of the ever-increasing funding gap in agriculture. The research was anchored on social capital theory and the Keynesian economics. The study adopted a post positivism philosophical orientation in addressing the seemingly increasing funding gap. Data was collected from 150 small holder farmers dotted around Makonde district of Mashonaland west using stratified sampling technique. The sample size was 200 as guided by the Yamane formula. The paper utilised structural equation modelling using SPSS extension module AMOS (analysis of moment structures). The structured questionnaire used to collect data comprised of close ended items and was validated using discriminant validity as well as convergent validity. The results showed that the mostly used funding model was bank credit in the form of micro credit loans, rotating savings credit association among others, while contract farming and multilateral donor schemes were rarely used. Smart joint venture schemes were least used. Results show that joint venture schemes were positive related to farm productive and goes beyond funding to impart key skills to farmers. Bank credit scheme was found to be negatively related with farm performance. This was attributed to high transaction costs in lending institutions. Government funding was found to be inefficient. It was recommended that to address the small holder funding gap, resources should be channelled through the agriculture value chain, through agribusiness as these were better placed understand the needs of farmers. Government should only provide conduce operating environment for strategic partnership and joint venture schemes to flourish.

Key words: Smallholder farmer, Funding gap, Financing schemes, Productivity

Introduction

Smallholders are finding it difficult to fund their farming ventures despite the value they bring to the national economy (Scoones, 2017). They have limited access to both lucrative markets and formal financial markets due to their perceived high-risk tag. This has led to their underperformance despite their huge potential. Their contribution to the national economy nose-dived since the turn of the new millennium. This is against the backdrop of several government initiatives and other multilateral institutions to address the well pronounced funding gap among the small holder farmers. Development aid institutions (Multilateral) on the other hand supports small holder farmers as they are driven by fighting poverty among the poor, thus leaving out large scale commercial farmers. Regionally, the Africa growth rate in agricultural production is not impressive as it is just above 2% despite the continent being

richly endowed with millions and millions of arable land (Chigumira, 2018). Other economies are however showing promising trends such as Ghana, Angola, Benin and Malawi all with annual growth rates of above 2%, with the likes of Burkina Faso, Sudan, Mozambique, Guinea, and Ethiopia just above 1% (Broka, 2016). Funding is very low relying predominantly on donor funds and government. Sub-Saharan Africa witnessed a 0.6% annual growth rate over the past two decades, with some countries witnessing negative growth rate. An example is Zimbabwe which fell from being the bread basket of the sub-Sahara to a basket case since the turn of the millennium (Obioma & Okonko, 2017). Agriculture contributes immensely to the economy of Zimbabwe directly and indirectly as earlier on alluded to. Despite the high level of employment in the sector, it directly contributes 15-19 percent to annual GDP, depending on the rainfall pattern (Government of Zimbabwe, 2022), and this is a statistic that underscores the true importance and dominance of the agricultural industry. It is generally accepted that when agriculture performs poorly, the rest of the economy suffers (Kadenge, 2016). Thus, agricultural production provides the much-needed bedrock upon which a sustainable development would blossom. Being the main source of food for most of the population, agricultural production remains the mainstay of the Zimbabwean economy.

Theoretical Review

The Organization of Rural Finance, in general, and in particular, agricultural finance is strongly conditioned by the issue that inputs are transformed in outputs with considerable time lag and that production and sale results can be highly volatile, thus resulting in high risk of financing such ventures. In understanding agricultural finance three theories are considered, that is asymmetrical information theory, social capital theory and the extended growth theory (Saquib, 2018; Abedifar, Molynuex & Tarazi, 2018).

Social Capital Theory

The social capital theory was propounded by Bourdieu (1985) and popularised by Coleman (1990) and is grounded on social interactions. The social capital therefore refers to financial resources that accrue to individuals through their interactions in social networks or alternatively the value that accrues to individual members as a result of connectedness and trust between people (Bongomin, Munene, Mpeera, Akol; 2017). The theory also known as the theory of connectedness and mutual trust is grounded on socialistic views that an individual member is part of the community in which he hailed from, and his behaviour and riches are shaped by the community. The theory recognises two forms of social capital, that is, bonding social capital and bridging social capital. Bonding social capital as posited by Coleman (1988) arise as a result of connections formed by homogeneous group such as farmers or teachers and such groups will be having similar needs and bridging social capital arise when social connections cut across different groups for the purposes of raising capital this link say other players in the value chain for example to farmers. Social networks play a critical role in financing operations and the relationships are based on trust (Guiso, Sapienza & Zingale, 2016). Social networks are a valuable source of financial capital given technological advancement such as internet and social media which has allowed social media to form global business networks and connections as noted by which expand the scope of credit. Success of companies like Airbus and Uber can be traced from social capital theory as their market share became a major disrupting force (Bongmin et al, 2017).

Small holder farmers mainly rely on banks loans, microfinance loans, strategic partnership schemes as well as aid from multilateral donor organisations (Mbizi et al., 2021). The

predominant funding source is microfinance loans which has been found to be costly and given the declining global prices of agricultural outputs, this has weighed in heavily on the operations of small holder farmers in rural Zimbabwe. Financial institutions are by nature in the business of intermediating between areas of surplus of funds (lenders) and areas of deficit (borrowing). Bank credit thus form the main traditional source of finance for agriculture as they are better resourced through harnessing resources in economies towards productive use (Azadi et al., 2022; Hadelan et al., 2022 & Park et al. 2022). Traditionally bank credit has played a critical role in financing productive sectors of all economies and several studies have shown its continued dominance in transforming both rural and urban farming. However, the main stumbling block in realizing full potential is the corresponding requirement by banks of quality collateral to cushion themselves against adverse movement in output by farmers given high perceived risks in agricultural ventures (Mulongo, 2017; Panezai & Ali, 2017; Giller et al., 2021). Effect of bank credit on performance of agriculture has been documented by a number of scholars with varied findings, divergent findings has been obtained in different economies. Bhuyan (2017), after undertaking a study on the role and adequacy of bank credit in sectorial productivity in which he used ordinary least squares (OLS) to determine the relationship between bank credit and agricultural productivity where he established a strong relationship with 30% increase in agricultural productivity attributable to increase in credit to agriculture in India. This shows a strong relationship between the two. Similarly, Kambali and Panakanje (2022) by looking at credit access and impacts on smallholder through undertaking a meta-analysis on available literature and established that credit access indeed, help boost small holder farmers productivity. This source of financed has been credited by most scholars for its ability to transform peasant farmers into commercially viable entities. Government has a duty to feed its nation and can take an active role in financing agriculture given its massive financial muscles. This has proved to be the main financing modality particularly in the developed world (Oberholster & Adendorff, 2018). Government`s concessionary interests by nature help by reducing operational expenses farmers incur and resultantly lead to improved performance in financial terms which if accompanied by ploughing back of profits normally results in improved productivity (Park et al., 20222; Moh'd et al., 2017; Motsoari et al., 2015; Obrimah et al., 2014). Okoye (2017), after studying the agricultural value chain financing for small scale farmers in Nigeria discovered that government credit (concessionary loans) contributed to a larger extend in growth of Nigerian small holder farmer and their ultimate transition from peasantry to commercial farming as evidenced by a strong positive relationship between government loans and performance of small holder farmers after testing of the relationship at 5% confidence interval. Similarly (Hlupo, 2018) undertook a critical analysis of sustainable rural finance for agriculture find out that government support is key in transforming peasant farmers and smallholder farmers as supported by how the Mkokha village was uplifted through government financial support as their disposable income was seen improved by more than 10% as smallholder farmers managed to restock their farms, however she noted how government subsidized credit has transformed agriculture in countries like Brazil, China as well as Australia.

Contract farming and joint venture schemes have shaped the funding landscape and agricultural productivity across all farming types. Contract farming is a restructured strategic partnership which form a part of more complex inclusive business (IB) set up which by design is meant to benefit both the farmer and the agribusiness, it's a win-win arrangement where the farmer is given inputs as well as expertise and, in return, promises to deliver the agreed crop to the agribusiness which then recover its advanced finances in form of inputs and the farmer is given the balance of delivered crops (Baqutayan, Mohamad, Azman, & Abuhassan, 2017; Herrmann, 2017). Several scholars have credited the financing model with its ability to provide inputs at

market rates, transfer of technology as well helping farmers by reducing price risk as the product in question`s price may be prefixed on consummation of the contract (Dube & Mugwagwa, 2017). A cross-sectional survey in west Africa which empirically examined contract farming on cocoa farmers by Nelson and Phillips (2018) established an improved productivity among cocoa farmers who were contract farmers as compared to those who were not, in addition they also find out that most farmers on contract farming had better technical skills which they indicated had acquired through the contractual relationships over and above the acquisition of modern equipment in cocoa farming and value addition there off. This was particularly felt among large scale farmers who through economies of scale managed to increase significantly their output with a 10% success rate over smallholder farmers. Similarly, Duesberg, Bogue and Renwick, (2017) in their study in the European union block using logistic regression analysis of collected data for member countries pertaining to farmer perceptions as well as impact of contract farming on livelihoods of commercial farmers and peasant farmers established a positive relationship between adoption of contract farming and productivity of farms. They however discovered that with growth of agribusiness (business enterprises) supporting contracted farmers they end up crowding out small players using their financial muscles thus leading to monopsony (single buyer of agriculture output by the one agribusiness enjoying monopoly power) resulting in exploitation of farmers as the monopsony will end up prefixing prices lucrative to only the monopsony, thus this funding model need proper regulatory authorities for balances and checks.

Smart partnership schemes are a win-win funding strategy where one party brings what the other party does not have and, in return, agree on either sharing profits or output based on individual contributions, they arose directly to help address problems of exploitation of contract farming where one party may have a dominant position over the other. These models are viewed as inclusive business models in agriculture as they aim to include the poor people into the value chain as consumers, producers and or employees (Gonzalo & Kantis, 2017; Larder et al., 2018). Worldwide, there has been a reinvigorated interest in inclusive business models in farming as a part of wider debate on growing farming investments in lower income countries. These can come in form of joint venture scheme or share cropping (James & Woodhouse, 2017). As defined by James and woodhouse (2017) joint venture is a pact in which two or more parties agree to combine resource to undertake a business venture for example in farming a financier may bring financial resources while the farmer provide land. This has been used as an innovative financing model by farmers as some agribusiness may have money to invest in agriculture but may not have land to farm while on the other hand the farmer may have land but lacking financial resources thus by teaming up their economic endeavours can be accomplished. Lahiff, Davis and Manenzhe (2012) after undertaking a study on joint venture drawing lessons from land reform program in south Africa established that black poor farmers in the Limpopo region managed to transform themselves into viable farmers and boosted their productivity through their participation in joint venture schemes with rich white community which did not only avail financial resources to them but however led to successful transfer of technology and skills to run farms. This win-win inclusive business model has not only aided poor farmers to commercialize their operations but also made them employers in their own right. Cramb and Ferraro (2012) undertook a study in Malaysia on appraising alternative financing models for large scale commercial farming. A survey on effective financial models on an oil palm plantation Sawat on three different joint venture arrangements, renting and (for comparison) a private plantation over state land and undertook a benefit cost analysis on the model, in both cases there was a trade-off between the efficiency and equity outcomes of the alternatives as modelled though joint venture scheme provided higher aggregate net benefits. The results support earlier reviewed literature as both show positive benefits arising from

adoption of joint venture schemes across all types of farming but with more inclination towards large scale commercial farming. In support of the joint venture scheme on productivity and commercialization (Woodend, 2003) after studying Zimbabwe`s smallholder commercial potential through contract farming and other strategic partnership schemes discovered that although the arrangements were not formalized in the eastern region in production of tea and bananas due to fears of offer letter withdrawal (most of the partners were the former colonial masters), members of joint ventures reported a more than 10% point variance with their counter parts who were farming on their own with help even from agribusiness entities.

Research Methodology

The study was conducted in Makonde district of Mashonaland west targeting small holder commercial farmers. These were into crop production, animal husbandry, plantation, fish farming as well as market gardening. A post positivism philosophical orientation guided this research study. The paper adopted a cross-sectional survey research design to allow the researcher to collect data from different types of small holder farmers at the same time and make applicable inferences. The research utilized a structured questionnaire with close ended items to collect data from 150 smallholders farmers scattered in Makonde district of Mashonaland west in Zimbabwe. The data were analysed using covariance based structural equation modelling (SEM) to establish the impacts of different funding sources of farm productivity. The model allowed the researcher to measure latent variables and indirect effects. Validity of the results was tested using both discriminant and convergence validity while reliability was tested using both Cronbach alpha and construct validity. This process was important as the researcher was part of the research process in item selection and sampling units' selection.

Results and Discussion

The paper sought to characterize financing models used by smallholder farmers and evaluate the effect of each model to farm productivity. The validity and reliability results are presented in table 1 below/

Table 1: Construct, Items and Factor loadings, Cronbach alpha, composite reliability & AVEs

Construct/Variable	Items	Factor Loadings	Cronbach alpha	Composite reliability	Average variance extracted
Joint venture Schemes (JVS)	JVS1	.722			
	JVS2	.782			
	JVS3	.672	.915	.824	0.623
Contract Farming Schemes (CFS)	CFS1	.684			
	CFS2	.696			
	CFS3	.711	.886	.765	.546
Bank Credit Schemes (BCS)	BCS1	.648			
	BCS2	.768			
	BCS3	.689			

	BCS4	.685	.974	.825	.643
Multilateral Donor Schemes (MDS)	MDS1	.752			
	MDS2	.697			
	MDS3	.765	.843	.742	.639
Farm Performance (PEF)	PEF1	.840			
	PEF2	.713			
	PEF3	.776			
	PEF4	.785	.838	.765	.698

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 10 iterations.
Based on Eigenvalues > 1
Total variance explained = 72.645%
Small Coefficients of less than 0.4 were suppressed
Source: Survey data (2024)

72.645% of the variation was fully explained, and rotation converged in 10 iterations, as Table 1 demonstrates. The reported total variation exceeded the permitted minimum of 60%, as stated by Platin and Ergun (2017). The components that were taken out from the rotating component matrix solution included joint venture schemes (JVS), bank credit schemes (BCS), contract farming schemes (CFS) and multilateral donor scheme (MDS).

Convergent Validity

Convergent validity, according to Shrestha (2021), is a tool used to assess the degree of coherence between several indicators of the same construct. In order to ascertain convergent validity, it is necessary to compute the factor loading of the items, composite reliability (CR), and average variance extracted (AVE) (Hair, et al, 2014, in Shrestha, 2021). A greater value denotes a higher reliability level. The values of AVE and CR range from 0 to 1. The average variance extracted for the constructs ranges from0.546 to 0.698 which shows that the condition of construct validity was met. AVE Should be greater than 0.5 to confirm that the convergent validity holds as is the case this data as presented in table 1 where the AVEs ranged from 0.546 to 0.698. This confirms that convergent validity was met. Reliability is also assessed through the Cronbach alpha which ideally should be greater than 0.7 and a look at the values for all construct showed that they were all above 0.8 implying that the condition was met.

Franke and Sarstedt (2019) defined convergent validity as a measure's ability to correlate well with various approaches used to assess the same concept. An empirically novel construct's discriminant validity proved that it includes phenomena that other constructs in the model do not. (Henseler, Ringle & Sarstedt 2015; Franke & Sarstedt, 2019). Convergent validity was the requirement that causative indicators from a measurement model adequately explain the change in the hidden variable that they are meant to measure (Wang, French, and Clay; 2015).

Descriptive statistics on funding models used by small holder farmers

The research sought to characterize the usage of financing schemes by small holder farmers in Makonde district. This was achieved by using measures of location and dispersion. Table 2 below summarises the results.

Table 2: Descriptive statistics

Variable	Min	max	Mean	Mean response	Standard deviation
Joint venture Schemes (JVS)	1	3	1.245	Not used at all	0.738
Contract farming schemes (CFS)	1	3	1.626	Rarely used	0.442
Bank credit schemes (BCS)	1	3	2.613	Mostly used	0.211
Multilateral donor schemes (MDS)	1	3	2.342	Rarely used	0.852

Joint venture schemes had a mean response of 1.25, which corresponds with not used at all implying small holder farmers were not using this funding model. However, the huge standard deviation of 0.738 imply that the respondents held varied views with some mostly using the funding model while some were using the model at all as confirmed by the minimum and maximum values of 1 and 3, respectively. Contract farming and multilateral donor schemes with mean response of 1.626 and 2.342 respectively corresponds with rarely used mean response. However, non-zero standard deviations imply that respondents held varied view. Bank credit schemes were mostly used as indicated by a mean score of 2.6 which corresponds to mostly used.

Model Fit results and hypotheses results

It is pertinent to assess the fitness of a generated model by SEM and this is done using a number of indices. The model fit must meet criteria for results or estimates to be robust. Several metrics for measuring model fit were considered, including CMIN/DF (2/Df), Goodness of Fit Index (GFI), Adjusted GFI (AGFI), Normed Fit Index (NFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). The evaluation model determined that the model fit metrics (2/Df=2.105, GFI=0.934 CFI= 0.946, RMSEA = 0.038, TLI= 0.906, and AGFI=0.921 were acceptable. This can be seen in the table 3 below.

Table 3: Model Fit summary

Fit indices	Original model	Modified Model	Commended	Sources
$\chi 2/DF$	2.765	2.105	≤3.00	
GFI	0.752	0.934	>0.900	Reisinger and
AGFI	0.893	0.921	>0.900	Mavondo (2007),
NFI	0.898	0.928	>0.900	Hooper et al. (2008)
TLI	0.885	0.906	>0.900	Hair et al. (2010)

CFI	0.913	0.946	>0.900
RMSEA	0.054	0.038	<

Source: Researcher (extracted form AMOS output)

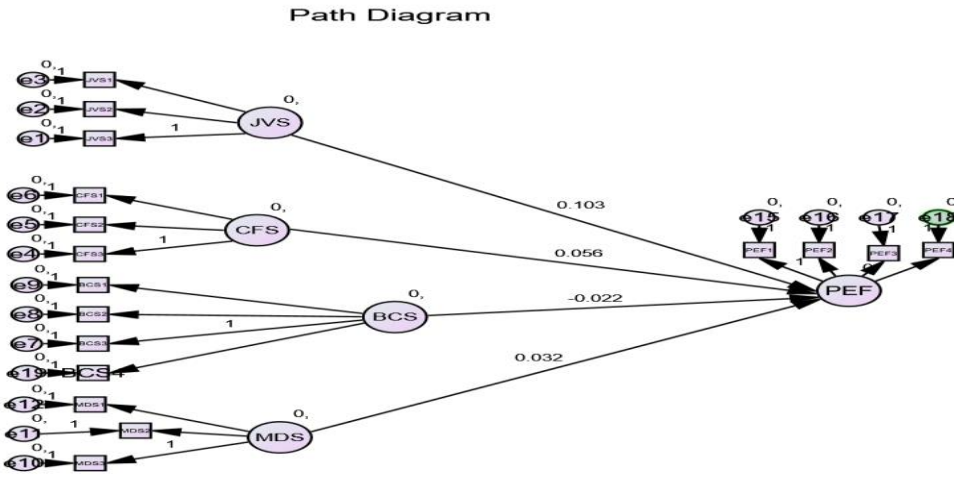
CMIN/DF 3.4 results show an excellent model match as shown by Table 3 above (Zadow, Hunter, Rosenberg, Wood, Houghton, 2017). Makanyeza & Chikazhe (2017) assert that for 2/DF to be approved, it must be less than 3. For a model to be considered acceptable, its RMSEA must be less than 0.07, while its GFI, AGFI, NFI, TLI, and CFI must all be near to 1. (Soares, Monteiro, & Rua, 2017). As the model was seen to be fit, the next stage was to test the research hypotheses. This was tested using structural equation modelling and the results can be summarized by Table 4 below.

Table 4: Results of Hypotheses testing (H_1 to H_4)

Hypothesis	**Hypothesised Relationship**	**SRW**	**CR**	**Remark**
H_1	JVS→ PEF	0.103	7.772***	**Supported**
H_2	CFS→PEF	0.056	2.125***	**Supported**
H_3	BCS→PEF	-0.022	-1.281***	**Supported**
H_4	MDS→PEF	0.032	1.525***	**Supported**

*Notes: SRW standardised regression weight, CR critical ratio, *** significant at p < 0.001.*

The results showed that joint venture schemes had a standardized regression weight of 0.103 which implied that there was a positive relationship between JVS and farm performance as a unit increase in use of the model led to a 0.1unit increase in farm performance. Contract farming and multilateral donor schemes had 0.056 and 0.032 respectively implying that there was a very weak positive relationship between the funding models and farm productivity. However, a standardized regression weight of -0.022 on bank credit scheme implies that there was a negative relationship between the funding model and farm productivity. Micro finance loans as well as bank loans attracted very high interests thus resulting in the negative relationship. Path diagram below presents the results.



The findings concurred with those by Lambrecht & Ragasa (2018), Enimu, Eyo, and Ajah (2017) whose findings showed that joint venture schemes, contract schemes due to their adoption of the business system and the support of a fully functional business ecosystem boosted productivity for all players, farmers included. The rates offered are realistic, they do not burden the farmer while at the same time are viable allowing value chain financiers a meaningful return. Thus, in this way confirming the established relationship. Farmers who used credit particularly micro finance loan were seen making huge losses and being unable to grow their operations. The results contradict Răduțu and Pop (2018), Adjognon et al. (2017), Oberholster and Adendorff (2018) and Wakaria (2016), whose findings show a positive relationship between bank credit and commercial agriculture productivity, as farmers in their respective studies reported improved productivity, though with varying degrees (positive relationship). Donor funding, aid from the World Bank as well as IMF use leads to improved productivity. The findings supported Jenik, Lyman, and Nava, (2017), Motsoari et al. (2015) and Suharto and Iqbal Fasa, (2017) that multilateral financial support from development-oriented institution improve farm productivity, though its effect is weak. Similarly, findings from Uronu and Ndiege (2018) concurred with the research findings as it was pointed that international organisations such as IFAD are mainly concerned with eradicating hunger and poverty among the poor with limited scope on commercialisation.

Conclusion and Recommendations

The paper concluded that joint venture schemes were the master stroke in addressing small holder farmers funding gap as the scheme not only addressed the funding gap, but also assisted with technology transfer and critical skills. Bank lending was becoming costly due to too many formalities involved and this explained the negative relationship with farm productivity. Government should channel agricultural financing through the agriculture value chain to maximize farm productivity rather than involving itself in the actual funding of agriculture.

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