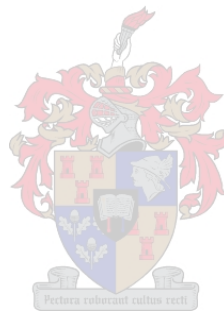


Assessing Farmer Perceptions about The Available Financing Mechanisms and Financial Services – The Case of the Seed Potato Industry in South Africa

by

Jaimé Manuel

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Supervisor: Professor N. Vink

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Declaration

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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Abstract

Farmers lack the opportunities to increase levels of production and improve efficiency for a number of reasons. The lack of a fully functioning financial services market is often identified as a primary constraint in this context. Owing to a supply-led market, financial services in rural areas are both inadequate and costly. Recent policy developments in South Africa note the strategic importance of intensive agriculture in creating employment and stimulating rural economic activity. However, unlocking the potential of the agricultural sector requires an investigation into alternative financing arrangements for agribusinesses.

Potatoes form part of the major staple food groups and are a more efficient producer of calories per hectare farmed than both rice and wheat. In South Africa, potatoes account for more than 50% of the value of all vegetable sales at fresh produce markets; the industry is considered to be one of high export potential and strategic in terms of food security. This thesis uses the seed potato industry as a case study to investigate the demand-side perceptions of the available financing mechanisms and financial services. The seed potato industry is highly concentrated, thus it was appropriate to use a convenience sample to conduct interviews and request questionnaire responses. The result was a rich database, representative of approximately 40% of the seed potato industry in terms of production area. However, the limited number of responses offers little in the way of statistical inference.

The investigation develops an understanding of the current financial services environment in the industry. Access to financial services is identified as a major hindrance to new entrants while unique financing mechanisms are used to limit reliance on Financial Service Providers (FSPs). The findings indicate that contract enforcement is not necessarily important to agricultural businesses as transactions tend to consider a long-term view and are often concluded without traditional intermediaries. Further, financial advisory services like tax planning and management are important considerations for these farmers but are inadequately provided to the case study group. These findings could be used as a basis for future work in the design of alternative financial services and products for farmers.

Opsomming

Landbouprodusente ondervind 'n gebrek aan geleenthede om produksievlakke te verhoog en doeltreffendheid te verbeter as gevolg van 'n aantal redes. Die gebrek aan effektiewe finansiële dienste mark wat doeltreffend funksioneer word dikwels geïdentifiseer as 'n primêre beperking in hierdie konteks; finansiële dienste in landelike gebiede beide onvoldoende en nie bekostigbaar nie. Onlangse ontwikkelinge in beleid in Suid-Afrika beklemtoon wel die strategiese belangrikheid van intensiewe landbou in werkskepping en die stimulering van landelike ekonomiese aktiwiteit. Die ontsluiting van die potensiaal van die landbousektor vereis egter 'n ondersoek na alternatiewe finansieringsopsies vir agribesighede.

Aartappels vorm deel van die vernaamste stapelvoedselgroepe en is 'n meer doeltreffende produsent van kalorieë per hektaar geboer as beide rys en koring. In Suid-Afrika neem aartappels meer as 50% van die waarde van alle groente verkope op varsproduktemarkte in beslag; die bedryf word beskou as een wat hoë uitvoerpotensiaal het. Hierdie tesis gebruik die saadaartappelbedryf as 'n gevallestudie om die persepsies van die beskikbare finansieringsmeganismes en finansiële dienste te ondersoek vanuit 'n vraag-perspektief. Die saadaartappelbedryf is hoogs gekonsentreerd, dus was dit geskik om 'n gerieflikheidssteekproef te gebruik om onderhoude te voer en antwoorde op vrae te versoen. Die gevolg was 'n ryk databasis, verteenwoordigend van ongeveer 40% van die saadaartappelbedryf in terme van produksie-area. Die beperkte aantal terugvoere bied egter min sover dit statistiese inferensie aangaan.

Die ondersoek ontwikkel 'n begrip van die huidige finansiële dienste omgewing in die bedryf. Ons het opgemerk dat toegang tot finansiële dienste 'n groot hindernis is vir nuwe toetreders, terwyl unieke finansieringsmeganismes gebruik word om afhanklikheid van Finansiële Dienste Verskaffers (FDV's) te beperk. Ons het gevind dat kontrakbeding nie belangrik is vir landboubesighede nie aangesien transaksies geneig is om 'n langtermyn-siening te neem en dikwels gebaseer word op lojaliteit eerder as die mees gunstige terme beskikbaar in die mark. Ons het gevind dat finansiële adviesdienste soos belastingbeplanning en bestuur belangrike oorwegings vir hierdie produsente is maar dat die gevallestudie groep nie voldoende ondersteuning of leiding ten opsigte hiervan ontvang nie. Hierdie bevindinge kan gebruik word as 'n basis vir toekomstige werk in die ontwerp van alternatiewe finansiële dienste en produkte vir produsente.

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CHAPTER 1: INTRODUCTION

Farmers in emerging economies, both commercial and subsistence, lack opportunities to increase the levels of production (Jama and Pizzaro, 2008; Bryceson, 2002; and Niehof, 2004). These farmers are exposed to many constraints, including: the productive potential of land, access to water and irrigation, the slow adoption of available technologies, access to markets, extension services and access to credit markets (Jama and Pizzaro, 2008 and Graeub et al. 2015).

In the South African context, the Strauss Commission Report (1996) found that financial services, which include: transmission services; savings products; insurance products; income protection products; financial advisory services; loan products for consumption and production loans in rural areas are both inadequate and costly. This was largely owing to the fact that the financial services market was supply-led. This created a credit gap between rural and urban areas and reducing the credit gap would require a demand driven system of financial services. Many authors who have investigated agricultural credit contracts with a bias towards the lender perspective confirm these findings; the work of these authors will be elaborated on in Chapter 2.

Further, in their analysis of *financial services provision in rural areas of South Africa*, Coetzee and Cross (2002) posited that the presence of commercial banks in rural areas would decline along with their agricultural specific lending portfolios. This would give rise to an increasing role played by the agribusiness sector that favoured larger producers. These facts were confirmed by Piesse et al. (2005) who noted the increasingly important role of cooperatives as commercial financial intermediaries competing with banks for the financial services business of their members.

As part of the South African vision for 2030, the National Development Plan identifies the strategic importance of agriculture and the need to investigate alternative financing arrangements in the agricultural sector. Access to financial resources, endowments and services are important for any business, particularly so for capital-intensive business like farming. For this reason, the authors find it of crucial

importance to focus on the financial market constraint towards developing an understanding of why agricultural/rural credit markets function as they do.

It goes without saying that the presence of asymmetrical information in the realm of credit contracting poses significant challenges in assessing the credit risk of a potential borrower. Overcoming these issues requires both hard and soft data. The former allows for an assessment of repayment ability while the latter considers incentives and motives that may impact a repayment decision, or willingness to repay a debt. The unfortunate issue is that acquiring this data comes at a cost to lenders who wish to screen potential applicants, which ultimately translates negatively into the lenders' profit function. Further, the risk of default results in increased monitoring efforts to ensure repayment. In an attempt to avoid these costs, lenders prefer to engage in risk rationing that results in credit rationed farmers (Boucher et al., 2008).

Food security¹ has become a priority in recent years as trends indicate the likelihood of food shortages with an ever-growing population without the corresponding growth in staple food volumes. The aforementioned issue of risk rationing and the resultant credit rationing of farmers becomes important in this context as farmers will not be able to pursue activities that will increase the supply of staple foods and generate the positive second round effects of increased agricultural production and rural economic activities.

The three major staple foods in order of significance are rice, wheat and potatoes. Of the so-called 'big three', potatoes offer the advantage of a shorter growing season with higher dry matter yields for human consumption. In addition, potatoes are high in nutritional value and are able to convert more calories per hectare using less water than rice and wheat (Scott et al., 2013). In South Africa, the potato industry is a significant part of both vegetable production and consumption and accounts for more than 50% of the value of all vegetable sales at fresh produce markets (Potatoes South Africa, 2016).

¹ According to the FAO (2006), food security encapsulates the availability, access, safety and stability of food sources i.e. food security is achieved when the required quantities are available and accessible in accordance with health and safety standards on a sustainable basis. In this context, food security considers all of these factors with a focus on the available food supply and the positive impact that improved potato production could have on the quantity of food available for consumption.

The Department of Agriculture, Forestry and Fisheries identifies that the South African potato industry has a positive self-sufficiency index i.e. South African farmers produce more than is consumed locally. Accordingly, they identify the export potential of South African potatoes. In particular, they note an increase in the demand of exported potato seed in Sub-Saharan African countries. Self-sufficient production has important connotations for foreign exchange; the fact that the potato industry has the potential to generate foreign exchange through foreign sales implies that the industry is strategically important to the economy. (DAFF, 2015 and SCR,1996).

From the view of increasing potato farmer efficiency and the possibility of exporting additional volumes to neighbouring countries, it is clear that the expansion of the seed potato industry is a potential panacea to stimulating rural economic activity and making a significant contribution to food security. Hence, if previous statements about credit-rationed farmers not being able to pursue their preferred investment strategies holds, the key to unlocking the potential of the seed potato industry and realising the vision of the NDP lies in developing an understanding of, and improving on, the financing mechanisms available to, and used by, seed potato growers.

Therefore the problem statement of this thesis is to develop an understanding of seed potato growers' perceptions about the available financial services offerings and the resulting mechanisms they choose to employ in their respective businesses. We assess the extent of financial market failures to identify possible reasons for farmers not being able to pursue their preferred investment strategies.

1.1. Objectives of this Study

The objective of this study is to investigate farmers' perceptions of the available financing mechanisms and the manner in which farmers choose to use these mechanisms in their businesses. Using the seed potato industry as a case, this dissertation will explore the demand side perceptions around financial services to assess whether the existing arrangements result in credit-rationed farmers who are unable to pursue both productivity enhancing and profit maximising strategies at the farm level.

Bringing all of this together, this study will use qualitative methods to identify if the rural financial market functions effectively, assess if farmers are indeed credit-rationed and identify how financial services and products are employed in farmers' businesses. To explore these issues, this study will:

1. Develop an understanding of the general farmer-borrower characteristics in the study area through socio-economic analysis.
2. Investigate the current environment around farmers' access to credit by considering: the lender-borrower relationship(s) and the presence of credit rationing.
3. Identify the financing mechanisms available to seed potato farmers and the borrowers' perception around these mechanisms.
4. Assess the type of investment decisions farmers would make if they were not credit constrained i.e. would profit maximizing, productivity enhancing investments be pursued?

1.2. Study Hypothesis

The primary objective of this study is to assess if seed potato farmers do not have access to adequate financial services and whether they exhibit similar perceptions about the use of available financing mechanisms. The hypotheses that will be investigated are:

- i. Farm financial performance, investment decisions and risk mitigation strategies indicate that farmers are not good candidates for conventional commercial bank credit.
- ii. Farmers are underserved by traditional Financial Service Providers (FSPs) due to information asymmetries and the resultant high enforcement costs which result in farmers being credit rationed.
- iii. Farmers are unable to pursue productivity enhancing investments.
- iv. The manner in which farmers are credit-rationed affects perspectives around available financing mechanisms.

1.3. Scope and Limitations

Information asymmetries are important in the context of financial services provision, and particularly credit constraints; however, an in-depth analysis of these issues is beyond the scope of this study. Instead the issues of adverse selection and moral hazard present in the credit paradigm are briefly explained in Chapter 2.

The quality and value of collateral is an area of interest as it is used in the banks' assessment of returns when granting credit. The bank requires collateral in the event of default and thus requires the value of collateral to at least be equal to the amount of credit extended. There is a significant body of work that evaluates the value of collateral; some of these principles are touched on in Chapter 2. However, for the most part, the valuation and quality assessments of collateral are beyond the scope of this thesis.

The lender profit function is an important determinant of whether or not a potential borrower will be granted credit. This is the case because we assume that economic agents are rational and profit maximising, thus a lender would not extend credit if it thought the relationship would result in a loss. Further, we assume that any lender profit function is captured through the presence of credit rationing, thus analysis into the lender profit function is beyond the scope of this study.

Although this study may refer to certain policy positions relating to agricultural finance and credit in South Africa, analysis of the effectiveness and efficiency of those policy positions is beyond the scope of this the study. In gathering responses, we were only able to successfully conduct interviews with or received responses from 17 respondents. As a result, despite the richness of the data gathered, the data has limited power of statistical inference.

1.4. Study Outline

The current chapter provided an introduction into the importance of an investigation into financial services provision to farmers and highlighted why the seed potato

industry is a good case study in the South African context. Chapter 2 explores the relevant literature related to agricultural finance, with particular reference given to intermediation theory and credit rationing in the context of financial service provision. Thereafter Chapter 3 provides a detailed explanation of the seed potato industry and describes the methods used in data collection. Chapter 4 shares the empirical results of the study while Chapter 5 explores the implications of the study findings in relation to the existing literature and study hypotheses. Finally, Chapter 6 concludes by providing a synthesis of the previous chapters and suggests ways in which financial services provision to the agricultural sector could be improved.

CHAPTER 2: LITERATURE REVIEW

The following chapter begins by considering the role of external finance towards more productive and profitable farming units. Emphasis is given to pecking-order-theory in relation to external financing needs and what it means to be credit constrained. Thereafter it goes on to investigate the role of banks in terms of intermediation theory and the role financial institutions play in making credit accessible to borrowers.

2.1. What Makes Agricultural Finance Different?

Access to credit and other financial services has been found to be a productivity enhancing and risk-mitigating factor for agricultural businesses (Vandenberg, 2003; Zinych and Odening, 2009). Taking the role of financial services a step further in the agricultural context, one could reasonably deduce that access to financial services, and credit, or a lack thereto is indeed a barrier to entry and a hindrance to success of farming businesses. When compared to other developing regions, it has been found that Sub-Saharan African countries' food crop productivity has remained relatively stagnant since the 1960s (Adesina, 2010).

The reasons for this stagnation are owing to a lack of capital and limited access to participate in markets. Jayne et al. (2010) suggest that capital restrictions result in the limited use of irrigation, low input use, lack of fertilizer use and the slow implementation of new cultivars, while slow market development is attributed to a lack of surplus crops for sale, inequality of productive assets and a lack of adequate transport infrastructure required for the timely delivery of agricultural produce. These findings were confirmed in various studies, including: Lin and Martin (2010), Adesina (2010), Shee and Turvey (2012), Jayne et al. (2004), Hendrikse and Veerman (2001).

Prior to the mid-1990s, largely owing to trade deregulation, there has been a decline in the presence of government-controlled marketing and commodity boards in South Africa. These government agencies provided a single avenue for the sale of a farmer's produce and regulated prices, which allowed farmers to stabilize their incomes. A guaranteed market, with stable prices, improved farmers' creditworthiness

and reduced lender risk. In addition, these agencies provided valuable seasonal finance, often under an arrangement of deferred payment (Cárdenas, 1994; Winter-Nelson and Temu, 2005; Martin and Clapp, 2015).

In South Africa, prior to the mid-1980s, apart from offering price stability, these agencies acted as financial intermediaries by providing subsidized credit to farmers and subsequent debt rollovers backed by government guarantees. This allowed for farmers to access credit at lower rates and to defer repayment in tough economic times. These practices gave farmers a credit-price-advantage where they were able to produce with relative economic ease, albeit inefficiently. Their disbandment resulted in many farmers defaulting on loans and having their farms repossessed and saw commercial banks and cooperatives reducing their lending practices to the agricultural sector (Piesse et al., 2005).

Recent agricultural trends show that there has been a reduction in the rate of new farmers entering the sector and farmer numbers are dwindling, as farmers seek to consolidate their farming businesses in an attempt to benefit from economies of scale (Mishra et al., 2009). Gloy et al. (2005) and Vandenberg (2003) suggest that the positive relationship between farm size and access to credit could be a possible explanation for dwindling farmer numbers and the reduction of new farmers entering the industry.

When compared to other sectors, farming is deemed to be significantly more risky as a financial investment. The additional risk is owing to: a large reliance on rain for consistent and higher yields; the impact of temperature fluctuations on yields; the impact of crop disease on quality that affects the price the farmer receives; volatile commodity prices; a lack of physical collateral and exposure to covariate risks amongst borrowers (Sacerdoti, 2005; Adesina, 2010; Martin and Clapp, 2015; Saqib et al., 2016). In addition, Katchova and Barry (2005) find that the agricultural sector tends to be dominated by a longer-term investment horizon with seasonal debt repayments and significant investments in non-current assets.

The presence of increased risk results in commercial banks being less willing to extend credit to farmers on a long-term, sustainable basis and sees them pursuing short-term investments of a more speculative nature. This mismatch results in rural credit markets being underserved and farmers being inhibited from reaching their true productive potential (Adesina, 2010; Winter-Nelson and Temu, 2005). Besides the mismatch in investment horizon, large investments in non-current assets coupled with declining ratios of loan value to collateral posted since the Global Financial Crisis, imply that farmers are able to borrow even less (Lin and Martin, 2010).

2.2. The Investment Decision

In evaluating possible value-creating investment opportunities, conventional *pecking order theory* suggests that a firm has three available sources of capital to invest in new projects, namely: retained earnings, debt and equity. Using retained earnings is the easiest and cheapest form of finance. However, many firms do not have sufficient levels of retained earnings to fund projects entirely from this source. The use of debt is common and has tax advantages that result in an increase in firm value and the subsequent returns to owners, while sources of equity demand a risk premium i.e. are more expensive than debt. *Pecking order theory* suggests that a firm will issue debt until the point that its debt capacity is exhausted (Myers and Majluf, 1984; Frank and Goyal, 2003; de Jong et al. 2011).

Further, the availability, access and cost of various forms of finance are important determinants of business growth. The information asymmetry issues of screening, incentives and enforcement are more acute for small businesses. Consequently, smaller firms struggle to obtain access to finance, which hinders their ability to increase levels of production or expand operations i.e. a lack of access to external finance may result in entrepreneurs pursuing sub-optimal investment decisions (La Rocca et al., 2011; Wang, 2010).

It is important to understand the dynamics of the lender-borrower relationship and what drives the efficacy of the relationship from the supply-side i.e. why is it that rural financial markets do not operate as intended? We draw on the work of Vandenberg (2003) that suggests the reasons for rural firms being underserved include: a lack of operating industry, lack of collateral and little assurance that the

funds will be used for the intended purposes. In addition, Adams and Graham (1981) identified that farmers' lack of access to a fully functioning financial services market is owing to the significant screening, monitoring, and enforcement costs which lenders are exposed to in the agricultural sector.

In discussions with an agricultural service provider in the study area², these sentiments were confirmed with the service provider stating that its average loan-to-value for long and medium term debt offerings to farmers is 56% requiring potential applicants to cover the remaining portion as a deposit. Due to the competitive nature of the financial services industry, this service provider requires applicants to incur the majority of screening costs e.g. property valuations, external registrations and applications etc. Further, this service provider estimated that enforcement costs and costs incurred to recover bad debts are approximately 10% of the total value of products and services provided.

The timing of the cash flows required for agricultural activities is in-line with *pecking order theory*. The farm-firm is required to make the investment decision prior to cash in-flows being generated which results in a need for external financing. As the firm becomes more profitable, it reduces its extent of external finance and begins to fund operations through retained earnings. However, farming businesses generally lack access to equity markets, which implies significant reliance on the functioning of rural credit markets (Zhengfei and Oude-Lansink, 2006).

2.3. Intermediation Theory

The early schools of thought suggested that banks were the traditional financial intermediaries and served both an **economic function** and a **finance function**. In terms of economic theory, banks served to reduce friction in financial markets by reducing transaction costs and the extent of asymmetric information that resulted in a loss of societal welfare (Allen and Santomero, 1998). In terms of finance theory, banks serve to transfer wealth between economic agents by capturing these transactions in an accounting system of debits and credits. In addition, the financial function required banks to exchange deposits for currency by granting debtors access

² This financial services provider requested that its name be withheld

to credit. It is through these mechanisms that intermediaries determine entrepreneurial activity and whether or not assets will flow to projects with profit potential (Fama, 1980; Boháček, 2007).

Due to the fact that the depositor, depending on the terms of the deposit, could withdraw its funds at any time, deposits made were a liability for the bank. On the flip side, loans granted were an asset in favour of the bank as those debtors would be required to repay the capital loaned to them. However, in terms of the accounting function that banks serve, they are not actually required to hold the assets being exchanged in their books. In the perfect market context, with no government intervention, early intermediation theory saw banks being able to issue deposits and use those deposits to purchase assets i.e. grant loans or purchase fixed income streams.

Banks thus have a choice to invest in a portfolio that combines relatively safe assets like bonds and relatively risky assets such as extending credit to firms. Further, an individual depositor does not have access to risky projects offered in financial markets and uses banks as an intermediary to gain access to possible higher returns. In this way, banks compete with other issuers of deposits and choose a portfolio of investments that offers a rate of return commensurate with the risk appetite of depositors (Fama, 1980; Cociuba et al., 2016; Marini, 2011). Banks thus serve to assess risk and to channel funds between owners and users of capital (Gloy et al., 2005). It must be noted that despite this choice, banks and lenders have to comply with legislation that ensures issues such as reckless lending, liability-asset matching and solvency are at the forefront of any decision. An analysis of the appropriate legislation was deemed beyond the scope of this study.

If we return to the economic function of banks, and the role of smoothing transactions, it should make sense that technological advancement resulting in increased access to information at a reduced cost, should have made the intermediation function redundant (Allen and Santomero, 1998). However, the 1970s saw increased reliance on financial intermediaries due to intermediaries performing a risk management function. The emergence of new financial products like derivative

instruments and futures created an opportunity for owners of capital to increase the level of profits by reducing risks that did not add value (Allen and Santomero, 1998).

Consequently, increasing importance was placed on the functional role of financial intermediaries. Banks enjoyed expertise, and a comparative advantage, in the assessment and management of fixed income risk but soon realised that a loan granted to a debtor is merely a contract for a stream of future cash flows. These future streams of cash flows could be securitised i.e. debt could be swapped (*vis à vis*) for equity. By diversifying their portfolios of assets and swapping income streams of varying degrees of risk with counterparties, banks were able to generate superior returns without increasing the level of risk. Due to the emergence of swap contracts, as long as risk was reduced, the type of institution an agent used did not matter (Merton, 1995).

The continuous innovation and creation of new financial products saw intermediaries moving away from these historic roles towards a risk management function. In their analysis of financial intermediation theory, Scholtens and van Wensveen (2000) found that a core reason for the move away from historic roles was due to the initial assumptions surrounding financial markets not holding in reality.

In their 1990 analysis of *Imperfect Information and Rural Credit Markets*, Hoff and Stiglitz noted a number of possible reasons for rural credit market failures. Firstly, they noted that rural financial markets lacked conventional financial intermediaries. In line with Allen and Santomero's view, the lack of intermediaries can be attributed to the fact that increased access to information resulted in the intermediary function becoming redundant and market agents began interacting without intermediaries.

Secondly, they noted that rural credit markets do not operate as competitive markets. In conventional financial markets intermediaries act in the perfect market context i.e. with many available alternatives intermediaries are required to compete for deposits/loans by offering favourable rates of return/repayment. Many rural borrowers do not actively compare the rates offered by financial intermediaries which results in a reduced incentive for these intermediaries to offer more competitive interest rates or expand their agricultural credit portfolio (Gloy et al., 2005; Mcintosh et al., 2013).

The market structure has important connotations for the price of credit in the risk-return paradigm. In short, the price of credit is determined by considering the rate that the bank is required to pay to providers of capital, the borrowers' willingness to pay and the risk of default.

Thirdly, Hoff and Stiglitz observed that formal intermediaries in rural credit markets find it difficult to overcome three information asymmetry problems when providing access to credit, namely: screening, incentives and enforcement. Together, the three problems imply that lenders incur costs in determining the risk of individual borrowers and compel them to make payments in accordance with loan contracts.

From the borrower's side, to successfully signal his/her credit worthiness to formal lenders, a borrower would be required to provide credible proof of location, pledge assets and keep conventional records of their business affairs. Signalling in this manner would improve the chances of obtaining affordable credit. However, these signalling methods impose a cost to potential rural borrowers in excess of the benefit that would be derived from obtaining the related access to credit. Further, rural borrowers tend to be low-income earners with a lack of collateral, implying that they would pay relatively high rates of interest to account for the additional risk posed to the lender. These additional costs result in a lack of access to credit in rural areas (Straub, 2005).

2.4. What Does It Mean To Be Credit Constrained?

Neo-Institutional Theory suggests that any economic agent bases his/her/its decisions on the available information and incentives, which are determined by institutions i.e. through contracting and the imposition of transaction costs it is possible for institutions to control information and the subsequent decisions made by economic agents. It is this information asymmetry that results in financial market imperfections and restricted access to credit (Bokusheva et al., 2009; Zinych and Odening, 2009).

If one were to apply this theory to financial intermediaries, one could deduce that in a perfectly competitive and fully functioning credit market, with perfect information, it would be possible for a firm to borrow at any combination of collateral and interest to pursue its investment strategies (Boucher et al., 2008). It must be noted that the

assumption that markets are perfectly competitive with perfect information rarely holds in reality.

The individual firm's reliance on internal sources of funding is posited as a mechanism to measure the extent of credit constraints at a firm/project level (Kochar, 1997). However, if a firm is credit-constrained its investment decisions will be sensitive to financial measures like cash flow (Benjamin and Phimister, 2002; Boháček, 2007).

Apart from internal funding reliance, a firm is credit constrained if it has an unmet need for finance i.e. the firm is credit-rationed. This implies that either the firm has a need for funds but is unable to obtain external sources of funding, or the firm has been granted funding on terms that differ to its initial needs (Leon, 2015). The reason for credit rationing is owing to lenders not extending as much credit as they could at prevailing market interest rates, often due to non-price factors (Winter-Nelson and Temu, 2005).

In their analysis of *risk rationing and wealth effects in credit markets*, Boucher et al. (2008) suggest that borrowers can be credit rationed in three ways. Firstly, a potential borrower could be *quantity-rationed*, which means the borrower is involuntarily excluded from credit markets because he/she/it lacks the wealth to qualify for a loan. Secondly, a potential borrower could be *risk-rationed*, where the lender imposes significant contractual risk on the borrower through onerous collateral requirements. Thirdly, a potential borrower could be *price-rationed*, either due to no apparent need for credit or because it is unwilling to borrow at the offered cost of capital.

To assess the extent of control of institutions in credit markets, this study considers the role of contracting and transaction costs that result in farmers being credit constrained. We explore two important dynamics in the credit contract. Firstly, the relationship between collateral and interest rate, as it is one of the factors used to determine the borrower's cost of borrowing. Secondly, the presence of information asymmetries in credit contracts that results in costs for the both the borrower and the lender. We identify and explore the effects of credit-rationing in this context.

2.4.1. Collateral and Interest Relationship

In exploring the relationship between collateral and interest, the literature suggests that depending on the quality and liquidity thereof, the presence of collateral reduces the level of risk to the lender. This reduction in risk both increases the available supply of credit and results in a reduction in the interest rate for the borrower. The primary reason for this inverse relationship is that collateral protects the lender in the case of default (Helberg and Lindset, 2016).

Despite the fact that the borrower commits to the terms of a loan contract, it is often seen that borrowers do not honour those terms (Fafchamps, 1996). Boucher et al. (2008) posit that a positive credit supply will only exist in a situation where the lender is able to generate profits while the borrower expends high effort. To incentivise a borrower to honour the contract, it is both necessary and sufficient that a borrower pledges his/her entire wealth as collateral.

Failure to meet the contract terms often happens due to a variety of reasons which are beyond the control of the borrower, these include: a lack of critical inputs that halt production; untimely payment by consumers and customers and a lack of transport infrastructure that prevents the borrower from generating the income streams required to meet its commitments. It is important to note that the lag between production and receipt of revenue limits the ability of firms to begin the next production cycle while a lack of access to transport infrastructure due to affordability affects inventory management. Thus, credit offers an opportunity for both production smoothing and inventory management. (Vandenberg, 2003; Fisman, 2001).

In the event that a borrower is exposed to the aforementioned risks and the commitments become too onerous, there is an incentive for the borrower to lose interest in repaying the loan by way of default. To account for this incentive for the borrower to default and the possibility that the lender will lose its funds, loan contracts are inherently rigid requiring collateral as both a screening and an enforcement mechanism (Vandenberg, 2003 and Fafchamps, 1996).

2.4.2. Asymmetrical Information

Credit contracts impose costs to both the borrower and the lender. The costs are incurred to overcome the issues of information asymmetries that result from moral hazard and adverse selection. In the context of the credit contract, moral hazard refers to a situation where a borrower faced with higher interest rates is likely to pursue more risky projects, which increases the likelihood of borrower default. On the other hand, adverse selection refers to a situation where the lender extends credit to a borrower that is unlikely to repay his/her/its loan (Stiglitz and Weiss, 1981; Bester, 1987).

The borrower incurs costs to signal that he/she/it is a good borrower and will repay the loan. The aforementioned issue of collateral is seen as an ex-ante signalling mechanism as a bad borrower is unlikely to exert the high levels of effort needed for his/her project to succeed to meet the credit contract terms; he or she will not post collateral, vice versa (Niinimäki, 2015).

The lender incurs costs to screen, monitor and enforce the credit contract to ensure that the repayment terms will be met (Daniels, 1999; Vandenberg, 2003). Information asymmetries result in high costs to obtain information about borrowers which has led to the common lender perception that it is more effective to service larger borrowers. The resultant effect is the emergence of a credit gap where larger borrowers are able to obtain credit at a cost advantage relative to smaller borrowers (Gloy et al., 2005; Kochar, 1997).

When compared to urban areas, it is argued that due to a higher degree of social cohesion it is easier to overcome issues of information asymmetry in rural areas. Rural commercial relationships tend to be based on trust with the possible damage of reputation serving as an ex-ante enforcement mechanism for failure to adequately perform in terms of contracts. Further, the strength of a commercial relationship is positively related to the length of time of that relationship. The reason for this is that time allows for trust to build between contracting parties through the flow of information which overcomes the issues of information asymmetry that hinder access to credit (Fisman, 2001; McMillan and Woodruff, 1999). These facts imply that

screening, monitoring and enforcement costs can all be overcome through personalised credit contracting in rural areas (Vandenberg, 2003).

An example of such a personalised credit contract is illustrated through an explanation of a soft-loan or trade credit agreement. Consider a farm-firm that requires credit to finance its working capital for the next season's crop. The firm is credit constrained and is unable to approach a conventional financial intermediary to purchase the inputs it needs to maximise its productivity. Consequently, the farm-firm approaches a familiar 3rd party or cooperative for assistance to purchase the inputs required prior to planting.

The farm-firm then conducts its farming activities and harvests its produce for sale. After the farm-firm receives the income from sales, and prior to taking any other business decision, the value of the loan granted to the farm-firm and any agreed upon transaction costs is repaid (Bellemare, 2010). These agents have sector specific information and are better able to assess the related risks (Vandenberg, 2003). In addition, failure to honour the contract terms would result in reputational damage and the resultant likelihood that the farm-firm is excluded from future transactions. These soft factors serve as an enforcement mechanism to ensure repayment.

2.5. Conclusion

This chapter explored literature relevant to the provision of financial services in the agricultural sector. The literature suggests that agricultural investments are inherently more risky than those in other sectors due to reliance on many external factors that all borrowers are faced with, implying significant covariate risk exposure for financial services providers. Failure to access affordable credit results in farmers not pursuing the productivity enhancements necessary to remain competitive in the industry. In addition, credit-constrained firms place significant reliance on internal sources of funding and are unable to benefit from leverage to boost returns.

FSPs serve to smooth transactions through risk assessment that ensures funds flow to projects with profit and repayment potential. Ultimately, FSPs are businesses that aim to maximise their profits by extending credit at a higher rate than their respective costs of borrowing. Information asymmetries result in issues of moral hazard and

adverse selection, which could result in loss of assets by FSPs in the event of borrower default. To account for this, FSPs impose significant screening, monitoring and enforcement costs which result in banks imposing restrictive costs on the lender to incentivise repayment. However, it is possible to overcome these information asymmetries in rural areas due to improved flows of information that could be used to devise personalised contracting mechanisms.

3. INDUSTRY OVERVIEW AND DATA COLLECTION

3.1. Introduction

The following chapter provides insight into the study area and data that will be used to assess if differences in financing mechanisms vary depending on the type of credit rationing experienced by seed potato farmers in South Africa. It begins with an overview of the seed potato industry in South Africa and attempts to explain its relative importance as a staple food. Thereafter we provide information about the seed potato growing areas in South Africa with particular emphasis given to the western region of the Free State Province as the study area. Finally this chapter identifies how the issues of sampling observations for qualitative analysis are handled in this study.

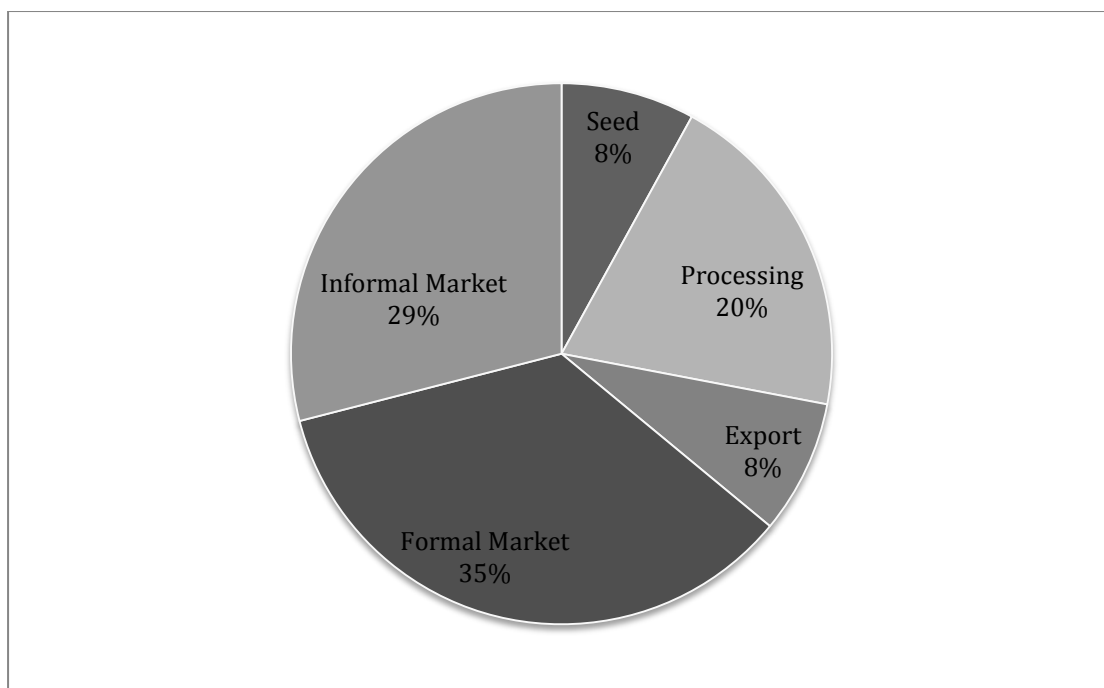
3.2. Overview of the Seed Potato Industry in South Africa

3.2.1. Potato industry

Globally, potatoes (*Solanum tuberosum*) are the third largest food crop after rice and wheat respectively. However, when compared to cereal crops, it has been found that potatoes generate approximately 25% more dry-matter available for human consumption (Haverkort and Struik, 2015). In addition, potatoes have a high nutritional content, require a shorter growing period and use less water to produce an equivalent amount of calories than any of the other major food crops (Scott et al., 2013).

These facts imply that potatoes offer the potential to be highly reliable in the context of food security. Evidenced by the doubling of the potato production area in developing countries between 1994 and 2011 and the 5.5% increase in gross potato consumption in South Africa between 2010 and 2014 (Devaux et al., 2014; DAFF, 2016)

The potato industry forms a significant part of vegetable production in South Africa, accounting for approximately 54% of the value of all vegetables produced in 2013. The primary potato industry's value is estimated to be in excess of R6bn and includes: seed producers, processors, the informal market, the formal market and exports. Figure 1 (below) provides an illustration of the shares attributable to each sub-sector. (DAFF, 2014)



source: adapted from the Potato Industry Report for 2014/15, available at: http://www.potatoes.co.za/SiteResources/documents/Potato%20Industry%20Report%202014_2015.pdf

Figure 1: Potato Marketing Channels in South Africa

Potatoes are grown across the country throughout the year, separated across 16 distinct growing regions. Figure 2 (below) provides a map showing the location of each of the regions. Each region plants and harvests during different months to ensure a constant supply of potatoes is available for delivery to fresh produce markets and processors. Potatoes are grown under both irrigation and dry-land conditions with the former accounting for approximately 80% of the potato area planted in South Africa. The major commercial potato producing regions are Limpopo (29%), the Western Free-State (18%), the Eastern Free State (17%) and the Sandveld (8%) that collectively account for 72% of potato yield in 2015 (Potatoes South Africa, 2016).

The industry comprised 578 commercial farming units in the 2013/2014 production year with the aforementioned regions having 93, 43, 75 and 84 registered farmers respectively. Further the average area planted per farming unit in these regions was 122, 165, 147 and 90 hectares respectively. If we compare this to the next largest growing region, the South Western Free State, with 5% market share, 27 registered farmers and an average unit size of 52 hectares being planted, we see that the four

major producing regions have a significant scale advantage over the smaller producing regions (Potatoes South Africa, 2016).

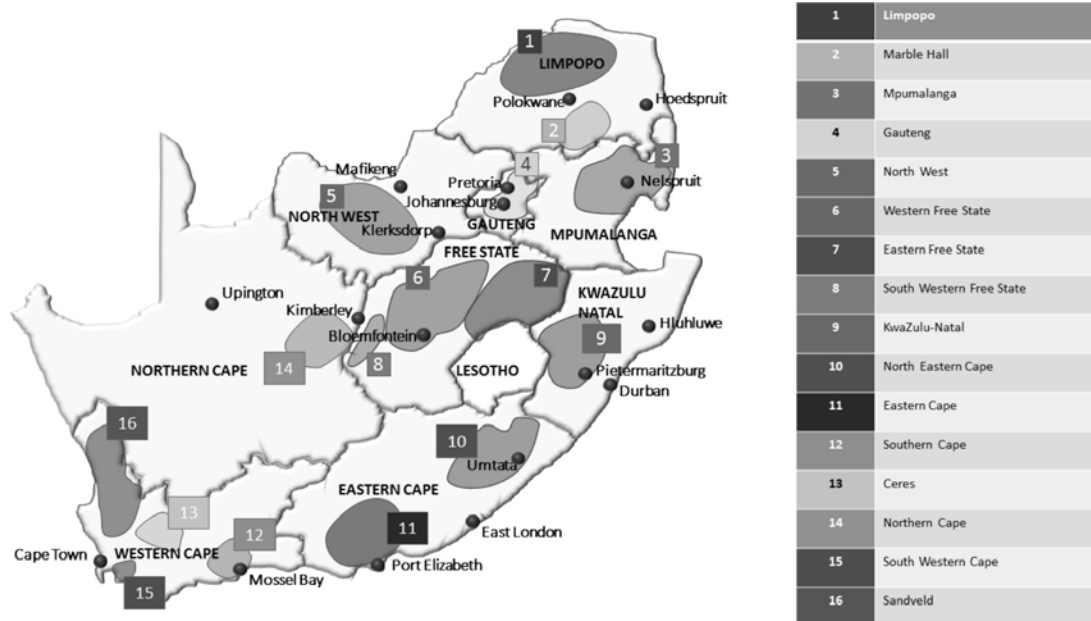


Figure 2: Potato Growing Regions

Source: Potatoes South Africa, available at: <http://www.potatoes.co.za/SiteResources/images/All%20regions.png>

3.2.2. Seed potatoes and certification

The previous section provided an overview of the potato industry in South Africa. Before we continue, it is pertinent to answer the question: what makes a seed potato different from an ordinary, or commercial table potato?

Seed potatoes are tubers used for the production of a commercial potato crop. The seed begins as plant tissue culture of a recognized variety that is propagated in a laboratory to generate potato plantlets with micro-tubers. These micro-tubers are multiplied to yield mini-tubers that are grown in climate-controlled greenhouses or tunnels for approximately 80 days before being transferred for field cultivation. Thereafter the mini-tubers are grown for between 100 to 120 days in the field and harvested as Generation-0 seed. The seed is then transferred to growers for further multiplication as future generations of potato seed. It is important to note that both micro-tuber and mini-tuber multiplication occurs under sterile conditions to ensure that no pathogens or viruses are present. The presence of disease, tuber volume and tuber size all affect quality and the consequent value received for the seed (Wróbel, 2014).

In the South African context, mini-tubers can only be considered as seed once certified by the South African Seed Potato Certification Scheme in accordance with the Plant Improvement Act 53 of 1976. Certification occurs through an assessment of a sample of the crop using stringent sampling guidelines. The assessment comprises a visual inspection of the presence of viruses and pathogens on the leaves of the plants at two separate occasions through the growing cycle. The visual inspection is followed by laboratory testing and analysis after harvest; a crop will be certified if the virus content of the sample is equal to or less than 2.5%.

Potato seed certification is dependent on the number of multiplications post Generation-0 and quality to ensure that buyers are fully informed about the expected virus status of their crop. Certified seed may be multiplied up to 8 consecutive times before registration is withdrawn and the tubers are no longer considered as seed. Alternatively registration may be withdrawn if the quality standards are not met (Potato Certification Service, 2016; South African Seed Potato Certification Scheme 2013).

Successful potato production is dependent on the quality of the seed used by commercial growers as it impacts both yields (quantity) and the likelihood of disease (quality). The seed potato industry comprises 8% of the total potato crop and is estimated to generate annual turnover of R480m (Potatoes South Africa, 2015). There are 220 registered seed growers that collectively produce approximately 162 797 tons of seed annually (Potato Certification Service, 2015).

In discussions with members (Postemus, 2016) of the Potato Certification Service (PCS), it was found that despite the fact that there are 220 registered growers many of these growers are no longer active. These growers are still registered and entitled to keep their individual grower number(s) but either ceased potato farming altogether or now farm commercial, or table, potatoes. In addition, the members of the PCS indicated that some of the registered growers currently have more than one grower number registered to their respective farming units i.e. it is possible for a single farming unit to have multiple grower numbers registered to other natural or juristic persons. Thus, the total number of active seed growers is significantly below the

aforementioned 220. This will be elaborated on further in the data section of this chapter.

A total of 9 763 hectares of seed potatoes were planted in the 2014/15 production year with the Western Free State and KwaZulu-Natal being the primary growing regions with 4 608 hectares and 1 401 hectares being planted respectively. Table 1 (below) provides a breakdown of the hectares planted while Table 2 provides a breakdown of the production in terms of 25kg bags of seed. The tables provide a breakdown for each of the registered seed potato growing areas for the period between 2008/2009 and 2014/2015.

The industry achieved peak planting of 10 415 hectares in 2010/2011; however, these numbers had declined by 6.26% to 9 763 in the 2014/2015 production year. In terms of regional trends experienced in the 14 growing regions, the data indicates that only the Western Free State, Limpopo and Eastern Cape regions increased the area planted. In the period between 2004/5 and 2014/5, we see that the area under production increased by 3.8% while yields increased by 29,18%.

Table 1: Breakdown of Seed Potato Growing Areas (Hectares)

REGION	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Sandveld	1 527	1 708	1 150	728	438	481	627
Ceres	287	234	245	233	248	160	126
Southern Cape	144	97	95	101	106	89	76
Northern Cape	790	858	1 129	1 115	630	581	674
Western Free State	3 719	4 055	4 199	4 535	4 446	4 608	4 961
North West	410	620	521	525	461	424	509
Mpumalanga	426	423	541	578	443	464	468
Eastern Free State	18	144	231	249	234	160	296
Limpopo	36	63	143	20	68	90	207
Kwa-Zulu Natal	1 524	1 787	1 915	2 016	1 655	1 401	1 432
North Eastern Cape	93	172	224	267	186	260	336
Gauteng	-	-	-	-	-	-	-
Eastern Cape	2	6	21	25	83	54	51
South Western Cape	-	-	-	-	-	-	-
Total	8 976	10 167	10 415	10 393	8 998	8 772	9 763

Source: Adapted from Potato Certification Service National Statistics 2004/2005 – 2014/2015, available at: http://www.potatoes.co.za/SiteResources/documents/Potato%20Industry%20Report%202014_2015.pdf

Table 2: Breakdown of Seed Potato Growing Areas (25kg Bags)

REGION	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Sandveld	802 415	796 610	470 504	271 964	175 556	330 734	144 772
Ceres	91 208	137 162	116 233	134 887	57 819	104 826	36 108
Southern Cape	63 114	55 689	54 329	48 832	48 483	47 908	60 387
Northern Cape	218 762	307 653	504 215	505 856	315 802	385 875	448 770
Western Free State	2 245 981	2 338 402	2 208 216	2 288 561	2 321 196	2 963 864	2 884 293
North West	553 995	551 015	565 071	737 251	793 147	887 115	900 293
Mpumalanga	245 763	294 841	413 475	446 813	266 069	362 545	375 001
Eastern Free State	15 974	64 954	88 577	96 909	126 673	119 294	237 293
Limpopo	16 907	50 735	81 355	16 200	80 405	76 108	78 437
Kwa-Zulu Natal	1 292 496	1 696 776	1 428 962	1 337 837	1 256 036	1 029 918	1 052 597
North Eastern Cape	67 746	149 838	145 885	81 251	91 505	182 805	336 952
Gauteng	-	-	-	-	-	-	-
Eastern Cape	437	3 129	9 067	13 104	24 816	20 887	29 538
South Western Cape	-	-	-	-	-	-	-
Total	5 614 798	6 446 804	6 085 889	5 979 465	5 557 507	6 511 879	6 584 441

source: Adapted from Potato Certification Service National Statistics 2004/2005 – 2014/2015, available at: http://www.potatoes.co.za/SiteResources/documents/Potato%20Industry%20Report%202014_2015.pdf

According to the Registrar of Plant Improvement, there are over 100 different cultivars of potatoes planted in South Africa, which are owned by 18 registered holders of plant breeders' rights (DAFF, 2015). Cultivars are developed through significant investments in research and development to ensure that the seed is able to maximise value for potato farmers. Cultivars are developed for a number of reasons, including: to increase varietal tolerance to pathogens, to improve yields under changing economic conditions, to introduce new varieties demanded by the market and to accommodate different methods of crop management employed by farmers (Jeuffroy et al., 2014).

The three most prominent cultivars in South Africa are Mondial, Sifra and Valor accounting for market shares of 38.44%, 19.45% and 4.46% respectively. Despite the presence of over 100 cultivars, the aforementioned three constitute more than 62% of the entire potato market (Potato Certification Service, 2016)

3.3. Study Area

The Western Free State is the single largest seed potato-growing region in South Africa in terms of both the area planted and yield. The area boasts optimal climatic conditions for seed potato production while the ability to irrigate from the Vaal River limits the region's reliance on rain to maintain yields. The region is situated between the towns of Bloemhof and Boshof in the Lejweleputsa District Municipality of the Free State Province. There are 34 registered growers in the region that account for 43% of all certified potato seed in South Africa (Potato Certification Service, 2016). The area was chosen as the study area due to the region's concentration of market share and seed growers, implying that an analysis into the perspectives surrounding financial mechanisms could be used to develop an understanding of the unique issues seed growers in the region are exposed to.

Upon arriving in the area and after discussions with individuals with industry knowledge, it was found that approximately seven of these growers were no longer active, two growers had moved operations to different provinces or growing regions and three growers represented a single farming unit. As a result, the sample size was reduced from the original 34 growers to 23 growers. However, the authors still required significant industry representation and sought responses from growers in other regions. Ultimately, seventeen responses were received, the majority of which were from the Western Free State region, while responses were also received from the North West, Kwa-Zulu Natal and Mpumalanga regions. The respondents collectively accounted for 3 965 hectares or 40.61% of South Africa's area under seed potato production.

3.4. Data Collection

The respondents were arbitrarily chosen as a convenience sample as the authors have close working contacts with producers in the area and industry. As such, the convenience sample is not representative of the entire seed potato-grower population

in South Africa nor does it have the power to make inferences about the entire seed grower population of South Africa. Although the sample size is relatively small the in-depth questions and additional information obtained through the interview process provided a rich database to qualitatively assess farmers' perceptions about their current financing arrangements.

The analysis used a questionnaire of 56 questions arranged into six particular areas of interest. A copy of the full, unanswered questionnaire is available in Appendix 1. The questions were an amalgamation of focus areas in two other studies, and additional questions the authors thought to be pertinent in the context of farmers' perceptions around financial services and products and the manner in which they are employed in their respective businesses. The two studies used as a foundation, were that of Pereira et al. (2016) and Musshoff and Hirschauer (2011).

In order to obtain the correct data, the questions either had preformed answers requiring the respondent to make a selection, required respondents to rate statements using a Likert scale or required respondents to inform the author of their independent responses. These six areas were titled 'sections' but each section focused on a particular facet of the farmers' perceptions about financial service provision. The focus areas were:

1. General farmer and farming unit description
2. Financial services products and relationship with FSPs
3. The role of external finance to your business
4. Risk and risk mitigation perspectives
5. Investment Philosophy
6. Sustainability Outlook

An invitation to participate in the research and a copy of the questionnaire was sent to the initial sample of 23 registered growers. However, the questions were of a sensitive nature and it was advised that the authors conduct the research through a structured interview with the respondents that indicated they were willing to participate in the study. The interviews served to broker a relationship with each respondent that would allow them to respond openly and honestly to all of the

questions posed. The authors managed to conduct 13 interviews that took an average of two hours to complete while the remaining responses were received electronically.

The surveys and interviews were conducted with and answered by the owners or heads of each farming unit and served three primary functions. Firstly, they served to identify the perceptions around the financing mechanisms/financial services being used in the seed potato industry. Secondly, the surveys and interviews served to identify if and in what manner these seed growers were credit constrained. Finally, the surveys and interviews were constructed with a view of obtaining general farming unit and socio-economic information from the respondents.

3.5. Conclusion

This chapter identified that due to the high nutritional content, the efficient manner in which potatoes generate calories and the contribution made to fresh produce markets, the potato industry is strategically important. We identified how seed potatoes are certified and the determinants of seed quality that affect the prices received by farmers. In addition, the industry composition and geographic dispersion was explained in relation to the study area. Finally, this chapter explained the sample and the methods employed to gather the data.

4. DATA

4.1. Introduction

The previous chapter shared insight into the importance of potatoes as a staple food; provided an explanation of the industry and what it is that makes seed potatoes different to commercial or table potatoes; explained the study area and outlined the manner in which the primary data for the research was collected. As previously mentioned, a total of 17 responses were received that together accounted for approximately 40.61% of the total seed production area in South Africa. Despite the significant proportion of industry coverage, the concentration in the industry implies that statistically significant inference from the data is not possible. A complete spreadsheet of the responses collected is available in Appendix 2.

For the purposes of this section the authors will identify the key findings from the data collected. Due to the statistical inference limitations, the data will be analysed both qualitatively and descriptively to provide an indication of the common responses obtained from the sample. Where pertinent, unique responses gathered through the interview process will be identified. In order to account for data presentation uniformity, the responses were collected and coded to reflect binary variables or Likert scales where appropriate.

It has been decided to group the responses according to the six focus areas identified in the questionnaire, each of which will be explained in turn and the final sub-section will provide a conclusion.

4.2. General Farmer and Farming Unit Descriptive Information

The first section of the questionnaire involved fifteen questions that attempted to identify the following descriptive information: age, farming experience, family life, extent of farming operations, education level, reason for farming, reason for farming seed potatoes, self-categorisation as a farmer, farming entity structure and the initial access to and financing choice of land, moveable assets and working capital. The salient points of the abovementioned will be discussed in the paragraphs to follow.

4.2.1. Farmer and Family Information

All of the respondents indicated that they were at least second-generation male farmers with an average age of 51,41 years and average farming experience of 21,76 years. In terms of their family life, we found that 15 or 88,23% of the respondents were married and 88,23% had children. In terms of qualifications or 'Edulevel' the data was amended to reflect a five-point Likert scale with 1 being matric, 2 being a diploma, 3 being an undergraduate degree, 4 an honours degree and 5 a masters degree.

We found that three respondents (17,65%) had a matric qualification, three respondents (17,65%) had a higher diploma in various fields, the average respondent (47,95%) had at least an undergraduate degree, with 2 respondents (11,76%) having an honours degree and one respondent (5,88%) having a masters level degree. In terms of entity structure, we found that 13 or 76,47% decided to farm as a private company of which 5 respondents or 29,41% chose to farm under joint-equity interest. In addition, 2 respondents indicated that they farmed under a business trust structure while the remaining 2 respondents indicated they farmed as a sole proprietorship. These findings are summarized in Table 3 below.

Table 3: General Farmer and Family Description

Number	Age (Years)	Farming Experience (Years)	Married	Children	First Generation Farmer	Entity Structure	Edu level
1	51	22	Yes	Yes	No	Trust	2
2	66	25	Yes	Yes	No	Company MI	3
3	51	11	Yes	Yes	No	Company JI	4
4	32	5	Yes	No	No	Company JI	3
5	43	9	Yes	Yes	No	Company JI	1
6	63	34	Yes	Yes	No	Company MI	3
7	52	27	Yes	Yes	No	Company MI	3
8	58	34	Yes	Yes	No	Company MI	5
9	43	23	No	Yes	No	Sole Proprietorship	2
10	57	30	Yes	Yes	No	Company MI	3
11	61	33	Yes	Yes	No	Company MI	4
12	45	23	Yes	Yes	No	Company MI	3
13	54	20	No	No	No	Trust	1
14	37	4	Yes	Yes	No	Company JI	1
15	60	30	Yes	Yes	No	Sole Proprietorship	2
16	47	15	Yes	Yes	No	Company JI	3
17	54	25	Yes	Yes	No	Company MI	3
Averages	51,41	21,76					

4.2.2. Farming Operations

The general description section also identified the extent of farming operations. However, given recent policy developments around land ceilings and the sensitivity around this issue, it was requested that the respondents identify the extent of farming operations per annual plant or total breeding herd in the case of livestock. We found that the primary crop in terms of revenue generation for all of the respondents was their potato crop, while 14 or 82.35% of these respondents farmed maize with four respondents (23,53%) farming significant portions of maize under dry-land conditions.

In addition, eight (47,06%) of the farmers included onions in the rotation system while only 4 (23,53%) had more recently invested in pecan nuts as part of their rotation system. Finally, we found that 8 or 47,06% of respondents included livestock as part of their diversified farming operations.

In terms of potato production, we found that the average farmer plants 233 hectares of potatoes on an annual basis. However, this average is not necessarily accurate due to the fact that respondent 10 is an outlier farming 700 hectares on an annual basis. It might be more prudent to consider the median of 202 hectares as a descriptive statistic in this case. We found similar issues with the maize crop where respondents 8, 9, 12, and 17 all farm maize and/or wheat under dry-land conditions which requires a greater extent of land. The aforementioned results are illustrated in Table 4 below.

Table 4: Area Farmed and Farming Operation Data

Respondents	Hectares Farmed (Total)	Potatoes	Maize	Onions	Pecans	Cattle (head)
1	617	230	200	17	170	
2	580	200	300	80		
3	156	156				100
4	600	300	300			
5	461	140	296	25		
6	478	312	144		22	
7	260	260				300
8	2760	200	1750	60		300
9	1429	229	1200			
10	700	700				
11	348	202	80	66		1000
12	1030	470	100	300	160	1000
13	770	300	400		70	
14	120	10	110			22
15	36	6	24	6		500
16	125	100	25			400
17	3150	150	3000			
Average	801,18	233,24	566,36			

3

4.2.3. Identification and Categorisation

In terms of identifying why farmers chose their current profession, the respondents were asked to explain why they decided to farm, why they decided to farm seed potatoes and how they would choose to categorise themselves as farmers. In terms of the latter, the respondents were requested to pick one of four possible options summarised as: committed environmentalist, profit maximising, top performing farmer and professional farmer. Details of how these options were described can be found in Appendix 1, particularly Section 1 Question 9. We find that 7 respondents (41,18%) identified with being a professional farmer, 3 respondents (17,65%) identified as committed environmentalists, 5 respondents (29,41%) primarily farmed to maximise their profits while 2 respondents (11,76%) wanted to be recognised as top performers in the industry. Table 5 below outlines the results of these three primary questions.

³ The total hectares farmed for respondent eight does not sum to the value provided in the total column. This is due to the fact that respondent eight was the only respondent that engaged in additional crops. See Appendix 2 pp98 for further detail

In their own explanations, we found that all but 2 of the 17 respondents (88,24%) indicated that the primary reason for them farming was due to it being a family business. Further, of these 17 respondents, only 4 (23,53%) indicated that this was the sole reason for their choice of profession. The remaining 13 respondents with more than one reason for farming either noted profitability, always having wanted to farm or enjoying the rural lifestyle as their secondary explanation with respective response counts being 1, 9 and 3.

In terms of their self-identified reason for farming seed potatoes, we found that 7 respondents (41,18%) owed their choice to a family business, 13 respondents (76,47%) identified the possibility of achieving high margins in the seed industry. An interesting observation from the data was that all of the respondents that identified industry linkages as a primary factor for their choice to farm seed potatoes identified the high margin potential and did not come from a seed farming family business. A further 4 respondents (23,53%) noted diversification and the risk protection as determining factors in their choice to farm seed potatoes.

Table 5: Self-Identified Reasons for Farming and Categorisation

Respondents	RF Family business	RF Profit	RF Want to farm	RF Rural lifestyle	RP Family business	RP High Value Crop	RP Industry Linkages	RP Interested in Cultivation	RP Risk Protection/Diversification
1	Yes	No	Yes	No	Yes	No	No	Yes	No
2	Yes	No	Yes	No	Yes	No	No	No	No
3	Yes	No	No	No	No	Yes	Yes	No	No
4	Yes	Yes	No	No	No	Yes	No	No	No
5	Yes	No	No	Yes	No	Yes	Yes	No	No
6	Yes	No	Yes	No	Yes	No	No	No	No
7	No	No	No	Yes	No	Yes	Yes	No	No
8	Yes	No	Yes	No	No	Yes	No	No	Yes
9	Yes	No	Yes	No	No	Yes	Yes	No	No
10	Yes	No	Yes	No	Yes	Yes	No	No	Yes
11	Yes	No	Yes	No	No	Yes	No	No	Yes
12	Yes	No	Yes	No	Yes	Yes	No	No	No
13	Yes	No	Yes	No	Yes	Yes	No	No	No
14	No	No	No	No	No	Yes	Yes	No	No
15	Yes	No	No	No	No	No	No	No	Yes
16	Yes	No	No	Yes	No	Yes	Yes	No	No
17	Yes	No	No	No	Yes	Yes	No	No	No
Count	15	1	9	3	7	13	6	1	4

4.2.4. Financing Entry Into the Industry

In terms of access into the agricultural industry and how the respondents were able to finance their entry, the questionnaire requested respondents to provide information on how they obtained access to their first piece of land, how they purchased their first piece of land, how they financed their initial moveable assets and how they financed their initial working capital requirements.

We found that farmers either purchased, inherited or rented the initial land they farmed on with response counts of 8, 3 and 6 respectively. In terms of purchasing their first piece of farmland it was noted that 8 respondents (47,06%) mortgaged the properties, 4 respondents had assistance with a 3rd party or family member standing as surety, 3 respondents had sufficient assets to post as security while one respondent paid cash.

In considering how the respondents chose to finance their initial moveable asset requirements, 11 respondents (64,71%) indicated that they had used a term-loan facility from a financial service provider while only two of these respondents indicated that they used this mechanism in conjunction with other mechanisms. Of the remaining respondents, it was found that 4 (23,53%) used cash, 2 (11,76%) used a soft loan facility whilst inheritance and rental agreements had equal responses of 1 (5,88%) each.

Financing working capital is also a major consideration for any farming business; we found that the farmers that have the least amount of experience tend to use combinations of multiple financing mechanisms to finance working capital. As such it is difficult to analyse proportional responses as some respondents had indicated they use more than one mechanism. However, we noted that overdraft facilities were the most common mechanism used followed by soft-loans and financing from local cooperatives. The use of cash or supplier credit terms (SCT) tended to be accompanied by another mechanism as well. The actual response summaries to the above sub-section can be found in Appendix 2.

4.3. Financial Services Products and FSP Relationship

In assessing the use of financial services products and the strength of the FSP relationship, the authors used a series of 10 questions to identify which financial service products were currently being used by each respondent and to ascertain which factors would result in a respondent considering switching their current FSPs.

4.3.1. Current Financial Services Products Used

We identified that financial services provision should include a number of products, including: savings, transactional/transmission services, emergency credit or overdraft facilities, structured term-loans for asset financing over the medium term, mortgage financing for the purchase of immovable property, investment advice, asset insurance, audit services and risk mitigation products like hedging and futures contracts. Table 6 below provides a summary of the financial services products findings.

In testing which of these products are currently used, we found that all respondents use the transaction or transmission function while 16 respondents (94,11%) use overdraft facilities and asset insurance products. We found that 15 respondents (88,23%) use audit services, equally owing to a perceived statutory requirement and the need for accurate business assessment. Further, despite the fact that 11 respondents (64,71%) use crop insurance this insurance is only used for secondary crops like maize and onions. Farmers suggested that the current insurance offering for their potato crop was too expensive given the limited risk exposure. 52,94% of respondents indicated that they do use investment advisory services but acknowledged that the use of these services was not a significant factor when making investment decisions.

In terms of medium-long term credit, we found that 11 respondents (64,71%) use term-loan facilities to finance their moveable assets. An interesting fact that came through the interviews was that those farmers that didn't use term loan facilities subscribed to a philosophy of not purchasing assets unless you could afford to pay for those assets with cash. Long-term lending and mortgage products are vital for farming business; we found that 10 respondents (58,82%) do use mortgage products while 15 respondents (88,23%) had used mortgage loan products in their lifetimes; only two respondents had never used mortgage products, one owing to a preferential family rental agreement and the other owing to a large cash endowment.

A further fact that came through the interview process was that as the respondents reduced their debt levels and repaid their mortgage bonds, some of them maintained access bonds in the event that emergency credit was needed.

Table 6: Financial Services Products Used

Respondents	FS Savings Account	FS Transaction Account	FS Overdraft	FS Term-loan	FS Mortgage loan	FS Investment Advice	FS Crop Insurance	FS Asset Insurance	FS Audit Services	FS Hedging/Futures Contracts
1	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
2	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
3	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No
5	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
6	Yes	Yes	No	No	No	No	Yes	Yes	Yes	No
7	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
8	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
10	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No
11	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
12	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No
14	No	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes
15	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
16	No	Yes	Yes	No	No	No	No	Yes	No	No
17	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
Count	4	17	16	11	10	9	11	16	15	5

4.3.2. FSP Relationship Strength

In testing the respondents' FSP relationship strength, we found that 11 respondents (64,71%) used two FSPs or less while 4 respondents (23,53%) used more than three FSPs. The average length of FSP relationship was 18,71years, with 11 respondents (64,71%) using the same service providers since they began farming. In addition, we found that only three respondents (17,65%) identified the most favourable terms offered as the determining factor in choosing a FSP, while family history and a relationship with the account manager proved stronger determinants with eight responses (47,05%) and six responses (35,29%) respectively. When asked if they would recommend their current FSPs over a five-point Likert scale, we found that the average score was 4,35 indicating that the majority of respondents would recommend or highly recommend their current service providers.

Table 7: FSP Relationship and Determining Factor

Respondents	Number of FSP's used	FS Average Length of FSP relationship (Years)	Family History	Relationship Manager	MFT
1	2	15	Yes	No	No
2	4	20	No	No	Yes
3	2	11	No	Yes	No
4	3	5	No	No	Yes
5	4	6	Yes	No	No
6	1	15	No	No	Yes
7	1	27	No	Yes	No
8	4	34	No	Yes	No
9	2	23	Yes	No	No
10	2	15	No	Yes	No
11	2	33	No	Yes	No
12	3	23	Yes	No	No
13	1	20	Yes	No	No
14	2	4	Yes	No	No
15	4	30	Yes	No	No
16	1	12	No	Yes	No
17	2	25	Yes	No	No
Count	2,35	18,71	8	6	3

In interview discussions, it was found that the respondents tend to be loyal clients and seldom switch service providers unless a major breakdown in the relationship occurs or technical error is made. In addition, onerous FICA compliance imposes an administrative switching cost. Nine respondents suggested they regularly compare the service offering of available FSPs; of these seven respondents indicated they had considered switching their service providers. Further, we found that switching due to a change in location or a change in service offering would only be considered by two respondents (11,76%) in each case. Loan application requirements, a change in account manager, a change in the interest rate and a change in transaction costs would result in between five respondents (29,41%) and seven respondents (41,18%) considering changing service providers.

Table 8: Factors Determining Willingness to Switch FSPs

Respondents	FSP change considered	RC Interest rate	RC loan application requirements	RC account manager	RC transaction costs	RC location	RC service offering	Regular comparison of FSPs
1	No	No	Yes	Yes	No	No	No	No
2	No	Yes	No	No	Yes	Yes	No	No
3	No	No	No	No	No	No	No	No
4	No	No	Yes	No	No	No	No	No
5	Yes	No	Yes	No	Yes	No	No	Yes
6	Yes	No	No	Yes	Yes	No	No	Yes
7	No	No	No	No	No	No	No	No
8	Yes	No	No	Yes	Yes	No	No	Yes
9	No	No	No	No	No	No	No	No
10	No	No	No	No	No	No	No	Yes
11	Yes	Yes	No	No	Yes	No	Yes	Yes
12	No	No	No	No	No	No	No	No
13	No	Yes	No	Yes	No	No	No	Yes
14	Yes	Yes	Yes	No	Yes	No	Yes	Yes
15	No	Yes	No	No	No	No	No	Yes
16	Yes	Yes	No	Yes	Yes	Yes	No	No
17	Yes	No	Yes	Yes	No	No	No	Yes
Count	7	6	5	6	7	2	2	9

4.4. The Role of External Finance

Farming activities are capital intensive in nature and require significant amounts of external finance. In assessing the extent of this importance, we considered how respondents view external finance in each of their businesses, whether or not they are credit constrained and if so, in what manner are they constrained and how they choose to use any surplus cash their business generates. As part of the analysis, the questionnaire also asked the respondents to state a number of financial ratios, which would assist in analysing business strength. After discussions with financial service providers it was found that these ratios would not assist in improved signalling efforts as they are considered on a case-by-case basis i.e. no benchmark ratios were provided. These ratios will not be discussed but are available in the full set of results in Appendix 2.

Having developed an understanding that farmers require three forms of finance, namely: long-term finance required for the purchase of immovable property and land, medium-term finance for the purchase of moveable assets and short-term finance for working capital needs, respondents were requested to rate the importance of external finance using a five-point Likert scale. We found that 10 respondents (58,82%) viewed external finance as extremely important to the functioning of their business, while two respondents (11,76%) suggested that external financing was important to their businesses. Further, we found that only one respondent (5,88%) suggested that external finance was extremely unimportant to his business. The remaining respondents were neutral (3) or felt that external finance was insignificant.

Respondents were also asked whether they deemed external finance to be a requirement, a strategic consideration or an indication of poor management. In terms of the latter, not a single respondent agreed; 10 respondents indicated that external finance was a requirement while seven respondents considered external finance to be a strategic consideration. It is important to note that respondents identified that the role of external finance changes over the life-stage of the businesses i.e. an inverse relationship, and that they aimed to reduce reliance on external finance over time.

This sentiment was further emphasised when respondents were asked how they choose to use the surplus cash generated in their respective businesses. We found that 10 respondents (58,82%) suggested that surplus cash was used to reinvest in their businesses in lieu of additional external credit, with eight of these 10 respondents indicating that external finance is either extremely important or important to their respective businesses. Of the four respondents (23,53%) who indicated that they use surplus cash for investment in off-farm assets, we found that two of these respondents felt that external finance was unimportant, while 1 respondent felt that he was neutral to the role of external finance and one respondent felt that external finance was extremely important to his business. The results are summarized in Table 9 below.

Table 9: Perceptions Around External Finance and Use of Surplus Cash

Respondents	LS Importance of External Finance	SC Repay L/T debt	SC Repay S/T debt	SC Reinvestment	SC Invest (off-farm)	Strategic Consideration	Requirement
1	3	No	No	No	Yes	Yes	No
2	3	No	No	Yes	No	Yes	No
3	5	No	No	Yes	No	No	Yes
4	5	No	No	Yes	No	Yes	No
5	5	No	No	Yes	No	No	Yes
6	1	No	No	No	Yes	No	Yes
7	3	No	No	Yes	No	No	Yes
8	5	Yes	No	No	No	No	Yes
9	5	No	No	Yes	No	No	Yes
10	5	No	No	Yes	No	Yes	No
11	5	Yes	No	No	No	Yes	No
12	5	No	No	Yes	No	No	Yes
13	5	No	No	No	Yes	No	Yes
14	5	No	No	Yes	No	No	Yes
15	4	No	No	Yes	No	Yes	No
16	2	No	No	No	Yes	Yes	No
17	4	Yes	No	No	No	No	Yes
Average/Count	4,12	3	0	10	4	7	10

LS = Likert Scale

SC = Surplus Cash

The analysis tested perceptions around whether or not respondents believed that they were credit constrained. This constraint was tested in two ways, firstly to identify if the respondents felt they were credit constrained and, secondly, to identify if a loan had been applied for and was granted on the terms applied for. We found that four respondents (23,53%) thought they were credit constrained; three of these respondents were also part of the group with the shortest operating history.

In terms of the type of credit rationing experienced, respondents were requested to identify if they were price-rationed, quantity-rationed or risk-rationed. Price-rationed refers to respondents being unwilling to borrow additional finance at prevailing rates or having no need for additional finance; quantity-rationed refers to not meeting the loan requirements and risk-rationed refers to not being willing to accept the contractual risk imposed by lenders.

We found that 11 respondents (64,71%) indicated that they were price-rationed, two respondents (11,77%) indicated that they were quantity-rationed, one respondent (5,88%) indicated that he was risk-rationed and three respondents suggested that they were not credit constrained in any manner. In addition, we found that all but one respondent had applied for a loan or line of credit in the last year, with only two of those being granted the loan on differing terms to the ones applied for. The results are summarised in Table 10 below; please note that the highlighted sections indicate that the respondent chose not to respond.

Table 10: Perceptions About Credit Rationing

Respondents	Credit constrained	Price-rationed	Quantity- rationed	Risk-rationed	Applied for loan last year	Application granted on TAF
1	No	Yes	No	No	Yes	Yes
2	No	Yes	No	No	Yes	Yes
3	Yes	No	Yes	No	Yes	Yes
4	Yes	No	No	Yes	Yes	No
5	No	Yes	No	No	Yes	Yes
6	No	Yes	No	No	No	
7	No	Yes	No	No	Yes	Yes
8	No	Yes	No	No	Yes	Yes
9	No	No	No	No	Yes	Yes
10	No	No	No	No	Yes	Yes
11	No	Yes	No	No	Yes	Yes
12	No	No	No	No	Yes	Yes
13	No	Yes	No	No	Yes	Yes
14	Yes	No	Yes	No	Yes	No
15	No	Yes	No	No	Yes	Yes
16	No	Yes	No	No	Yes	Yes
17	Yes	Yes	No	No	Yes	Yes
Average/Count	4	11	2	1	16	14

TAF = Terms Applied For

4.5. Risk and Risk Mitigation

In earlier chapters it was identified that risk is a major consideration for lenders as it ultimately affects repayment ability, which translates into their profit functions. Further, investors should consider possible rewards in relation to the risks posed and should consider the applicable legislation, like the National Credit Act which guards against reckless lending. These risk factors are based on both hard and soft data, thus it became pertinent to assess respondents' perspectives around risk and how they choose to mitigate against the risks faced by their respective businesses.

Respondents were asked whether they believed they were able to manage/control the risks faced by their respective businesses and, if so, how/why they chose to manage/control these risks. The responses were self-reported i.e. there were no predetermined answers provided. We found that all but one of the respondents believed that they were able to control risk in their business; however, the issues of climate risk and political risk were identified as significant risks which respondents had no control over. In terms of self-reported reasons, a number of common responses were identified. We found that 10 respondents (58,82%) indicated that risk management practices protected the bottom-line while 11 respondents (64,71%) suggested that it assisted in providing safety and improving the planning function of the business. Respondents also suggested that risk management allowed them to protect their reputation and was necessary due to the long production cycle required for seed potato production, although these responses were reported to a lesser degree of importance. The aforementioned responses are summarised in Table 11 below.

Table 11: Risk Management Perceptions

Respondents	Able to control risk	Bottom-line	Safety and Planning	Reputation	Long Production Cycle
1	Yes	Yes	No	No	No
2	Yes	No	Yes	No	No
3	Yes	Yes	No	Yes	No
4	No	No	No	No	Yes
5	Yes	Yes	Yes	No	No
6	Yes	No	Yes	No	No
7	Yes	Yes	No	No	No
8	Yes	Yes	Yes	No	No
9	Yes	Yes	Yes	No	No
10	Yes	No	Yes	No	No
11	Yes	Yes	Yes	No	No
12	Yes	Yes	Yes	No	Yes
13	Yes	Yes	Yes	No	No
14	Yes	No	Yes	No	Yes
15	Yes	Yes	No	No	No
16	Yes	No	No	Yes	No
17	Yes	No	Yes	No	No
Count	16	10	11	2	3

In addition, the authors felt it pertinent to assess respondents' risk attitude and their approaches to risk management. We found that nine respondents (52,94%), five respondents (29,41%) and three respondents (17,65%) indicated that they were respectively risk-neutral, risk-loving and risk-averse. Diversification of operations was identified as a risk mitigation tool to avoid concentration of risk exposures; we found that all respondents engaged in other types of farming business besides seed potatoes. The questionnaire went into more detail and found that the primary reasons for this diversification was largely due to respondents having spare capacity, while some respondents suggested that diversification was the primary reason for engaging in other farming business. Only one respondent indicated that engaging in other farming businesses increased his profit potential. These results are summarized in Table 12 below.

Table 12: Risk Attitude and Approaches to Risk Management

Respondents	Risk Appetite Risk-Averse	Risk Appetite Risk-Loving	Risk Appetite Risk-Neutral	Other farming businesses	Diversification	Profit Potential	Spare Capacity
1	No	No	Yes	Yes	Yes	No	No
2	No	No	Yes	Yes	Yes	No	No
3	No	Yes	No	Yes	No	No	Yes
4	No	Yes	No	Yes	No	No	Yes
5	No	Yes	No	Yes	Yes	No	No
6	Yes	No	No	Yes	No	No	Yes
7	No	No	Yes	Yes	No	No	Yes
8	No	No	Yes	Yes	Yes	No	No
9	No	Yes	No	Yes	No	No	Yes
10	No	No	Yes	Yes	No	No	Yes
11	No	No	Yes	Yes	No	No	Yes
12	Yes	No	No	Yes	Yes	No	No
13	No	No	Yes	Yes	Yes	No	No
14	No	Yes	No	Yes	No	Yes	No
15	No	No	Yes	Yes	No	No	Yes
16	Yes	No	No	Yes	No	No	Yes
17	No	No	Yes	Yes	No	No	Yes
Count	3	5	9	17	6	1	10

The final consideration in terms of risk management centred on the respondents' approach to income protection. A hypothetical scenario was used where respondents were able to hedge their potato income through forward selling or futures contracts, if they would choose to do so, alternatively if they lacked sufficient understanding to engage in such a practice. We found that only two respondents (11,65%) would choose to hedge their income, one respondent (5,88%) suggested he had an insufficient understanding while 14 respondents (82,35%) preferred the open market. Table 13 summarizes the income protection findings.

A further consideration of income protection was the use of crop insurance. We found that farmers do not insure their potato crop as the insurance is only available for hail related damage; hail has a relatively small risk window in the life of a potato plant. The respondents also indicated that this type of insurance is too expensive in its current form. Farmers who engage in other farming businesses indicated that they sometimes insured their maize and onion crops, but not extensively.

Table 13: Perceptions Around Income Protection

Respondents	Fixed Price	Volatility	Insufficient Understanding	Crop Insurance	Too expensive
1	No	Yes	No	No	Yes
2	No	Yes	No	No	Yes
3	No	Yes	No	No	Yes
4	No	Yes	No	No	Yes
5	No	Yes	No	Yes	Yes
6	Yes	No	No	No	Yes
7	No	Yes	No	No	Yes
8	Yes	No	No	Yes	No
9	No	Yes	No	No	Yes
10	No	Yes	No	No	Yes
11	No	Yes	No	No	Yes
12	No	Yes	No	Yes	Yes
13	No	Yes	No	No	Yes
14	No	Yes	No	Yes	Yes
15	No	No	Yes	Yes	No
16	No	Yes	No	No	No
17	No	Yes	No	Yes	Yes
Count	2	14	1	5	14

4.6. Investment Philosophy

Assessing the investment philosophy of the respondents was identified as an important factor for consideration. This was owing to the fact that their respective philosophies would determine how they choose to use available financing mechanisms and the extent of capital flows from rural areas. The questionnaire attempted to identify how each respondent's most recent asset purchase was financed, what the primary purpose of the most recent investment was, whether other farmers' investment decisions are considered and their respective preference to investment choices.

In terms of the respondents' most recent asset purchases, we found that two respondents (11,76%) had used secured debt while eight respondents (47,06%) and nine respondents (52,94%) chose to finance their most recent asset purchases using cash and hire/purchase agreements respectively. Of the respondents that indicated they used hire/purchase methods, we found that two of these respondents used a combination of hire/purchase and cash. Respondents were also requested to identify the primary reason for their asset purchase in terms of: replacement, technology, expansion, efficiency and economies of scale. Many of the respondents indicated that there was not a primary reason; rather, their most recent asset purchases were owing to a combination of these reasons. We found that combinations of replacement, expansion and technology were identified as the most commonly received responses with counts of eleven, seven, and six respectively. These findings are summarised in Table 14 below.

Table 14: Financing of Most Recent Asset Purchase and Reasons

Respondents	Cash	Hire/Purchase	Secured Debt	Replacement	Technology	Expansion	Efficiency	Economies of Scale
1	No	Yes	No	Yes	Yes	Yes	Yes	Yes
2	No	Yes	No	Yes	No	Yes	No	Yes
3	Yes	No	No	Yes	No	Yes	No	Yes
4	No	No	Yes	No	Yes	Yes	No	No
5	Yes	No	No	No	Yes	Yes	No	No
6	Yes	No	No	Yes	No	No	Yes	No
7	Yes	No	No	Yes	Yes	No	No	No
8	No	No	Yes	No	Yes	No	No	No
9	Yes	Yes	No	No	No	Yes	No	No
10	No	Yes	No	No	Yes	No	No	No
11	No	Yes	No	Yes	No	No	No	No
12	Yes	Yes	No	Yes	No	No	No	No
13	Yes	No	No	Yes	No	No	No	No
14	Yes	No	No	No	No	Yes	No	No
15	No	Yes	No	Yes	No	No	No	No
16	No	Yes	No	Yes	No	No	No	No
17	No	Yes	No	Yes	No	No	No	No
Count	8	9	2	11	6	7	2	3

In addition, we found that 11 respondents (64,71%) do consider other farmers' investment decisions prior to making their own. It came to light in the interview process that it is useful to consider others' views and choices only to provide an indication of the available opportunities; ultimately these decisions should be guided by one's intuition. In terms of investing their profits, respondents were asked to rate six possible investment choices on an inverted six-point Likert scale i.e. the value '1' indicated the primary/favoured choice. The analysis considered average scores to provide an indication of how the respondents chose to invest. We found that respondents were focused on expanding or improving their existing businesses; thereafter they considered investing in other agricultural commodities and assets through FSPs, while investing in urban and rural industries was least preferred. Table 15 provides a summary of these findings.

Table 15: Investing Profits

Respondents	Improve business	Expand business	Other Agricultural Commodities	Rural Industries	Urban Industries	Assets through FSPs	Other Farmers' Investment Decisions
1	1	2	6	5	3	4	Yes
2	1	2	3	5	6	4	No
3	2	1	3	5	6	4	No
4	2	1	6	4	3	5	No
5	2	1	3	5	6	4	Yes
6	2	3	6	5	4	1	No
7	3	2	1	5	6	4	Yes
8	1	2	3	5	6	4	Yes
9	3	1	4	6	5	2	Yes
10	1	2					Yes
11	1	2	3	5	6	4	Yes
12	3	1	2	5	6	4	Yes
13	3	2	4	5	1	6	Yes
14	2	1	3	4	6	5	Yes
15	1	2	3	4	5	6	No
16	2	3	5	6	4	1	Yes
17	5	6	1	4	2	3	No
Average/Count	2,06	2,00	3,50	4,88	4,69	3,81	11

4.7. Sustainability Outlook

The sustainability outlook section of the questionnaire attempted to identify what would happen to these respective farming units if the respondents were to retire or if they encountered an unfortunate external event. The analysis used a five-point Likert scale to identify the respondents' perceptions around the areas the authors deemed indicative of sustainability and maintaining productivity of their farming businesses. These areas included: how they would retire; whether they had generated sufficient assets for a comfortable retirement; whether they wanted their business to continue after they retired; whether they wanted to bequeath their business to the next generation; whether they were concerned with capital extraction; whether they planned to be involved in farming post retirement and whether or not they deemed their current farming practices to be sustainable.

We found that the average of responses in each area was greater than 2.5, which implies the respondents are engaging in sustainable practices or at least considering the future of their businesses. We found strong responses in terms of sustainable farming practices currently being employed; however, the crop rotation system required for seed potatoes was found to be a determining factor in this regard. In addition, we found that respondents wanted their respective businesses to continue post-retirement and wanted to bequeath their businesses to the next generation in their respective families. A summary of the results is provided in Table 16, while a full list of responses for each question is provided in Appendix 2.

Table 16: Sustainability Assessment

Indicator	Likert Scale Average
Considered Retirement	4,29
Sufficient Assets for Retirement	3,41
Business Continue Post Retirement	4,47
Business Left for Next Generation	4,06
Concerned with Capital Extraction	3,35
Involved Post Retirement	3,82
Sustainable Farming Practices	4,82

4.8. Additional Areas of Interest Identified in the Interview Process

The interview process yielded additional insight into respondents' perceptions around financial services and how they choose to use various financing mechanisms. Key insights that were revealed included: views on barriers to entry for new entrants; unique financing mechanisms employed; the appropriateness of contracts and contract enforcement; tax planning and management. These unique insights will be explained briefly in the following section.

4.8.1. Barriers to Entry for New Farmers

Respondents were asked whether they thought new entrants would be able to enter the industry. Respondents identified that the market value of land is a major hindrance to entry as it is not relative to production value; in most cases it is assumed that market value is approximately 100% greater than production value. Secondly, the vegetable and fresh produce markets are competitive and staying in business requires economies of scale to justify investment in productivity enhancing technologies. Thirdly, unless one owns assets to post as security or has a 3rd party that is willing to stand as surety, it is incredibly difficult to obtain external finance for working capital and moveable assets.

It was suggested that in the event that one is able to obtain the necessary finance, secure tenure on farmland and has sufficient productive scale, it is important to find a mentor in the industry. The reason for this is that mentors have linkages in the industry that can assist in understanding best practice methods and gaining market access.

4.8.2. Unique Financing Mechanisms

In discussions it was found that the respondents choose to employ unique finance mechanisms to limit reliance on FSPs. Firstly, it was noted that it is not uncommon for property transfers to occur without a financial intermediary under a 'gentleman's agreement'. The reason for this is that involving a FSP requires compliance with overly burdensome administration and it is possibly cheaper to transact without external financiers. This implies that land is transferred once agreed upon milestones are met; these milestones include a deposit requirement, instalments and interest payments in excess of what could be earned as a risk-free rate e.g. a fixed term deposit at a bank.

Secondly, a proportion of respondents with livestock holdings suggested that they view their livestock as a short-term financing mechanism to support their primary seed potato business. They identified that livestock is actively traded, or liquid and, due to the breeding potential, offers returns in excess of any fixed deposit mechanism at a financial institution. In addition, the issues of amending loan structures or obtaining bank approval for short-term financing needs are overcome in this manner.

Thirdly, respondents identified that soft-loans from industry mentors are often used, particularly in the case of a son starting an independent business from that of his father. These loans are the equivalent of a production loan without interest attached and were provided to young farmers by agricultural co-operatives and the Land Bank in the past. Due to changes in legislation, these loans no longer exist as agricultural specific lending becomes more commercialised.

4.8.3. Contract Enforcement

It was mentioned in earlier sections that ‘gentleman’s agreements’ often suffice in the agricultural sector. The reason for this is that farmers have a long-term investment horizon; it is difficult to generate profits in agriculture with a short-term view. When coupled with the fact that rural communities are close-knit, failure to honour an agreement can result in a breach of trust, damage to reputation and consequent losses. In addition, the respondents identified that they value loyalty when doing business and would pay a premium for loyalty with adequate performance. For these reasons, the authors identified that contracting and contract enforcement in the agricultural sector is not a necessity.

4.8.4. Tax Planning and Management

In discussions with farmers, it became evident that tax planning and management are key strategic tools in their businesses. These issues are particularly important for asset investment decisions due to the tax depreciation incentives offered by the South African Revenue Service. Respondents indicated that the tax treatment of an investment is often a deciding factor due to the large capital outlays required when purchasing moveable assets. In addition, farmers plan their entity structure and tax treatment around their respective production years to defer tax until their businesses

are in a cash-positive position. To accommodate these needs, respondents indicated that they employ the services of tax specialists and legal advisors to ensure that the most beneficial outcome is achieved while complying with the necessary legislation.

4.9. Conclusion

This chapter presented the empirical findings of the research questionnaire; some of the salient points are discussed below. It shows that despite the literary assertion that farmers are underserved by FSPs, the respondents all perceived that they had adequate access to various forms of financial services. In addition, we found that loyalty is a key factor in determining which FSP to use, and it is this relationship strength that limits the respondents' willingness to switch FSPs.

In assessing the importance of external finance to farming businesses, we found that external finance reliance is negatively related to business age i.e. it is more important in the early years. As external finance reliance diminishes over time, there is a change in perception about the manner in which it is used. Over time, external finance becomes less of a requirement and more a strategic consideration to leverage potential returns. The respondents noted that in addition to using traditional FSPs and financing mechanisms, there are some unique mechanisms being employed that circumvent the need for financial intermediation. However, there is an underserved financial and transaction advisory need within the sector.

The following chapters of this thesis will discuss these findings in the context of the literary assertions and stated hypotheses identified in earlier chapters. Thereafter, the thesis goes on to make some recommendations for future work in the field and concludes.

5. DISCUSSION

5.1. Introduction

The previous chapters of this study provided insight into pertinent topics for consideration in the realm of agricultural finance. Using available literature, we identified that the provision of financial services to the agricultural industry leaves much to be desired and few bodies of work have analysed these issues from the demand side. This understanding formed the foundation of the assessment into the views expressed by seed potato farmers and whether or not their views are affected by the manner in which they are credit constrained and their use of available financing mechanisms. This chapter serves to draw linkages between the literature and the findings of the study. Further, this chapter will answer the primary research objectives identified in Chapter 1.

5.2. Linking the Findings to the Literature

5.2.1. Adequate Provision of Financial Services

The primary research suggests that farmers have access to the necessary financial services; the average farmer is likely to use: transaction services, overdraft facilities, term-loan facilities; mortgage facilities; crop and asset insurance products; investment advisory services and auditing and assurance services. This is despite the fact that FSPs have withdrawn from small towns, which they now service remotely. The advent of internet banking and related technologies has allowed banks and other FSPs to centralise their offering to rural areas and particularly to farmers.

It was identified that despite the availability of savings mechanisms and hedging products, the respondents in the sample do not frequently use these products. Savings products offer limited return potential and could be restrictive when compared to the use of livestock or an access bond to serve the consumption smoothing function e.g. a fixed deposit offers less liquidity. In terms of income protection products like hedging or forward contracting, we found that these products are not widely used. Apart from the fact that these products are considered too expensive for the risk protection they provide, farmers prefer volatility. Hence, the current offerings are not aligned to the needs of users.

These findings confirm those of Coetzee and Cross (2002) and the SCR that suggested that the presence of commercial banks in rural areas would decline, while the findings in terms of income protection support the SCR assertion of a supply-led financial services market. However, these findings are inconsistent with the sentiment expressed by Miller and Jones (2010) and Piesse et al. (2005) that an increasingly important role would be played by agribusinesses and cooperatives serving as a conduit of funds to rural areas. This is owing to the fact that these FSPs are essentially borrowing from banks, as clients, at a profitable interest rate for the former while then attempting to compete with these same banks in the provision of financial services. In addition, the findings refute the claims by Adesina (2010), Piesse et al. (2005) and Winter-Nelson and Temu (2005) that rural financial markets are underserved and function poorly.

5.2.2. Relationship with FSPs

In the assessment of respondent-FSP relationship strength, it was shown that a historical relationship with a FSP is a stronger determining factor than the best possible terms being offered. We found that 41,17% of respondents indicated that they had considered changing FSPs and 52% indicated that they regularly compare the service offering between FSPs. Despite this, more than 58% of respondents indicated that a change in loan application requirements, interest rates, transaction costs and bank location would not influence their decision(s) to change FSPs. Respondents indicated that relationships were important as they were founded on loyalty and trust. This sentiment was echoed in discussions with FSPs that suggested they consider their clients' needs over the long-term and endeavor to maintain relationships in both good times and bad.

These findings confirm the views expressed by Gloy et al. (2005) and McIntosh et al. (2013) that FSPs do not have an incentive to offer more competitive terms or to improve their service offering. However, the fact that respondents indicated they regularly compare service offerings suggests that it is not due to a lack of competition in rural financial markets. Rather, the failure to switch is a result of an onerous administrative burden and due to non-price factors driving relationship strength. This implies a FSP focus on brokering relationships will yield better results than improving the service offering.

5.2.3. Intermediation Function Provided by FSPs

The respondents' use of overdraft (94,18%), term-loan (64,71%) and mortgage (58,82%) facilities indicate that FSPs are channelling funds between owners and users of capital. Further, an interview with a commercial bank revealed that FSPs are moving towards being self-funded i.e. they are providing an opportunity for depositors to increase returns through appropriate risk assessment and asset allocation. These findings are consistent with Gloy et al. (2005), Fama (1980), Marini 2011 and Cociuba et. al. (2016).

However, unique financing mechanisms like land purchase transactions without the presence of FSPs indicate that these institutions do not necessarily reduce friction and lower transaction costs. Put differently, the intermediary function in rural areas is redundant in some cases. This is owing to the fact that information asymmetries are less of an issue in the agricultural lending environment, due to a greater degree of social cohesion and reputational damage serving as an ex-ante enforcement mechanism. This is consistent with the views expressed by Allen and Santomero (1998), Vandenberg (2003) and Hoff and Stiglitz (1990). Although, as mentioned in the previous sub-section, the latter's views about rural financial markets not operating as competitive markets is inconsistent with the findings of this study.

In addition, respondents identified that the title of 'farmer' is synonymous with 'entrepreneur'. Farmers are required to identify an investment opportunity and manage the related risks in order to maximise profit potential. However, due to the capital-intensive nature of agricultural industry, farmers are required to approach external financiers to assist in funding their respective investment opportunities. Through contract enforcement and the imposition of transaction costs, FSPs are the gatekeepers of entrepreneurial activity; they control asset and information flows. We find that the sentiments conveyed are consistent with the findings of Fama (1980), Boháček (2007), Bokusheva et al. (2009) and Zinych and Odening (2009).

5.2.4. Credit Constrained Farmers

We found that 70,58% of respondents identified that external financing was important to their respective businesses. 58,82% and 41,18% of respondents suggested that external financing was a requirement and a strategic tool respectively. These facts

imply that the majority of respondents place some reliance on external financing, particularly so in the initial years of their business. These facts were further emphasized by 4 respondents with the least operating history indicating that they thought themselves to be credit constrained. Leon (2015) summarised the aforementioned by suggesting that a credit constrained firm has an unmet need for finance, in that it is unable to borrow the required amount of funds or it is able to borrow on terms that differ to those applied for.

However, we must remain cognizant of the fact that investment opportunities cannot be financed solely through external finance for two primary reasons. Firstly, borrowers' failure to assume risk in the transaction creates an incentive to default on loans. Secondly, a borrower's assumption of risk serves as a signalling mechanism to possible financiers that the borrower is in fact a candidate for credit. Discussions with FSPs identified that these institutions offer loan-to-value of 56% implying a 44% deposit requirement to signal credit worthiness and protect the interest of the lender. In the context of a capital-intensive agricultural industry where land, moveable assets and working capital require equal investments, many new entrants fall short on these signalling requirements.

64,71% of respondents did not wish to borrow additional funds at prevailing rates or had no need for additional external finance; consistent with Benjamin and Phimister (2002), some of these respondents expressed the long-term goal of conducting operations on a cash-basis with limited external funding reliance. Boucher et al. (2008) termed this type of credit rationing "price-rationing" where lenders will only provide a positive credit supply if they are able to extend funds at profitable terms. In line with *pecking order theory*, the addition of the lender profit function imposes costs to the borrower who in turn chooses to fund investment opportunities through retained earnings. Kochar (1997) found that internal funding reliance is an indication of credit-constrained firms.

In addition, Daniels (1999) and Vandenberg (2003) suggest that the presence of a lender profit function requires additional resources for screening, monitoring and enforcement efforts to reduce borrower default. The imposition of these costs is to the advantage of larger firms that are able to provide proof of location, post collateral

and keep appropriate business records (Gloy et al., 2005; Kochar, 1997). The findings suggest that all of the respondents are 'large' firms as they are able to satisfy these requirements through fixed business premises, immovable property ownership and the fact that they choose to audit their books for the purposes of accurate business assessment. The sentiments expressed by Fafchamps (1996) that the primary reason for lenders restricting the supply of credit is owing to borrowers not honouring the terms of their respective agreements does not align with the results of this study.

5.2.5. The Pursuit of Productivity Enhancing Agricultural Investments

Jama and Pizzaro (2008), Graeub et al. (2015) and Bradstock (2005) all identify that the productive potential of land, access to water and irrigation, the slow adoption of new technologies and varieties, access to markets and access to credit are factors that restrict farmers from increasing their levels of production. The aforementioned factors, if overcome, are loosely grouped into *productivity enhancing investments* (Boucher et al., 2008). If we ignore the access to credit constraint as this was discussed in the previous sub-section, the respondents all farmed high yielding varieties of seed potatoes under irrigation. Further, the commercial/table proportion of their respective crops is sold on the fresh produce markets while the seed is sold through seed marketing companies. For the purposes of this study, it is evident that the constraints are not binding and we are able to ignore the assertion that farmers are unable to pursue *productivity enhancing investment* strategies.

In terms of the nature of investments pursued, we find that 52,94% of respondents use surplus cash generated to invest in their businesses, while expansion was identified as the most favoured of the defined investment opportunities in a Likert-scale assessment. When asked if they would pursue expansion, invest in new technologies and replace assets we find that respondents indicated their preferences with proportional values of 41,18%, 35,29% and 64,71% respectively. These facts place further emphasis on the fact that seed potato farmers are not exposed to the constraints commonly found in other industries. Respondents' self-identification of their reasons for farming seed potatoes identified income protection and high margins as primary reasons; this aligns with the view that the seed potato industry should be viewed in a different light to other types of farming businesses.

5.3. Implications for Study Hypotheses

This study aimed to provide insight into five distinct areas in the seed potato industry. Firstly, the study aimed to develop an understanding of the general farmer characteristics. Secondly, it aimed to investigate the current environment around farmers' access to credit and to assess the manner in which farmers are credit constrained. Thirdly, to identify the current financing mechanisms employed by farmers and their perceptions in relation to these mechanisms. Fourthly, to assess the type of investment decisions pursued by farmers. Finally, to assess if the manner in which farmers are credit constrained could be used to categorise farmers in terms of signalling efforts. The first of these objectives was satisfied in Section 5.2. of this dissertation, while the remaining four objectives were used to define study hypotheses which will be discussed in turn in the following sections.

5.3.1. Seed potato farmers are not good candidates for conventional bank credit

In comparison to table potato, or commercial potato farmers, seed potato farmers are able to generate higher earnings due to two possible income streams, namely: seed sales at a higher margin and table potatoes at market prices. Higher earnings potential and diversified income streams are positive indicators of repayment ability and risk mitigation efforts. Further, the fact that all but one of the respondents own immovable property (agricultural land) indicates that these farmers are able to provide proof of location and post collateral to assume some transactional risk. These farmers are able to signal their credit-worthiness

In terms of risk management, the farmers identified that they are able to manage the risks faced by their respective businesses; choosing to manage risk protects the bottom-line and aids the planning function within the business. Regardless of their risk attitude, all farmers engaged in other farming businesses due to available capacity, diversification of risk or increased profit potential. Further, the crop rotation system required for disease free seed production ensures that the productive potential of land is maintained.

Present are repayment ability, borrower assumption of risk, and appropriate risk management tools in-line with the long-term view required in the agricultural sector. Accordingly, we are able to refute this hypothesis and confirm that seed potato farmers are good candidates for conventional bank credit.

5.3.2. Farmers are underserved by FSPs resulting in credit rationing

The results indicate that seed potato farmers are not underserved by FSPs. In fact, apart from savings accounts and hedging products, the majority of identified financial services and financing mechanisms are employed in the farmers' respective businesses. Further, in some cases transactions occur without the presence of financial intermediaries. This implies that information asymmetries, resulting in high enforcement costs being imposed on borrowers to ensure repayment, are not necessarily required in the rural financial services environment. This is owing to non-price factors like relationship strength, loyalty and reputational damage acting as *ex-ante* enforcement mechanisms.

We found that despite the fact that farmers perceived that they were not credit-constrained, when asked to identify if they felt that they were price-rationed, quantity-rationed or risk-rationed, only 17,65% of respondents indicated that they experienced no form of credit rationing. Thus, we refute this hypothesis on two fronts. Firstly, seed potato farmers are not underserved by FSPs. Secondly, the credit-rationing experienced by seed potato farmers is not due to information asymmetries and the related enforcement costs.

5.3.3. Farmers are not able to pursue productivity enhancing investments

Respondents indicated that they do pursue *productivity enhancing investment* strategies by expanding operations, investing in economies of scale and adopting new technologies and cultivars. In addition, the fact that all respondents farm under irrigation removes reliance on rain to maintain production. These factors were discussed in greater detail in sub-section 5.2.5 above. It is clear that this hypothesis is refuted as well.

5.3.4. The type of credit-rationing experienced affects perceptions about the available financing mechanisms

In earlier sections of this study, it was shown that of the 17 respondents the majority identified with price-rationing, three respondents indicated they experienced no form of credit-rationing, two respondents identified with being quantity-rationed while one respondent suggested he was risk-rationed. In an analysis of whether or not the use of available financing mechanism differs across these distinct groups, we found that there was no evidence to suggest that credit-rationing had any effect.

This may be owing to the limited sample size and concentration in the industry; however, for the purposes of this study we are unable to confirm that the manner in which a seed potato farmer is credit-rationed has any impact on his perceptions about financing mechanisms or the available financial services offering. Accordingly, we refute this hypothesis and indicate that more data would be required to test this with any significance.

6. RECOMMENDATIONS AND CONCLUSION

6.1. Recommendations

This study identified the various perceptions seed potato farmers have around their experiences with FSPs and the available service offering. Besides sample size issues and the resultant limited power of the data in terms of statistical inference, it must be noted that all of the respondents were at least second-generation farmers. The majority of these farmers have been farming for more than 20 years and suggested that the manner in which they financed their respective entries into the market would no longer suffice as the financing landscape has since changed. Although not significant, respondents identified that financing their entry through mechanisms of 3rd party soft-loans and sureties was a major advantage in establishing their businesses. Through these mechanisms, entering the market was made easier and farmers were not required to take on significant transactional risk in their own names. Their 'insider' status and the flow of information allowed these 3rd parties to understand the risk exposures related to seed potato farming and to be willing to absorb some risk on the entrant's behalf.

Considering information asymmetries in the context of financial services provision and how these issues are potentially overcome in a rural setting through relationship strength and trust, we posit that entry of new farmers i.e. first generation farmers, will not be as easy. New entrants will be subject to the various farmer constraints identified in the literature, including a lack of access to credit and fully functioning financial markets. Expanding intensive agriculture through new entrant development requires an alternative view.

The seed potato industry is a niche market that offers high margins and income protection seldom enjoyed in agriculture. Further, the intensive nature of the industry bodes well for employment creation while the strategic importance of potatoes as a staple food has positive effects for food security. It is evident that the uniqueness of the industry offers both risk management potential and sustainability, which could serve to offer new entrants protection from external factors. In addition, expanding intensive agricultural production could have the positive second round effects of stimulating economic activities in rural areas.

The suggestions of finding an appropriate mentor to assist in management and best practice for new entrants should be considered from both a policy perspective and a FSP perspective. From an FSP perspective, this mechanism will provide new entrants with access to industry experience and linkages that will provide comfort to potential financiers that funds extended are more likely to be used as intended and repaid. This additional assurance provided to lenders has the possibility to reduce default risk and reduce the screening, monitoring and enforcement related costs. Together these factors could translate into profitable loan transactions for FSPs and in turn, as identified, increase the supply of credit as a result.

In terms of policy, we posit that a system of government or developmental finance institution guarantees could overcome the issue of new entrants' inability to absorb risk due to insufficient endowments and resources. In this way, government departments and agencies would perform the function of 3rd party sureties to ensure that new entrants that are likely to be quantity-rationed or risk-rationed, will have access to credit.

In addition, the findings were unable to identify whether it is possible to improve borrower signalling efforts through groupings or typology classification. Financial ratios indicating financial strength were excluded from the study as they are often considered on a case-by-case basis and discussions with FSPs were unable to yield the appropriate benchmarks. It is often the case that a potential borrower identifies that he/she will not meet the requirements of a loan prior to discussing his/her creditworthiness with FSPs. Having a central database of appropriate industry benchmarks could assist borrowers in assessing if they would meet the requirements and should apply to that particular FSP. In this way, borrower signalling is improved while FSP resources are not expended without the corresponding inflow of business.

6.2. Conclusion

Using a qualitative analysis of semi-structured interviews and electronic questionnaires, this study set out to develop an understanding of the demand side perspectives of the available financing mechanisms and FSP service offering in the seed potato industry. The seed potato industry is highly concentrated, thus the use of a convenience sample yielded significant industry representation, albeit with limited powers of statistical inference. In reviewing the relevant literature we found that apart from supply-side bias, previous studies made a number of assertions about the expected perspectives around financial services and the manner in which these are provided to farmers.

These expected perspectives were tested against the findings of the primary research gathered from respondents. Firstly, the research indicates that despite the declining presence of FSPs in rural areas over time, farmers are good candidates for conventional bank credit and adequately serviced by FSPs as a result. Secondly, rural financial markets operate as competitive markets but due to farmers placing importance on factors like trust and loyalty, FSPs are not incentivised to improve their respective service offerings. Thirdly, the intermediary function performed by FSPs is potentially overcome in rural areas through improved flows of information and non-price enforcement. Fourthly, the anticipated increasingly important role to be played by agribusinesses and agricultural cooperatives does not hold in reality, as these institutions are unable to compete with traditional institutions in terms of financial services provision. Fifthly, farmers are evidently credit constrained due to an unmet need for external finance or internal funding reliance. Finally, seed potato farmers are not exposed to the general farmer constraints in other industries and are able to pursue productivity enhancing investment strategies as a result.

In developing future products or services offering, it is potentially more effective for FSPs to consider user needs towards a demand-driven financial services market while more attention needs to be given to the possibilities around hedging and income protection products. The uniqueness of the seed potato industry has the potential to reduce risk and aid new farmers' entry into profitable intensive agricultural production. However, significant work is required to improve policies that encourage entry into the industry through access to financial markets.

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APPENDICES

Appendix 1

MASTERS THESIS SURVEY QUESTIONS

SECTION 1

The following series of questions relates to **general farmer and farming unit descriptive information**.

1. Please state your age:
2. How many years have you been farming?

3. How many hectares do you farm on an annual basis? In addition to your seed potato operation, if you farm other crops/livestock, please specify which crops and the extent thereof.

4. Please state and specify your highest level of education?

5. Are you married?
 Yes
 No
6. Do you have children?
 Yes
 No
7. Please explain why you decided to become a farmer?

8. Please explain why you decided to become a seed potato farmer?

9. Which of the following statements do you find most appropriate in categorizing yourself as a farmer?
 - I enjoy the rural lifestyle and being close to nature and animals
 - I am entrepreneurial and driven to maximize profits in my farming business
 - I want to be recognized as a top performing farmer by my industry peers
 - I am focused on running my farming business as efficiently and as professionally as possible
10. Which of the following best describes how you have chosen to structure your farming unit i.e. legal form?
 - Company – majority equity interest
 - Company – minority equity interest
 - Company – joint equity interest
 - Sole proprietorship
 - Business Trust
 - Partnership

11. Are you a first generation farmer?
- Yes
 - No
12. Which of the following best describes how you **obtained** access to your first piece of land?
- Rented
 - Purchased
 - Inherited
 - Partnered with another farmer
 - Other (please specify)
-
13. Which of the following best describes how you **purchased** your first piece of land?
- I had access to assets sufficient to serve as security
 - I made use of third party standing as surety when applying for a loan
 - I paid cash
 - Other (please specify)
-
14. How did you choose to finance your initial moveable asset purchases? Please choose the most appropriate answer from the list below:
- I had access to sufficient assets to serve as security
 - I made use of surety in applying for a loan
 - I used credit terms from suppliers
 - I paid cash
 - I made use of a term-loan facility from a financial institution
15. How did you choose to finance your initial variable input costs? Please choose the most appropriate answer(s) from the list below:
- I paid cash
 - I used an overdraft facility from a financial institution
 - I was provided a soft loan from a third party
 - I obtained finance through downstream parties within the potato value chain
 - I made use of an off-take agreement to indicate my ability to generate revenues and repay a production loan
 - I obtained finance from a development agency e.g. land bank, Government grant, etc.
 - Other (please specify)
-

SECTION 2

The following series of questions relates to your use of **financial services products** and your **relationship with your financial service providers**.

1. Please indicate which of the following financial services products you presently use in your farming business:
 - Savings Account
 - Transaction Account
 - Overdraft Facility
 - Term-loans
 - Mortgage Loans
 - Investment Advice
 - Crop Insurance
 - Asset Insurance
 - Auditing
 - Hedging/Futures Contracts
 2. How many financial services providers do you use in relation to products identified in 1. above?
 - 1
 - 2
 - 3
 - more
 3. Please state the average length of your business relationship with the financial service providers identified above
-
4. Which of the following best describes your choice of financial service provider?
 - Family historically used this institution
 - Relationship with account manager
 - Most favourable terms and conditions offered
 - Other (please specify)
-
5. Have you considered switching financial service providers?
 - Yes
 - No
 6. Which of the following would result in you considering switching your financial services provider(s)?
 - a change in the interest rate quoted
 - a change in loan application requirements
 - a change in account manager
 - a change in transaction costs
 - a change in bank location
 - improved advisory services offered by a new bank
 7. Do you regularly compare the service offering between your current financial service provider(s) and its competitors?
 - Yes
 - No

8. Would you recommend your current financial service provider(s)?
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree
 9. Are the books of your business audited?
 - Yes
 - No
 10. Considering your response to 9. above, why do you choose to audit your books?
-

SECTION 3

The following series of questions explores the **role of external finance** to your business and whether or not you consider yourself to be **credit constrained**. This section also explores balance sheet strength and financial ratios.

1. External finance is important to my business
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree
2. Which of the following best describes how you consider to use external finance:
 - I do not have sufficient cash resources – it is a requirement
 - I believe my business benefits from the use of external finance – it is a strategic consideration
 - I prefer not to have external financiers involved in my business – it is an indication of poor management
3. Do you consider yourself to be credit constrained?
 - Yes
 - No
4. Which of the following statements is most appropriate in describing why you do not use more credit in your business? Please choose **only one** answer.
 - I have no need for additional external finance or the interest rates offered by credit providers for additional credit is too high
 - I do not think that I will meet the requirements to qualify for the loan amount I desire
 - The collateral/security/surety requirements when applying for credit are too onerous
5. In relation to your farming business, have you applied for any loan or line of credit in the last year?
 - Yes
 - No
6. If your answer to 5. above was yes, was your application approved in-line with the terms you applied for?
 - Yes
 - No

7. If your answer to 5. above was no, please explain why not?
-

8. In considering the financial strength of your business, **please state the following:**

- Debt Ratio (total debt divided by total assets):
- Debt/Equity ratio (total debt divided by total equity):
- Equity Multiplier (total assets divided by total equity):
- Return on Assets (Net Income divided by total assets):
- Current Ratio (current assets divided by current liabilities):
- Interest Cover (earnings before interest and tax divided by interest expense):
- Average Gross Margin (revenue less direct expenses divided by revenue):
- Average Net Margin (revenue less all expenses divided by revenue):
- Quality of cash (cash from operations divided by total revenue):
- Cash ratio (cash + cash equivalents divided by current liabilities):
- Average interest rate experienced:

9. In using the surplus cash your business generates (after paying for direct expenses), which of the following best explains your primary use of cash?

Please choose **only one** of the following:

- Repayment of debt
- Reinvestment in assets for my business
- Investment in personal assets (off-farm)
- Retained to reduce my use of short-term debt
- Distributed to owners

SECTION 4

The following series of questions relates to your **perceptions about the risk** and how you choose to **mitigate risk** in your business. In particular, this section will focus on the financial services products you choose to employ as part of your risk mitigation strategy.

1. Do you believe that you are able to manage/control the risks faced by your business?
 - Yes
 - No
2. If your answer to 1. above was yes, please state **why** you manage/control these risks.

3. If your answer to 1. above was no, please explain **why** you are unable to manage/control your business' risks.

4. In considering investment opportunities, which of the following best describes your attitude towards risk? Choose only one of the following:
- I focus on the upside of a possible investment opportunity
 - I focus on the downside of a possible investment opportunity
 - I consider the upside in conjunction with the downside of a possible investment opportunity
5. Do you engage in other farming businesses besides seed potato farming?
- Yes
 - No
6. If your answer to 5. above was yes, please choose one of the following statements which best describes your reason for doing so?
- I prefer to diversify my income across different commodities i.e. reduces the risk of an unfavourable potato market
 - Planting other crops improves my chances of making more profit
 - I am making use of available capacity in my farming operation
7. Given the opportunity to hedge your income and guarantee a fixed price for your crop, which of the following best describes your preferred course of action?
- I would prefer a fixed price at a stable profit margin
 - I would prefer to take advantage of market fluctuations absorbing the risk of a price decrease
 - I do not know enough about hedging and the related risks
 - I am not aware of hedging products for my farming business
8. Do you use crop insurance?
- Yes
 - No
9. If your answer to 8. above was no, please indicate your reason(s) for not using crop insurance from the following.
- Crop insurance is too expensive
 - There are insufficient crop insurance products available
 - I have used crop insurance in the past and my claim was not handled correctly

10. Please describe how you manage the risks within your farming business?

11. Do you think your business is risky i.e. would you change your profession due to significant volatility and uncertainty in your business?
- Yes
 - No

SECTION 5

The following series of questions relates to the **investment philosophy** exhibited by farmers.

1. How was your most recent asset purchase financed?
 - Cash
 - Hire/purchase
 - Debt
2. In terms of asset investment, which of the following best describes your reason for buying assets/machinery? Please choose only one of the following:
 - Replacing an old asset
 - Taking advantage of new technologies to improve production techniques
 - Required for expansion
 - Required for efficiency
 - Previously restricted by lack of economies of scale
3. When investing the profits your business generates, please rank (in order) the following six investment choices:
 - Invest in improving my business
 - Invest in expanding my business
 - Invest in other agricultural commodities/businesses – diversifying my exposure to agricultural investment
 - Invest in other industries in rural areas
 - Invest in other industries in urban areas
 - Invest in assets through financial institutions e.g. asset managers
4. Do you consider the investments made by other farmers when making your own investment decisions?
 - Yes
 - No

SECTION 6

The following series of questions relates to the **sustainability outlook** of farmers. The sustainability outlook is important in terms of farmers exiting the industry and the effect this has on farming units' productivity.

1. I have considered how I will retire and what will happen to my farming business once I choose to retire
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree
2. I have generated sufficient assets and savings to allow for a comfortable retirement
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree

3. I would like my business to continue after my retirement
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree

4. I want to bequeath my farming business to the next generation
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree

5. I am concerned with extracting my capital out my business
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree

6. I plan to be involved in farming even after retirement
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree

7. I practise sustainable farming techniques to ensure the farm maintains productivity
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree

Appendix 2

	S1Q1A1	S1Q2A1	S1Q5A1	S1Q5A2	S1Q6A1	S1Q11A1
Respondents	Age	Farming Experience (Years)	Married	Married #	Children	First Generation Farmer
1	51	22	Yes		Yes	No
2	66	25	Yes		Yes	No
3	51	11	Yes		Yes	No
4	32	5	Yes		No	No
5	43	9	Yes		Yes	No
6	63	34	Yes		Yes	No
7	52	27	Yes		Yes	No
8	58	34	Yes		Yes	No
9	43	23	No	divorced	Yes	No
10	57	30	Yes		Yes	No
11	61	33	Yes		Yes	No
12	45	23	Yes		Yes	No
13	54	20	No	divorced	No	No
14	37	4	Yes		Yes	No
15	60	30	Yes		Yes	No
16	47	15	Yes		Yes	No
17	54	25	Yes		Yes	No

	S1Q3A	S1Q3A1	S1Q1A2	S1Q1A3	S1Q1A4	S1Q1A5	S1Q1A6	S1Q1A7
Respondents	Hectares Farmed (Total)	Potatoes	Maize	Onions	Carrots	Wheat	Ground Nuts	Pecans
1	617	230	200	17				170
2	580	200	300	80				
3	156	156						
4	600	300	300					
5	461	140	296	25				
6	478	312	144					22
7	260	260						
8	2760	200	1750	60	100	150	500	
9	1429	229	1200					
10	700	700						
11	348	202	80	66				
12	1030	470	100	300				160
13	770	300	400					70
14	120	10	110					
15	36	6	24	6				
16	125	100	25					
17	3150	150	3000					

	S1Q1A8	S1Q3	S1Q3A1	S1Q7A	S1Q7A1	S1Q7A2	S1Q7A3	S1Q7A4
Respondents	Cattle (head)	Highest level of Education	Edulevel	RF Reason for Farming (self explained)	RF Family business	RF Profit	RF Want to farm	RF Rural lifestyle
1		Higher Diploma - Marketing	2	Family business - always wanted to farm	Yes	No	Yes	No
2		MBCHB	3	Family Business - always wanted to farm	Yes	No	Yes	No
3	100	Hons Agriculture (BSc and Ag Econ)	4	Family Business, opportunity arose, passionate about farming	Yes	No	No	No
4		Undergraduate Degree - Economics	3	Family business - high profit potential	Yes	Yes	No	No
5		Matric	1	Family business, opportunity arose, enjoy farming lifestyle	Yes	No	No	Yes
6		Bachelors in Pharmacy	3	Family business - always wanted to farm	Yes	No	Yes	No
7	300	BAgric	3	Enjoy farming lifestyle	No	No	No	Yes
8	300	MSc Agric	5	Family business - always wanted to farm	Yes	No	Yes	No
9		Agricultural College Diploma	2	Family Business - always wanted to farm	Yes	No	Yes	No
10		BPharmacy	3	Family Business - always wanted to farm	Yes	No	Yes	No
11	1000	Hons Agricultural Economics	4	Family Business - always wanted to farm, deep passion for farming	Yes	No	Yes	No
12	1000	BSc Soil Science and Agronomy	3	Family Business - Always wanted to farm	Yes	No	Yes	No
13		Matric	1	Family Business - Always wanted to farm	Yes	No	Yes	No
14	22	Matric	1	Provided opportunity to farm	No	No	No	No
15	500	Agricultural College Diploma	2	Family Business - father passed away	Yes	No	No	No
16	400	BSc Agric	3	Family Business - enjoy the rural lifestyle	Yes	No	No	Yes
17		Bcom	3	Family Business	Yes	No	No	No

	S1Q8A	S1Q8A1	S1Q8A2	S1Q8A3	S1Q8A4	S1Q8A5
Respondents	Reason for Farming Seed Potatoes (self explained)	RP Family business	RP High Value Crop	RP Industry Linkages	RP Interested in Cultivation	RP Risk Protection/Diversification
1	Family business, interested in cultivation	Yes	No	No	Yes	No
2	Family business - more interested in livestock	Yes	No	No	No	No
3	high value crop and linkages in the industry	No	Yes	Yes	No	No
4	High value and technically interesting	No	Yes	No	No	No
5	High value niche market, equity partner presented opportunity	No	Yes	Yes	No	No
6	Family Business	Yes	No	No	No	No
7	high value crop, good seed area, opportunity arose	No	Yes	Yes	No	No
8	High Value Niche Market - protection from market fluctuations	No	Yes	No	No	Yes
9	High value niche market - assistance from established farmers	No	Yes	Yes	No	No
10	Inherited seed business - most profitable out of many crops attempted	Yes	Yes	No	No	Yes
11	High Value Niche Market with less water requirements	No	Yes	No	No	Yes
12	Family Business - provided access to high value niche market	Yes	Yes	No	No	No
13	Family Business - provided access to high value niche market	Yes	Yes	No	No	No
14	Strategic partner farmed seed potatoes, high value crop	No	Yes	Yes	No	No
15	Available capacity and wanted to diversify	No	No	No	No	Yes
16	High margins, well structured industry, prestige	No	Yes	Yes	No	No
17	Family Business - high value crop	Yes	Yes	No	No	No

	S1Q9A1	S1Q10A1	S1Q12A1	S1Q13A2	S1Q13A3	S1Q13A3	S1Q14A
Respondents	Self Categorization as a farmer	Entity Structure	Access to first piece of land	Purchased first piece of land	Purchase #	Purchase # # Agriculture Specific	Financing of initial moveable assets
1	Professional Farmer	Trust	Purchased	Loan	surety	No	Term-loan and cash
2	Committed Environmentalist	Company MI	Inherited	Cash	savings	No	Term-loan
3	Professional Farmer	Company JI	Rented	Loan	mortgage	No	Term-loan
4	Profit Maximiser	Company JI	Rented	Loan	surety	No	Term-loan
5	Committed Environmentalist	Company JI	Purchased	Loan	surety	No	Cash
6	Professional Farmer	Company MI	Inherited	Loan	security	No	Loan - security, Inherited
7	Professional Farmer	Company MI	Rented	Loan	mortgage	No	Term-loan
8	Top Performer	Company MI	Rented	Family arrangement	family arrangement	No	Term-loan
9	Top Performer	Sole Proprietorship	Purchased	Loan	mortgage	No	Term-loan and soft loan
10	Committed Environmentalist	Company MI	Inherited	Security	security	No	Sufficient Assets to post security
11	Professional Farmer	Company MI	Purchased	Loan	mortgage	Yes	Seller provided assets on loan
12	Profit Maximiser	Company MI	Purchased	Loan	mortgage	Yes	Cash
13	Professional Farmer	Business	Purchased	Loan	mortgage	No	Term-Loan facility
14	Profit Maximiser	Company JI	Purchased	Loan	mortgage	Yes	Rented
15	Profit Maximiser	Sole Proprietorship	Rented	Security	security	No	Term-loan facility
16	Professional Farmer	Company JI	Rented	Rented		No	Cash
17	Profit Maximiser	Company MI	Purchased	Loan	mortgage	No	Term-loan

	S1Q14A1	S1Q14A2	S1Q14A3	S1Q14A4	S1Q14A5	S1Q15A	S1Q15A1	S1Q15A2	S1Q15A3	S1Q15A4	S1Q15A5
Respondents	MA Financing Term-loan	MA Financing Cash	MA Financing Soft loan	MA Financing Inherited	MA Financing Rented	Financing of initial working capital	WC Financing Cash	WC Financing Overdraft	WC Financing Soft Loan	WC Financing SCT	WC Financing Co-op
1	Yes	Yes	No	No	No	3rd Party Soft Loan	No	No	Yes	No	No
2	Yes	No	No	No	No	Overdraft facility and supplier credit terms	No	Yes	No	Yes	No
3	Yes	No	No	No	No	Overdraft and Co-operative line of credit	No	Yes	No	No	Yes
4	Yes	No	No	No	No	Cash, overdraft, soft loan, downstream value chain	Yes	Yes	Yes	Yes	No
5	No	Yes	No	No	No	Cash, overdraft, soft loan	Yes	Yes	Yes	No	No
6	No	No	No	Yes	No	Overdraft	No	Yes	No	No	No
7	Yes	No	No	No	No	Overdraft	No	Yes	No	No	No
8	Yes	No	No	No	No	Co-operative loan	No	No	No	No	Yes

9	Yes	No	Yes	No	No	Co-operative input finance	No	No	No	No	Yes
10	Yes	No	No	No	No	Overdraft	No	Yes	No	No	No
11	No	No	Yes	No	No	Soft loan - young farmer co-op loan scheme	No	No	Yes	No	No
12	No	Yes	No	No	No	Overdraft - co-op's were inflexible	Yes	No	No	No	No
13	Yes	No	No	No	No	Overdraft	No	Yes	No	No	No
14	No	No	No	No	Yes	Soft-loan - strategic partner	No	No	Yes	No	No
15	Yes	No	No	No	No	Overdraft	No	Yes	No	No	No
16	No	Yes	No	No	No	Off-take agreement and loan	No	No	No	Yes	No
17	Yes	No	No	No	No	Co-op Facility - production loan	No	No	No	No	Yes

	S2Q1Q1	S2Q1A2	S2Q1A3	S2Q1A4	S2Q1A5	S2Q1A6	S2Q1A7	S2Q1A8	S2Q1A9	S2Q1A10
Respondents	FS Savings Account	FS Transaction Account	FS Overdraft	FS Term-loan	FS Mortgage loan	FS Investment Advice	FS Crop Insurance	FS Asset Insurance	FS Audit Services	FS Hedging/Futures Contracts
1	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
2	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
3	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No
5	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
6	Yes	Yes	No	No	No	No	Yes	Yes	Yes	No
7	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
8	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
10	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No
11	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
12	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No
14	No	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes
15	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
16	No	Yes	Yes	No	No	No	No	Yes	No	No
17	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No

	S2Q2A1	S2Q3A1	S2Q4A	S2Q4A1	S2Q4A2	S2Q4A3	S2Q5A1
Respondents	FS Number of FSP's used	FS Average Length of FSP relationship (Years)	FS Reason for FSP choice	FS Choice Family History	FS Choice Relationship Manager	FS Choice MFT	FS FSP change considered
1	2	15	Family Used Institution/Relationship with Account Manager	Yes	Yes	No	No
2	4	20	Most favourable terms offered	No	No	Yes	No
3	2	11	Relationship with Account Manager - same bank prior to farming	No	Yes	No	No
4	3	5	Most favourable terms offered	No	No	Yes	No
5	4	6	Historical relationship and most favourable terms	Yes	No	Yes	Yes
6	1	15	Most favourable terms offered	No	No	Yes	Yes
7	1	27	Relationship with account manager	No	Yes	No	No
8	4	34	Relationship with account manager	No	Yes	No	Yes
9	2	23	Family historically used the institution	Yes	No	No	No

10	2	15	Relationship with account manager	No	Yes	No	No
11	2	33	Relationship with account manager - most favourable terms offered	No	Yes	Yes	Yes
12	3	23	Family historically used this institution	Yes	No	No	No
13	1	20	Family historically used this institution	Yes	No	No	No
14	2	4	Family historically used this institution	Yes	No	No	Yes
15	4	30	Family historically used this institution	Yes	No	No	No
16	1	12	Relationship with Account Manager	No	Yes	No	Yes
17	2	25	Family historically used this institution	Yes	No	No	Yes

	S2Q6A1	S2Q6A2	S2Q6A3	S2Q6A4	S2Q6A5	S2Q6A6	S2Q7A1	S2Q8A	S2Q8A1
Respondents	RC Change Interest rate	RC Change in loan application requirements	RC Change in account manager	RC Change in transaction costs	RC Change in location	RC Change in service offering	Regular comparison of available FSPs	Recommend current FSPs	LS Recommend current FSPs
1	No	Yes	Yes	No	No	No	No	Strongly Agree	5
2	Yes	No	No	Yes	Yes	No	No	Agree	4
3	No	No	No	No	No	No	No	Agree	4
4	No	Yes	No	No	No	No	No	Agree	4
5	No	Yes	No	Yes	No	No	Yes	Agree	4
6	No	No	Yes	Yes	No	No	Yes	Agree	4
7	No	No	No	No	No	No	No	Strongly Agree	5
8	No	No	Yes	Yes	No	No	Yes	Agree	4
9	No	No	No	No	No	No	No	Strongly Agree	5
10	No	No	No	No	No	No	Yes	Strongly Agree	5
11	Yes	No	No	Yes	No	Yes	Yes	Strongly Agree	5
12	No	No	No	No	No	No	No	Strongly Agree	5
13	Yes	No	Yes	No	No	No	Yes	Strongly Agree	5
14	Yes	Yes	No	Yes	No	Yes	Yes	Neutral	3
15	Yes	No	No	No	No	No	Yes	Neutral	3
16	Yes	No	Yes	Yes	Yes	No	No	Agree	4
17	No	Yes	Yes	No	No	No	Yes	Strongly Agree	5

	S2Q10A	S2Q10A1	S2Q10A2	S2Q10A3	S2Q10A4
Respondents	Reason for Audit Services	RA Business Assessment	RA Statutory Requirement	RA Bank Requirement	RA Accuracy
1	Business Assessment	Yes	No	No	No
2	Perceived statutory requirement	No	Yes	No	No
3	Bank requirement	No	No	Yes	No
4	SARS Compliance	No	Yes	No	No
5	Business Assessment	Yes	No	No	No
6	Historical statutory requirement - continued	No	Yes	No	Yes
7	Business Assessment - accuracy	Yes	No	No	Yes
8	Business Assessment - accuracy	Yes	No	No	Yes
9	Perceived Statutory Requirement - business assessment	Yes	Yes	No	No
10	Ensure proper records are	No	No	No	Yes

	kept - independent review				
11	Ensure proper records are kept for personal assurance and comfort	Yes	No	No	Yes
12	Perceived Statutory Requirement	No	Yes	No	No
13	Business Assessment - accuracy	Yes	No	No	Yes
14	Business Assessment - accuracy, required for loan and government applications	Yes	No	Yes	Yes
15	Bank requirement for loan applications	No	No	Yes	No
16	Good Accounting Practices - accuracy	Yes	No	No	Yes
17	Perceived Statutory Requirement	No	Yes	No	No

	S3Q1A	S3Q1A1	S3Q2A	S3Q2A1	S3Q2A2	S3Q3A1	S3Q4A1	S3Q4A2	S3Q4A3	S3Q5A1	S3Q6A1
Respondents	Importance of External Finance	LS Importance of External Finance	Reason for external finance use	REF Strategic Consideration	REF Requirement	EF Credit constrained	EF Price-rationed	EF Quantity-rationed	EF Risk-rationed	EF Applied for loan/line of credit last year	EF Application granted on terms applied for
1	Neutral	3	Strategic Consideration	Yes	No	No	Yes	No	No	Yes	Yes
2	Neutral	3	Strategic Consideration	Yes	No	No	Yes	No	No	Yes	Yes
3	Strongly Agree	5	Requirement - change to strategic consideration over time	Yes	Yes	Yes	No	Yes	No	Yes	Yes
4	Strongly Agree	5	Strategic Consideration	Yes	No	Yes	No	No	Yes	Yes	No
5	Strongly Agree	5	Requirement	No	Yes	No	Yes	No	No	Yes	Yes
6	Strongly Disagree	1	Requirement	No	Yes	No	Yes	No	No	No	
7	Neutral - changes over time	3	Requirement	No	Yes	No	Yes	No	No	Yes	Yes
8	Strongly Agree	5	Requirement - changes over time	No	Yes	No	Yes	No	No	Yes	Yes
9	Strongly Agree	5	Requirement - missed opportunities if no leverage	No	Yes	No	No	No	No	Yes	Yes

			is used								
10	Strongly Agree	5	Strategic Consideration	Yes	No	No	No	No	No	Yes	Yes
11	Strongly Agree	5	Strategic Consideration	Yes	No	No	Yes	No	No	Yes	Yes
12	Strongly Agree	5	Requirement - particularly expansion	No	Yes	No	No	No	No	Yes	Yes
13	Strongly Agree	5	Requirement	No	Yes	No	Yes	No	No	Yes	Yes
14	Strongly Agree	5	Requirement	No	Yes	Yes	No	Yes	No	Yes	No
15	Agree	4	Strategic Consideration	Yes	No	No	Yes	No	No	Yes	Yes
16	Disagree	2	Strategic Consideration	Yes	No	No	Yes	No	No	Yes	Yes
17	Agree	4	Requirement	No	Yes	Yes	Yes	No	No	Yes	Yes

	S3Q9A1	S3Q9A2	S3Q9A3	S3Q9A4	S3Q8A1	S3Q8A2
Respondents	SC Repayment of L/T debt	SC Repayment of S/T debt	SC Reinvestment	SC Investment (off-farm)	Debt Ratio	Debt/Equity
1	No	No	No	Yes	0,4788	0,9187
2	No	No	Yes	No		
3	No	No	Yes	No	0,5383	1,156
4	No	No	Yes	No	0,47	0,9
5	No	No	Yes	No		
6	No	No	No	Yes	0,1258	0,1439
7	No	No	Yes	No	0,0669	0,0717
8	Yes	No	No	No		
9	No	No	Yes	No	0,0688	0,0739
10	No	No	Yes	Yes	0,1	0,2
11	Yes	Yes	No	No	0,3	0,43
12	No	No	Yes	No	0,15	0,125
13	No	No	No	Yes	0,427	0,443
14	No	No	Yes	No		
15	No	No	Yes	No		
16	No	No	No	Yes	0,05	0,05
17	Yes	No	No	No	0,0171	4,5

	S3Q8A3	S3Q8A4	S3Q8A5	S3Q8A6	S3Q8A7	S3Q8A8	S3Q8A9	S3Q8A10	S3Q8A11
Respondents	Equity Multiplier	Return on Assets	Current Ratio	Interest Cover (Times)	Average Gross Margin	Average Net Margin	Quality of Cash	Cash Ratio	Average Interest Rate%
1	1,92	0,4774	0,1047	2,312	0,42	0,05	0,0983	0,1047	0,105
2			3,02	9,8	0,31	0,145			0,0975
3	2,15	0,26		9,4	0,38	0,1	0,86	1,5	0,105
4	1,97	0,11	6,8	4	0,28	0,03	0	2,5	0,105
5									0,085
6	1,14	0,1146	0,7633	0	0,3923	0,2346	0,2222	0,0858	0
7	1,07	0,0951	17,04	55,51	0,5742	0,2022	0,0387	0,0647	0,095
8				0					
9	1,07	0,0222	38,5405	13,87	0,463	0,1977	0,0525	0,0648	0,105
10	1,2	0,15	1		0,1491	0,0942			0,115
11	1,43	0,1	3,7	6,4	0,41	0,377	0,377	0,86	0,1075
12	1,23	0,15	2,1		0,55	0,12		2,1	0,105
13	1,04	0,235	-0,558	11,2	0,55	0,16	-0,038	0,025	0,1
14									
15									
16	1	5	10	100	0,2	0,1428	0,25	0,25	0,105
17	9,3	0,07	1,14	1,66					0,095

	S4Q1A1		S4Q2Q1	S4Q2A2	S4Q2A3	S4Q2A4	S4Q4A1	S4Q4A2	S4Q4A3
Respondents	Able to control risk	RC Why control risk (self-explained reason)	RC Bottom-line	RC Safety/Planning	RC Reputation	RC Long Production Cycle	Risk Appetite Risk-Averse	Risk Appetite Risk-Loving	Risk Appetite Risk-Neutral
1	Yes	Protect bottom-line	Yes	No	No	No	No	No	Yes
2	Yes	Safety measures, planning implications	No	Yes	No	No	No	No	Yes
3	Yes	High risk business - financial and reputation in jeopardy	Yes	No	Yes	No	No	Yes	No
4	No	Long production cycle - minimal flexibility. Significant political and weather risks	No	No	No	Yes	No	Yes	No
5	Yes	sustainability, maximise profits	Yes	Yes	No	No	No	Yes	No
6	Yes	Planning and controlling value	No	Yes	No	No	Yes	No	No

7	Yes	Protect Investment	Yes	No	No	No	No	No	Yes
8	Yes	sustainability, maximise profits	Yes	Yes	No	No	No	No	Yes
9	Yes	sustainability, maximise profits	Yes	Yes	No	No	No	Yes	No
10	Yes	specialization to reduce farming risk exposure	No	Yes	No	No	No	No	Yes
11	Yes	Sustainability, protect the bottom-line	Yes	Yes	No	No	No	No	Yes
12	Yes	Protect the bottom-line, part of sustainable farming practice, protect natural resources	Yes	Yes	No	Yes	Yes	No	No
13	Yes	Strategic - particularly to limit debt usage	Yes	Yes	No	No	No	No	Yes
14	Yes	Maintain productivity of dry-land asset, borehole water is limited, want to be sustainable	No	Yes	No	Yes	No	Yes	No
15	Yes	Diversification	Yes	No	No	No	No	No	Yes

		- improved cash flow							
16	Yes	limit debt usage, have agreements to uphold	No	No	Yes	No	Yes	No	No
17	Yes	Assists in planning - reduces risk exposure largely due to weather risk	No	Yes	No	No	No	No	Yes

	S4Q5A1	S4Q6A1	S4Q6A2	S4Q6A3	S4Q7A1	S4Q7A2	S4Q7A3	S4Q8A1	S4Q9A1	S4Q10A1
Respondents	Engage in other farming businesses	ROF Diversification	Profit Potential	Spare Capacity	Fixed Price - stable margins	Market Fluctuations - volatility	Insufficient understanding	Crop Insurance	Too expensive (Potato small hail risk window)	Risk perception of farming business
1	Yes	Yes	No	No	No	Yes	No	No	Yes	No
2	Yes	Yes	No	No	No	Yes	No	No	Yes	No
3	Yes	No	No	Yes	No	Yes	No	No	Yes	No
4	Yes	No	No	Yes	No	Yes	No	No	Yes	No
5	Yes	Yes	No	No	No	Yes	No	Yes	Yes	No
6	Yes	No	No	Yes	Yes	No	No	No	Yes	Yes
7	Yes	No	No	Yes	No	Yes	No	No	Yes	No
8	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
9	Yes	No	No	Yes	No	Yes	No	No	Yes	Yes
10	Yes	No	No	Yes	No	Yes	No	No	Yes	Yes
11	Yes	No	No	Yes	No	Yes	No	No	Yes	No
12	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	No
13	Yes	Yes	No	No	No	Yes	No	No	Yes	Yes
14	Yes	No	Yes	No	No	Yes	No	Yes	Yes	No
15	Yes	No	No	Yes	No	No	Yes	Yes	No	No
16	Yes	No	No	Yes	No	Yes	No	No	No	Yes
17	Yes	No	No	Yes	No	Yes	No	Yes	Yes	No

	S5Q1A1	S5Q1A2	S5Q1A3	S5Q2A1	S5Q2A2	S5Q2A3	S5Q2A4	S5Q2A5
Respondents	MRAP Cash	Hire/Purchase	Secured Debt	Reason replacement	Reason technology	Reason expansion	Reason efficiency	Reason previously restricted by lack of economies of scale
1	No	Yes	No	Yes	Yes	Yes	Yes	Yes
2	No	Yes	No	Yes	No	Yes	No	Yes
3	Yes	No	No	Yes	No	Yes	No	Yes
4	No	No	Yes	No	Yes	Yes	No	No
5	Yes	No	No	No	Yes	Yes	No	No
6	Yes	No	No	Yes	No	No	Yes	No
7	Yes	No	No	Yes	Yes	No	No	No
8	No	No	Yes	No	Yes	No	No	No
9	Yes	Yes	No	No	No	Yes	No	No
10	No	Yes	No	No	Yes	No	No	No
11	No	Yes	No	Yes	No	No	No	No
12	Yes	Yes	No	Yes	No	No	No	No
13	Yes	No	No	Yes	No	No	No	No
14	Yes	No	No	No	No	Yes	No	No
15	No	Yes	No	Yes	No	No	No	No
16	No	Yes	No	Yes	No	No	No	No
17	No	Yes	No	Yes	No	No	No	No

	S5Q3A1	S5Q3A2	S5Q3A3	S5Q3A4	S5Q3A5	S5Q3A6	S5Q4A1
Respondents	LS Improve business	LS Expand business	LS Other Agricultural Commodities (diversification)	LS Rural Industries	LS Urban Industries	LS Assets through FSPs	Consider Other Farmers' Investment Decisions
1	1	2	6	5	3	4	Yes
2	1	2	3	5	6	4	No
3	2	1	3	5	6	4	No
4	2	1	6	4	3	5	No
5	2	1	3	5	6	4	Yes
6	2	3	6	5	4	1	No
7	3	2	1	5	6	4	Yes
8	1	2	3	5	6	4	Yes
9	3	1	4	6	5	2	Yes
10	1	2					Yes
11	1	2	3	5	6	4	Yes
12	3	1	2	5	6	4	Yes
13	3	2	4	5	1	6	Yes
14	2	1	3	4	6	5	Yes
15	1	2	3	4	5	6	No
16	2	3	5	6	4	1	Yes
17	5	6	1	4	2	3	No

	S6Q1A1	S6Q2A1	S6Q3A1	S6Q4A1	S6Q5A1	S6Q6A1	S6A7A1
Respondents	LS Considered Retirement	LS Generated Sufficient Assets for Comfortable Retirement	LS Business to Continue Post-Retirement	LS Business Left for Next Generation	LS Concerned with Extracting Capital	LS Involved in Agriculture Post-Retirement	LS Practice Sustainable Farming Techniques
1	5	4	5	5	5	4	5
2	3	4	4	2	4	4	5
3	5	3	5	5	1	5	5
4	2	1	3	3	5	3	5
5	5	1	5	5	3	4	5
6	5	5	5	5	3	4	5
7	5	5	5	4	3	4	5
8	4	2	5	4	5	4	5
9	5	4	5	5	2	3	5
10	5	4	4	3	3	5	5
11	5	5	5	5	1	4	5
12	5	5	5	5	4	5	5
13	4	4	4	2	2	2	4
14	3	1	3	5	5	3	5
15	4	4	5	5	3	4	4
16	4	2	4	3	4	4	5
17	4	4	4	3	4	3	4