

Supply Chain Finance: Improving the efficiency of the table grape industry – A case study

by
Charl Müssmann

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Supervisor: Prof. Johannes Jacobus Louw

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ABSTRACT

“Within the context of the current market conditions, SCF may be one of the most attractive tools for companies to diversify funding basis, enrich and solidify their relationships with suppliers and their core banks.” – Michiel Steeman (Executive Director – Supply Chain Finance Community). (ING Group, 2013b).

Insufficient cash flow is one of the major reasons for business failure in the current business environment. The spotlight is on collaboration between supply chain management and finance to release tied up cash in supply chains. Supply Chain Finance is a financial tool to help improve cash flow and optimise working capital to operate more efficiently. South Africa is one of the leading fruit exporters in the world with complex supply chains and even more complex financial arrangements. The need for Supply Chain Finance is aggravated by the long distances to overseas markets, and thus the long delay in payments after goods have been shipped. Supply Chain Finance is beneficial to the supplier, buyer and the financial service provider, creating a win-win-win situation. During this research the table grape export supply chain of Denau Farming is investigated to develop an explorative case study to implement Supply Chain Finance into their business model.

During the research the problem of late payment received by buyers is explored by means of interviews and existing literature. A Concept Model is developed by adapting the Supply Chain Operations Reference Model (SCOR®) and the Management for Supply Chains (M4SC™) framework to identify the supply chain strategy during the current as-is physical and financial flow and to identify the gap in the supply chain. Two Supply Chain Finance solutions are identified based on Denau Farming’s financial needs in order to develop the to-be physical and financial supply chains and the resource changes required to facilitate the respective implementation. The final result determines how the proposed Supply Chain Finance solutions affect the expected cash-to-cash cycle time and the expected Economic Value Added (EVA®) in the case study.

OPSOMMING

“Within the context of the current market conditions, SCF may be one of the most attractive tools for companies to diversify funding basis, enrich and solidify their relationships with suppliers and their core banks.” – Michiel Steeman (Executive Director – Supply Chain Finance Community). (ING Group, 2013b).

Onvoldoende kontantvloei is een van die vernaamste redes waarom besighede in die huidige sake-omgewing misluk. Die kollig val op samewerking tussen voorsieningskettingbestuur en finansiering om kontant wat vasgevang is in voorsieningskettings te kan vrystel. Voorsieningsketting-finansiering is 'n finansiële instrument wat kan help om kontantvloei verbeter en bedryfskapitaal te optimeer om meer doeltreffend te bedryf. Suid Afrika is een van die voorste vrugte-uitvoerders in die wêreld met komplekse voorsieningskettings en nog meer komplekse finansiële reëlings. Die behoefte vir voorsieningskettingbestuur-finansiering word vererger deur die lang afstande na oorsese markte, en dus die lang vertraging vir betaling nadat goedere reeds verskeep is. Voorsieningsketting-finansiering is voordelig vir die verskaffer, koper, en die finansiële diensverskaffer deur die skep van 'n wen-wen-wen situasie. As deel van hierdie navorsing is die tafeldruif-uitvoer voorsieningsketting van Denau Boerdery ondersoek as deel van die ontwikkeling van 'n verkennende gevallestudie om sodoende voorsieningsketting-finansiering in hul sake-model te implementeer.

Tydens die navorsing is die probleem van laat betaling ontvang vanaf kopers in oorsese markte verder ondersoek deur middel van onderhoude en bestaande literatuur. 'n Konsep model is ontwikkel deur die toepassing en aanpassing van die Supply Chain Operations Reference Model (SCOR®) en die Management for Supply Chains (M4SC™) raamwerk beginnende met die identifisering van 'n voorsieningskettingstrategie tydens die huidige fisiese en finansiële vloei en die begin van 'n gapings-identifisering vir die voorsieningsketting. Twee voorsieningsketting-finansiering oplossings is geïdentifiseer gebaseer op Denau Boerdery se finansiële behoeftes en die ontwikkeling van 'n verwagte toekomstige fisiese en finansiële voorsieningsketting asook die hulpbronveranderinge benodig wat die onderskeie implementerings kan help fasiliteer. Die finale navorsingsresultate bepaal tot watter mate die voorgestelde voorsieningsketting-finansiering oplossings die verwagte kontant-tot-kontant siklustyd asook die verwagte Ekonomiese Waarde Toevoeging (EVA®) in die gevallestudie beïnvloed.

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Chapter 1: Introduction

1.1 Introduction and Background

The focus of supply chain management to date has been on the optimisation and the design of the flow of goods and information, but the financial flows in the supply chain are often neglected from a supply chain management perspective (More & Basu, 2013). Ever since the financial crisis in 2008 the development of Supply Chain Finance has increased dramatically. Initially it was developed for small and medium sized enterprises that were in financial difficulty, but more often large multinational organisations has seen the great potential Supply Chain Finance can unlock (Betts, 2013).

Supply Chain Finance was developed as an initiative to create working capital in the form of cash flow and to act as an alternative to financing from banks with high interest rates. During the economic downturn a lot of organisations had difficulty generating cash flow in the short term, to optimise working capital and mitigating the risks involved with financing (Citibank, 2013).

The financial flows from accounts receivables, inventory and accounts payables are the working capital. To optimise the working capital means to reduce the accounts receivables and to reduce the inventory, and to delay the accounts payables (Tavan, 2012). Without an adequate amount of cash flow companies won't be able to run operations and could face operation downtime. This type of financial constraint can lead to a major loss in profit or even in the worst case scenario bankruptcy. Supply Chain Finance (SCF) was developed to overcome these problems and can be used as an alternative cash generating tool.

The table grape industry faces the same challenges due to their complex supply chains. The long time that table grape producers wait for payment from buyers in foreign countries are placing financial pressure on them to operate efficiently and to meet obligations. The high costs that incur during the time that producers wait for payment is the main constraint towards operating efficiently.

Much of literature states that SCF has a positive impact on all parties involved in that particular supply chain, i.e. suppliers, buyers and financial service providers. The magnitude of the benefit that is enjoyed by each party involved depends on different factors. Some of these factors are the type of SCF model used, the level of collaboration between supply chain partners, and the extent to which supply chain partners follow the same strategy.

Banks have started to support SCF options since it improves their business profitability (Tavan, 2012). SCF builds customer relations and the bottom line is also improved by supporting customers' entire supply chain from end-to-end (CGI Group, 2007). The advantages for the buyers include the reduction of the cost of goods purchased and reduce working capital requirements through improved days payables outstanding (DPO). The seller also enjoys advantages making use of SCF in the form of a reduction in the cost of capital through improved days sales outstanding (DSO) and lower finance costs. One of the main reasons why suppliers should make use of SCF programs is the flexible and predictable cash flow they are able to generate (CGI Group, 2007).

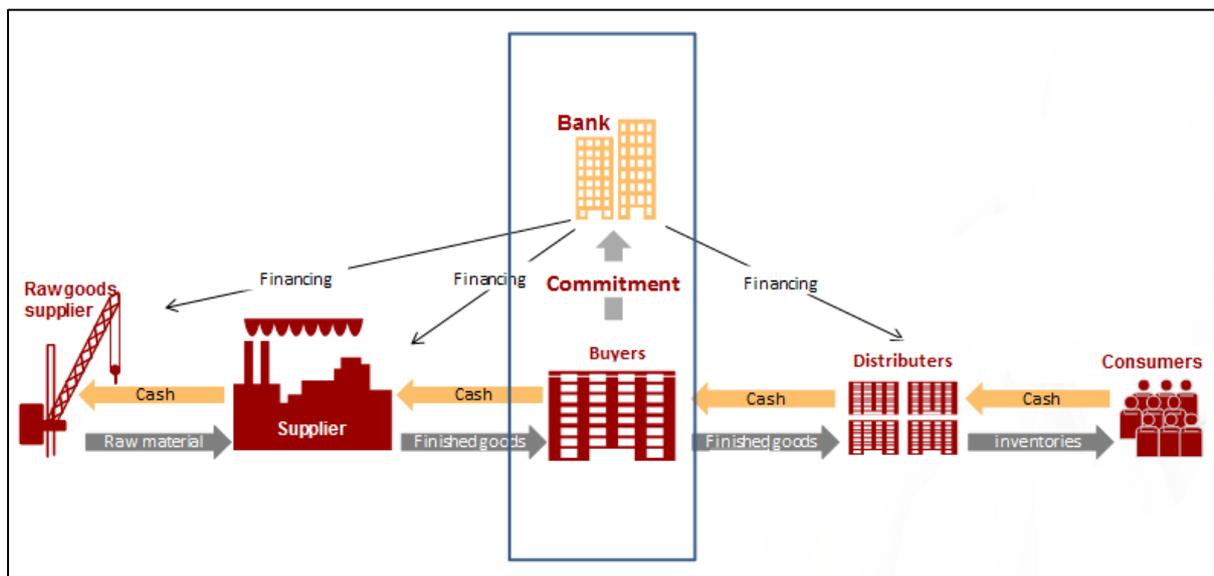


Figure 1.1: Basic Supply Chain Finance Model

Source: Cool Connection, 2013.

Figure 1.1 is a graphical illustration of a basic SCF model. SCF started as a basic model where every party in the supply chain wants a stable and predictable flow of goods, raw materials and cash. The bank or financial service provider finances the raw goods supplier and the distributor while the key of using this model is the commitment of the buyer to the financial service provider in order to leverage purchasing power and credit quality (Cool Connection, 2013).

Since SCF is a fairly new concept in developing countries like South Africa, an in depth literature review is done. All of the different SCF models will be examined to give the author an understanding of how each model works. The advantages and limitations of implementing SCF are explained. The magnitude of working capital requirements of table grape producers to finance their own exports is examined. Observations are made on Denau Farming to investigate their table grape export supply chain to develop an in depth explorative case study. The final part of the literature review explains the relationship between cash-to-cash cycle time and Economic Value Added (EVA®).

A concept model is developed by adapting the Supply Chain Council's Management for Supply Chains (M4SC™) framework and their Supply Chain Operations Reference Model (SCOR®) to implement SCF into a table grape farmer's business model. The goal is to use the adapted SCOR® cash-to-cash cycle time metric as a key performance indicator to identify the gap in the supply chain and to propose two SCF models to overcome the gap in the supply chain.

A case study is then developed of Denau Farming to identify how they currently operate in terms of physical and financial flow. The Concept Model forms part of the case study and acts as a framework in which Denau Farming's strategy is analysed and how their to-be processes will look after implementation. A final conclusion is made on the expected effect that the SCF models will have on the cash-to-cash cycle time and EVA®.

1.2 Problem Statement

Most of the table grapes produced in South Africa are exported while only a small percentage of the production is available on the domestic markets (Department of Agriculture, Forestry & Fisheries, 2012). The table grapes that are exported are shipped by sea and take on average 23 days to arrive at the destination without the occurrence of congestion or breakdowns, while the payment terms usually vary from 30-120 days but are negotiable (Louw, 2014). This delayed payment leads to a shortage of cash flow and working capital and can lead to temporary downtime or, in a worst case scenario, bankruptcy.

SCF is still a new concept for many organisations and after the research the reader's knowledge and understanding of the term may be broadened. Previous research that has been conducted shows the opportunities and benefits that SCF can release throughout the whole supply chain (Tavan, 2012). There are currently no industry standards, corresponding terminology or any set definitions for SCF that is recognised. This makes it difficult to measure the efficiency of using SCF and makes it more complex to negotiate during international trade.

The main problem identified is how the lack of SCF creates inadequate cash flow through the table grape supply chains in the short term. Implementing SCF into the different table grape supply chains have the ability to improve cash flow and lead to more efficient operations. Providing the customer with better payment terms and straightforward payment options can increase cash flow within table grape supply chains (Global Business Intelligence, 2012).

Suppliers are facing pressure from large buyers abroad who are demanding extended payment terms (Global Business Intelligence, 2012). Extending the payment terms given to large buyers can

have a very positive impact on their profit and loss statement and balance sheet, but at the same time put pressure on other parties in the supply chain and potentially disrupt the flow of goods.

There are various organisations that are having difficulty with achieving optimal working capital levels (Casterman, 2013). Various table grape farmers are experiencing insufficient working capital due to the late payment received by the buyer after shipment and at the same time the high operating costs (Louw, 2014)

Tavan (2012) did research on the benefits that SCF can have on organisations' financial statements. Similar research on the effect of SCF on the business environment of table grape farms has not been done. This has left much room for research to be done on the combination of supply chains and finance.

1.3 Research Goals and Objectives

The main research goal is to investigate table grape supply chains' working capital positions with the focus on SCF as a possible solution towards inadequate working capital and generating cash flow. The main research question is formulated because farmers are receiving late payment from buyers because of the complexity and length of the supply chains. Working capital of table grape farmers is jeopardised when receiving late payment and can financially constrain them. The second most important goal of the research is to understand the difference in cash-to-cash cycle time of table grape supply chains when a farmer is making use of SCF and when a farmers is not making use of SCF. The Supply Chain Operations Reference (SCOR[®]) framework will be used to calculate cash-to-cash cycle time.

During this study performance measurements for SCF will be identified using the SCOR[®] model and the M4SC[™] framework developed by the Supply Chain Council. The appropriate SCOR[®] metric(s) will be identified while the M4SC[™] framework will be adapted to emphasise the implementation of SCF. The aim is to develop a Concept Model from the SCOR[®] and M4SC[™] frameworks in order to be able to measure the performance of individual table grape supply chains before and after SCF has been implemented.

The reason for conducting this research is to work with table grape farmers, banks, financial service providers, and 3PL's to gather information on how to optimise the working capital management of table grape producers.

It is important to understand what SCF solutions are available to table grape farmers that will satisfy their financing needs. The goal is to examine all available SCF solutions and to describe how each of them works in practise.

A key goal is to develop a case study to investigate the current financial supply chain. A case study is developed of Denau Farming which includes identifying the current financial flow and the time it takes to receive payment from buyers. The adapted M4SC™ framework forms part of the case study and serves as a framework to implement a possible solution that will improve cash flow and release tied up capital in the supply chain. The reason for developing a case study is to describe the current physical and financial supply chain in detail with the focus on the timeliness of payment received from buyers and to obtain a practical understanding of the financial problems.

Two possible SCF solutions will be implemented into Denau Farming's business model and the effect on Economic Value Added (EVA®) will be analysed. The goal is to determine how Denau Farming's business environment will change from a supply chain perspective and how the cash-to-cash cycle will be affected after the implementation of the proposed SCF solutions.

It is important to involve the appropriate stakeholders in the study to get the most insight into the supply chain from both a financial and supply chain perspective. The research outcomes, results and recommendations on SCF solutions will be shared with stakeholders and organisations that have provided information and data to conduct the research. It will however be done in a confidential manner. This will ensure their support and uptake in the future. The stake holders include table grape farmers, export agents, logistics service providers, and other service providers (financial, legal and IT).

It is important to acknowledge the significance of the study and that it is potentially a catalyst in making the table grape industry in South Africa more efficient. The table grape industry in South Africa plays an important role in South Africa's economy and this thesis should form the basis for future research.

Objectives are means of reaching the research goals and show how you will achieve your goals. The main objective is to identify how table grape supply chains are currently operating in terms of their financial flow and financial needs. Interviews with the appropriate supply chain partners are important in reaching this objective. Part of the main objective of the research is to identify the extent to which Denau Farming is making use of the available resources to generate cash flow.

It is not clear to the researcher if any form of SCF is currently being implemented in the table grape supply chains. It is thus one of the research objectives to identify how and if any form of SCF is being implemented currently.

The importance of efficiency of the table grape supply chains are emphasised during the research. The SCOR® model will serve as a guide to measure the efficiency of the table grape supply chains before and after SCF has been implemented. The adapted Management for Supply Chains (M4SC™) is used to identify a gap and to find a solution to the gap. The objective is thus to define and measure the performance of Denau Farming's table grape supply chain after the concept model is developed.

It is important that all the necessary literature is incorporated into the concept model. The objective is to combine the existing literature with the M4SC™ and SCOR® frameworks as well as SCF models in order to develop a fluent and thorough concept model that emphasize supply chain management and finance.

It is important to not only focus on the financial effect SCF has on an organisation, but to identify the effect it has on the business structure as a whole. The objective is to simulate the effect the proposed SCF models will have on Denau Farming's business structure by means of the concept model.

In order to disseminate the results with the individuals that form part of the research the thesis will be shared by providing them with an electronic copy and to set up focus groups that consist of all participants of Denau Farming's supply chain. The focus will be to take knowledge from the literature and connect it with real life application in terms of SCF implemented into individual table grape supply chains. Case studies will serve as practical examples of the different table grape supply chains' physical and financial flow. The case studies serve as a mean towards measuring the performance of the different table grape supply chains. Table 1.1 is a summary of all the major goals and objectives:

Table 1.1: Deduction of Major Goals & Objectives.

Goals	Objectives
Goal 1: Investigate table grape supply chains' working capital positions with SCF as a possible solution to solve the problems related to late payment from buyers.	Objective 1: Identify how table grape supply chains are currently operating in terms their financial flow and financial needs.
Goal 2: Analyse the extent to which SCF affects the cash-to-cash cycle time and EVA®.	Objective 2: Identify the extent to which Denau Farming is making use of the available resources

	to generate cash flow.
Goal 3: Develop a concept model, based on SCOR® and M4SC™, to act as a framework to identify a gap in the supply chain and implement SCF.	Objective 3: Define and measure the performance of Denau Farming’s table grape supply chain after the concept model is developed.
Goal 4: Get an understanding of the available SCF solutions and how each solution works.	Objective 4: Identify if any form of SCF is being implemented into Denau Farming’s business structure currently.
Goal 5: Develop an in depth exploratory case study of Denau Farming’s table grape supply chains.	Objective 5: Combining existing literature with the Supply Chain Council’s SCOR® and M4SC™ frameworks as well as SCF.
Goal 6: Identify how the business environment of Denau Farming will change after the implementation of SCF.	Objective 6: Simulate the implementation of the proposed SCF models into Denau Farming’s business structure.

1.4 Research Questions

1.4.1 Main Research Question

The main research question is the single question that raises the gap in the existing body of knowledge and in order to fulfil the research goals the main research question must be answered:

- To what extent does SCF serve as a solution towards generating cash flow and relieving inadequate working capital for individual table grape export supply chains?

1.4.2 Sub Research Questions

The sub research questions serve as catalysts to answer the main research question. The research sub questions are just as important as the main research question.

Efficiency

- How is efficiency defined in terms of SCF?
- How will efficiency be measured?

Data & Information

- What data will be required to measure efficiency?
- How will the data be gathered?
- What literature will be required to develop the concept model?

Measurement

- What metrics will be used to measure efficiency?
- What methods will be used to measure efficiency of the table grape supply chain?

Explorative

- Who is responsible for the financing of each individual process in the supply chain?
- To what extent is finance a constraint to table grape farms being efficient?
- Is there currently any form of SCF in the structure of Denau Farming?
- How will the business environment of Denau Farming change after implementing SCF?
- To what extent does SCF change Denau Farming's cash-to-cash cycle time?

1.5 Expected results

It is difficult to determine what the final results of the research are going to deliver. The uncertainty of the outcomes is a result of the limited research that currently exists in the field of study, in particular the table grape industry. The answer on the main research question will give a good reflection on what the expected results are after the research is done.

It is expected that SCF will be beneficial to the buyer, supplier and bank or financial service provider. This expected result is deviated from existing literature on the advantages of SCF on the whole supply chain and not only on certain individuals in the supply chain.

The next expected result is that some form of control over the upstream supply chain will be achieved by giving supply chain partners more beneficial financing options. By giving suppliers more beneficial financing options and increasing collaboration it is expected that relationships among supply chain partners improves.

Various existing literature claims that SCF makes working capital more optimal and thus it is expected that working capital will be optimised after SCF is implemented. This means that working capital is optimised by managing receivables, payables and inventory more efficiently. Tavan (2012) stated that SCF is advantageous for the supplier, buyer and financial service provider, however it is expected that the supplier and the financial service provider will benefit the most from SCF.

The cash-to-cash cycle time of Denau Farming is expected to reflect the long lead time of exporting table grapes to Europe. Although the financial statements and the cash-to-cash cycle time is not calculated after implementing SCF it is expected that it will optimise working capital. One of the

characteristics of SCF is that the supplier receives payment from buyers much earlier and thus has a direct effect on cash-to-cash cycle time.

The expected effect that SCF will have on Denau Farming's economic profit will be investigated. This expectation is based on research that Bolek *et al.*, (2012) did on the correlation between cash-to-cash cycle time and EVA®.

The concept model is developed only as a framework to incorporate into an organisation. It is not expected to provide the same results and conclusion each time. It is also expected that the benefits of the SCF model will be variable based on the maturity of the table grape producer. Since Denau Farming is reaching maturity the benefits will be somewhat smoothed.

It is expected that after the case studies have been developed that Denau Farming's financial supply chain will be optimised. It is also expected that the proposed solutions to improve cash flow may not be the best in class.

1.6 Scope and Limitations

The scope of the study consists of Denau Farming and other supply chain members and service providers in the Hex River Region. The reason for choosing the Hex River Region and particularly Denau Farming to be the centre point of the research is that the Hex River Region is the largest table grape producing region in South Africa with key players in the table grape industry to provide significant results and conclusions (SATI, 2012).

The main limitation that can affect the quality of the thesis is the willingness of the participating parties to share information. Some of the information used is sensitive and are unique to some organisations and sharing this information can lead to organisations losing their competitive advantage. If the stakeholders or participants that take part in the research are unwilling to share data or information the quality of the results will be influenced. One of the mitigation strategies is to sign a confidentiality contract to not share sensitive information that can influence their business.

The part of the study that will be completed with great difficulty is to compare the proposed SCF solutions with one another. The difficulty rises from defining the cash-to-cash cycle time and consequently to generate relevant results. It will also be difficult to quantify the cash-to-cash cycle time of each SCF solution because of the difficulty to simulate figures into the financial statements.

There are currently no key performance indicator benchmarks for SCF to compare the table grape supply chains against. There are also no benchmarks for the cash-to-cash cycle time of table grape supply chains.

The lack of knowledge of the farmers during the gathering of data and information to complete the adapted M4SC™ model can lead to limiting the accuracy of the metrics used and information required. The lack of standard terms and definitions of SCF makes it difficult to communicate with participants that do not have any knowledge of the study field. The questions answered during semi-structured interviews may be answered inaccurately because of the lack of knowledge.

When conducting this research it is important to understand the nature of possible negative impacts on the stakeholders and to identify options for preventing or minimising these negative consequences from happening. It is firstly important to state that it is not possible for the researcher to identify all the risks involved with implementing the proposed SCF solutions in a supply chain or business model since not one supply chain is identical.

There is an existing risk once the study is completed that stakeholders will implement one of the SCF models and that it will have a negative impact on their working capital. To minimise the chance of this happening, different financing options should be implemented in hypothetical case studies to identify potential risks from occurring. It is also advised to consult with financial experts before making any decisions.

It is critical that an adequate communication strategy is in place to inform stakeholders of the risk once identified. For optimal risk management it is important to align with other primary constraints i.e. scope, time, cost, quality. The contingency plan is identified in table 1.2 and will be managed as described.

Table 1.2: Contingency Plan.

Contingency plan for SCF implementation failure	
Failure scenario	SCF does not generate cash flow in the supply chains and thus does not optimise working capital and the cash-to-cash cycle time.
Implementation trigger	Poor response time to achieve target on financial statements or financial ratios, or greater financial stress on suppliers to deliver goods on time and in the correct quantity.
Contingency option	Use alternative SCF solution or alternative source of financing.
Contingency plan	Re-evaluate current source of financing and implement different SCF

	solution.
Learning points	Enough time must be given to evaluate, test and implement the different SCF solutions ranked in terms of preference. Preferences may be based on the total amount of working capital that can be released, optimising the return on investment or certain financial ratio goals. During implementation involve as much expertise from all business functions as possible.

1.7 Limitations in the Existing Body of Knowledge

SCF is still a fairly new concept in developing countries like South Africa. Recently a lot of research on the topic has been done, but the implementation in the table grape industry has not seen much attention. Theory on how SCF creates a win-win-win (buyer, supplier and financial institution) situation is still to be proved in table grape supply chains (ING Group, 2013b).

Export table grape supply chains are complex in nature and the financial sector has not developed to compensate for the complexities in recent years (Department of Agriculture, Forestry & Fisheries, 2012). It is unclear whether SCF will generate the cash flow required for table grape producers to run efficiently and/or even escape bankruptcy during financial difficulty.

There is not enough evidence to prove that SCF will make the entire table grape supply chain more efficient or whether only some of the organisations that forms part of the supply chain will enjoy the benefits.

The main problem is that the farmers' cash-to-cash cycle is too long to run operations optimally and efficiently without being financed. There is uncertainty of the effect that SCF will have on the different supply chain partners and the downstream effect from production until consumption.

There is not an existing framework to measure the performance of the financial supply chain with the focus on supply chain management. This gap in the existing body of knowledge will be overcome by creating a concept model that can be used to identify the gap in the physical and financial supply chain by using SCOR[®] metrics and to identify solution(s) to overcome the gap.

1.8 Structure of the Thesis

The research consists of various chapters and sections that are directed to the final result, with flow and fluency incorporated. Chapter 2 will discuss the methods and techniques used to conduct the research and the overall flow of the research. This chapter will include the data and variables used to complete the research.

In Chapter 3 the term SCF is defined and the advantages and limitations are identified. This chapter will include a background of the table grape export process that focused on the whole supply chain, from farm to end customer. This chapter also gives a broad overview of the South African table grape industry to illuminate its significance. The different financing models will be identified and an explanation on how each work. During this chapter the need for SCF that is developed during table grape exports is described in detail.

A concept model is developed during Chapter 4 from the Supply Chain Council's SCOR[®] framework and M4SC[™] framework combined with two financial models to improve cash flow. The M4SC[™] framework is adapted to place the focus on SCF as a supply chain process to overcome financial underperformance. The concept model enables the organisation to analyse the business strategy, measure the performance of the supply chain to identify the gaps, identify and implement a solution for the gap, and identify changes in resources required to implement the solution.

Chapter 5 contains the case study that is developed on Denau Farming's operations and financial flow. The whole supply chain of Denau Farming will be investigated in detail with the focus on the financial flow and the timeliness of payment received from customers. The concept model is incorporated into the case study.

During Chapter 6 the efficiency of Denau Farming will be measured using SCOR[®] cash-to-cash cycle time as a performance metric. The current cash-to-cash cycle time will be compared to the expected cash-to-cash cycle time of the two SCF models. The two SCF models will also be compared with each other to determine the better possible solution. The impact on Denau Farming's EVA[®] model will also be analysed. Chapter 7 includes a discussion on the case study of Denau Farming, identifying and highlighting the most important discoveries made from the case study.

Chapter 8 consist of recommendations for improving the observed supply chain. This chapter will also serve as a foundation that can be used by farmers, banks, financial service providers, and logistics service providers as a guideline to help improve their processes and operations in terms of freeing up tied up capital that is tied up in supply chains. The conclusion will summarise the complete study with recommendations on implementation of best practices. The final part of the

research includes areas for additional research and future research. Figure 1.2 is a graphical illustration of the structure of the thesis emphasising the flow and structure of the research.

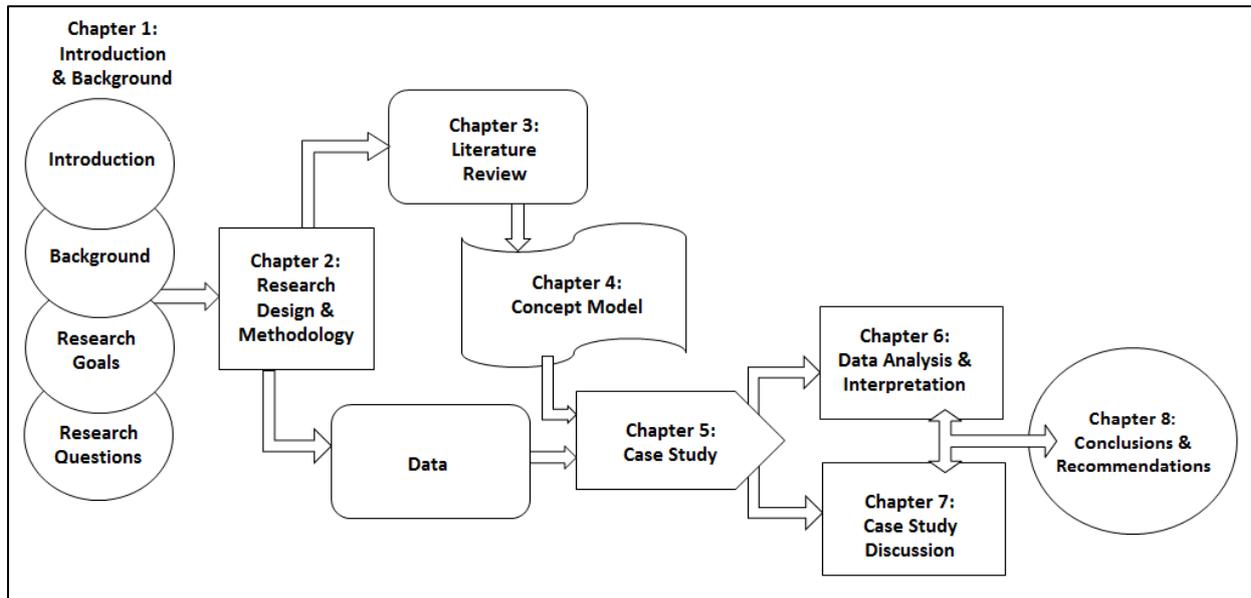


Figure 1.2: Flow and Structure of the Research

Chapter 2: Research Design and Methodology

2.1 Introduction

In this chapter the flow and structure of information, methods, and techniques used during the research is given. As can be seen in figure 2.1 the research consists of three corresponding phases which includes: Research Design, Research Methodology and Research Techniques. The overall research design is exploratory in nature since it seeks to investigate particular situations that have not been researched previously. Exploratory case studies are developed to provide insight into a given situation and investigate phenomena characterised by a lack of detailed preliminary research. The existing literature is then used to explore table grape specific correspondence. The research is unique in the sense that no similar research that is based on the South African table grape export supply chain has been done before.

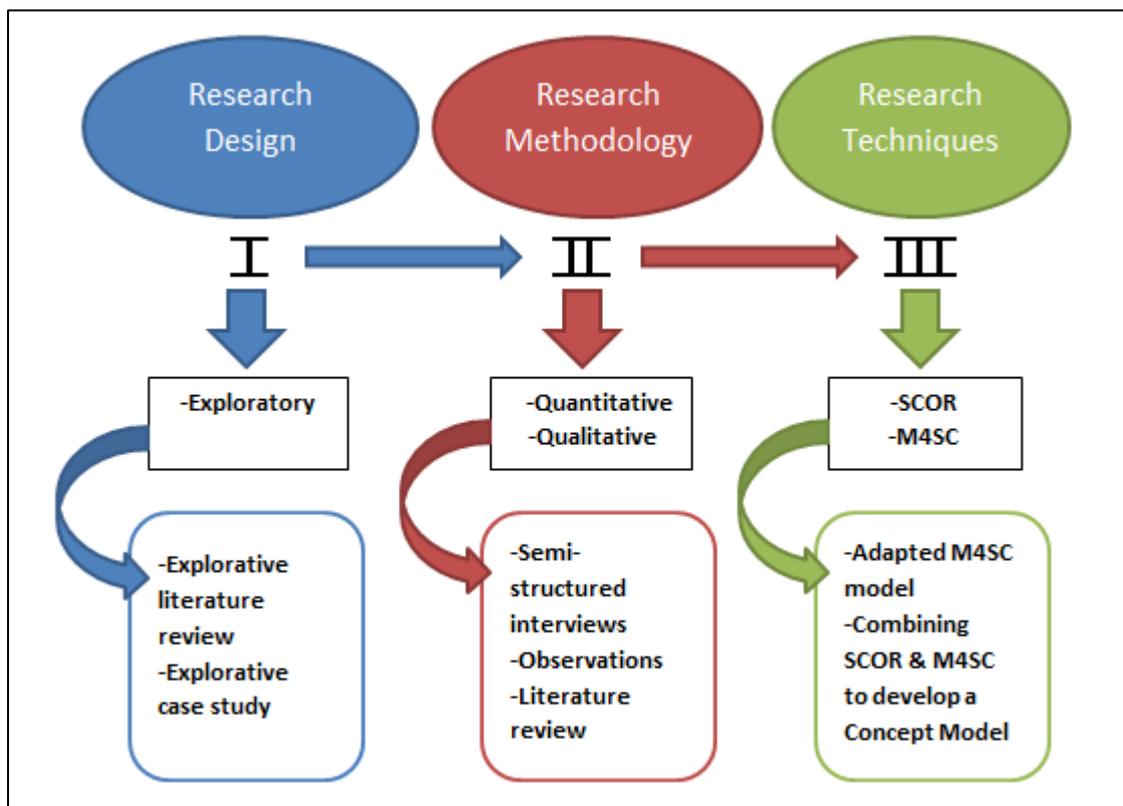


Figure 2.1: Research Flow.

The research methodology followed during the research includes the gathering and use of both quantitative and qualitative data. Data consist of primary research that was gathered directly from

stakeholders. Secondary data is also used in the form of existing literature. The methods used to collect data were by means of semi-structured interviews, observations, and existing literature.

Research techniques are the logical approach to obtain information and the way in which it is presented. Two techniques (models) are used during the research: the Supply Chain Operations Reference Model (SCOR®) and the Management for Supply Chains (M4SC™) framework. Only the important parts that are relevant to the research were extracted and adapted from these models. These models can be seen as the building blocks of the research. A concept model is created by combining the SCOR® Model and the adapted M4SC™ framework.

Triangulation is a method used to obtain data and information from multiple sources and methods to support propositions and findings (Rule *et al.*, 2011). The process of triangulation has been suggested by researchers doing qualitative research and case studies as a vehicle for achieving high quality, rigorous and respectable research (Rule *et al.*, 2011). During the research the same questions are asked to various stakeholders and the questions lead to conversations to obtain information. The goal is to acquire the perspectives of different stakeholders and to find a connection between their different views.

Experiential learning is a technique used during the research to demonstrate the influence of action research. Action research is done in the form of simulating the SCF models in Denau Farming's business model and to identify the expected results. Dale's Cone of experience (figure 2.2) indicates that experiential practice results in the highest level of retention.

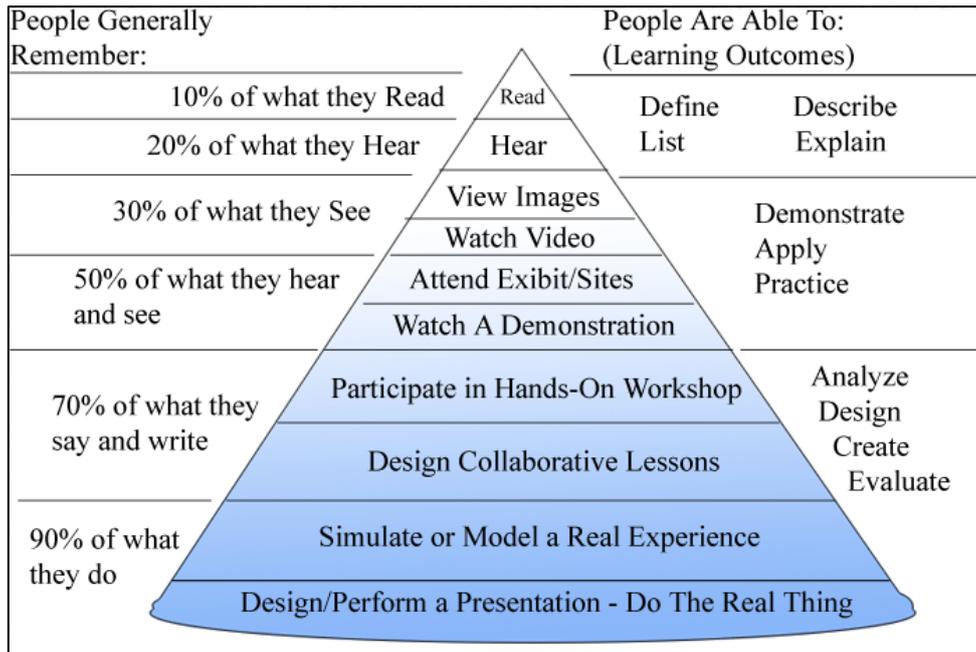


Figure 2.2: Dale's Cone of Experience
 Source: Pastore, 2003.

Figure 2.2 demonstrates what the author is able to do at each level of the cone relative to the type of activity he is performing. The author is able to remember best what he has done by simulating a hands-on experience in a real life context. This can lead to conveying the importance and significance of the research to the stakeholders.

2.2 Literature Review

Firstly a thorough literature review is done to broaden the knowledge of the researcher regarding SCF and the gap in the existing body of knowledge. This includes previous studies that have been done on SCF to get the perspective from different authors. The different sources of information that were considered include the internet, books and journal articles, and through word of mouth by industry experts. Several goals were met by completing the literature review. It is important to understand the definition of the term SCF and to know why, according to existing theory it is beneficial to implement it in your supply chain as well as the limitations it withholds before the practical part of the research is done. Theory on how the need for SCF is developed forms a critical part of the research. The idea is to develop an idea of how to measure the performance of the table grape supply chains in a global perspective. Literature on the physical flow of the table grape supply chain forms part of the research. This was essential in understanding the physical flow of goods as well as the interrelated financial flow of the fruit.

2.3 Selection of Participants

There are about 631 table grape producers in South Africa spread over five major production regions (SATI, 2012). The scope of the thesis consist of Denau Farming, a table grape farm located in the Hexriver Valley, which is the biggest producer of table grapes in South Africa. The reason for choosing only one table grape farm is to be able to do an in depth analysis.

Table grape export supply chains are very complex in nature, that is a result of more than 85% of the production capacities in South Africa are exported which leads to a large variety of organisations and processes to form part of the supply chains (SATI, 2012). This means that to be able to understand the complexities of the supply chain all the stakeholders must be consulted to gain their perspectives and expertise.

Information will be gathered from:

- Export organisations/agents,
- Table grape producers,
- Accountants,
- Forwarders, and
- Banks/financial service providers.

2.4 Semi-Structured Interviews

Semi-structured interviews were held with all participating organisations and parties to gain an in-depth understanding of how each supply chain works and who is responsible for the financing of the different supply chain processes. The semi-structured interviews helped the researcher to gain an understanding of the current financing problems.

Interviews with export organisations and banks/financial service providers were held to gain an understanding of the current financing problems during the as-is operations of the farmer and other supply chain processes to get the products from point of origin to point of consumption. Interviews were scheduled and held with FreshVest, ABSA AgriBusiness, Fanie Naudé (Denau Farming), Erasmus Van Zyl (Vallei Sekretariële Dienste & Geoktrooierde Rekenmeesters). A second set of semi-structured interviews was scheduled with Hoekstra Fruit Exporters, Fanie Naudé and Aztec Money to find solutions to implement into Denau Farming's supply chain to improve cash flow.

2.5 Observations

Observations were primarily made to understand exactly how the supply chain operates. The first goal is to understand the physical flow of the fruit and then understand the interrelated financial flow. Denau Farming's supply chain was observed by following the goods from the vine to the port, up until the goods are loaded onto the ship. This technique is known as, 'Stapling yourself to an order', and often helps to clear any uncertainties that are observed in existing literature. The reason for doing this is to get a detailed understanding of how each process works from harvest to shipment. The observations also helped the researcher to understand the time the downstream physical flow of goods take and the corresponding time it takes for upstream financial flow back to the farmer.

2.5.1 Farm Visits

After the interviews with various organisations the current problems of Denau Farming's supply chain and all its processes was observed to investigate the reasons these problems occur and if the problems are a result of financial constraints. The goal was to observe exactly how the table grape supply chains work in practice and connecting the information obtained through interviews with practical application. Observation of the supply chain served as a catalyst for achieving another research goal i.e. linking the physical flow of goods with the financial flow of goods. This enabled the researcher to map the supply chains in detail from production to consumption. Farm visits took place during the harvest season of table grapes to investigate the export supply chain.

Farm visits includes the observation of the pack houses and cold stores, as these facilities forms important nodes in their respective supply chains. Farm visits gave the researcher an idea of the incurred costs and the extent of capital requirements of equipment and facilities needed for production and harvesting. Interviews and conversations were conducted with various employees during these visits such as farmers, managers, accountants, farm workers etc.

2.5.2 Port Visits

Port visits formed the final part of the observations of the supply chains. The researcher visited the container terminal of the Port of Cape Town to observe the port operations and processes of the respective supply chains. The containers were followed from the farms through the port gates up until the containers were loaded onto the vessel. The port visits were essential towards understanding exactly how the port operations work in order to connect the financial aspect of port operations.

Upon the completion of the observations the researcher acquired an in-depth understanding of the physical flow from production to consumption and a logistical flow map was made. Photographs are used to illustrate these maps more effectively. The aim of creating the supply chain maps was to improve the visualisation of the supply chains in terms of physical and financial flow and to give the reader a better understanding of the time element during exports. The time of each major process is also identified to investigate the correlation between the financial and physical supply chain.

2.6 Case Study

Case study research was chosen as a research approach to generate an understanding of and insight into a particular instance. A case study makes it possible to explore a general problem or issue within a limited and focused setting (Rule *et al.*, 2011). SCF continues to receive a lot of attention and during this research the problem could be focussed on the table grape supply chains. The case study enables the researcher to test existing literature and theory with reference to the particular case (Rule *et al.*, 2011).

A case study is developed on Denau Farming's table grape export supply chain. The background of the farm is given to plot the environment in which the case is developed and the supply chain as it is operating currently is described. The goal is to give the reader an understanding of the financial flow of the supply chain. The concept model forms part of the case study and helps to formulate the case.

The main goal of the case study is to explore how to improve cash flow by implementing SCF, thus optimising the cash-to-cash cycle time. This will make it possible to make conclusions about the relationship between certain financing methods and the cash-to-cash cycle time.

An explorative case study was created of Denau Farming's table grape export supply chain. An exploratory case often examines a phenomenon that has not been investigated before and can lay the basis for further research (Rule *et al.*, 2011). A thorough description of the case was provided and was related to the broader context and existing literature.

In order to develop the case study the necessary data was extracted and converted into information. The data was extracted by means of semi-structured interviews and conversations with the stakeholders involved as mentioned earlier in Section 2.3.

2.7 Concept Model and Comparing

The SCOR[®] framework was used to measure the efficiency of Denau Farming's table grape supply chain making use of the SCOR[®] performance attributes. The SCOR[®] framework has been developed by the Supply Chain Council to describe the business activities associated with all the phases of satisfying the customers demand (Supply Chain Council, 2014). The five SCOR[®] performance attributes are reliability, responsiveness, agility, cost, and asset management. Only the asset management performance attribute was used to measure efficiency. The cash-to-cash cycle time is a metric used to measure the efficiency of the supply chains (Supply Chain Council, 2014). The SCOR[®] Model has three levels of strategic metrics to measure performance, but emphasis will be placed only on level-1 and level-2 metrics.

The Supply Chain Council has developed another tool for managing supply chains more efficiently and effectively (Supply Chain Council, 2014). This framework is called M4SC[™] and is the acronym for Management for Supply Chains. M4SC[™] was developed to overcome the complexities of the SCOR[®] Model and is used in conjunction with the SCOR[®] model not as a stand-alone framework (Supply Chain Council, 2014). Since financial supply chain management does not form part of the scope of M4SC[™] the framework is adapted to be more financially orientated. The adapted M4SC[™] model exists of four layers that include: Align Strategy, Align Network, Align Processes, and Align Resources.

The SCOR[®] Model and the adapted M4SC[™] framework are used to create a concept model. This concept model has four primary objectives. The first is to do a strategy analysis to determine the strategic goals of the farm and identifying the vision, mission, and growth plans. The next objective is to describe the as-is supply chain and identifying the gap in the supply chain. Next, the solution to the supply chain gap is defined, in this case a SCF model. The final objective is to define the to-be supply chain after the SCF model is implemented and the change in resource requirements.

After the case study were developed using the concept model the expected effect the two SCF models has on EVA[®] is identified. The effect that the cash-to-cash cycle time has on EVA[®] is based on research by Bolek *et al.* (2012) into the correlation between cash-to-cash cycle time and EVA[®].

The concept model forms part of the case study in Chapter 5 that is based on information and data of Denau Farming. The concept model proposes two SCF models that can possibly improve Denau Farming's cash-to-cash cycle time. The models that were chosen are based on the demand of Denau Farming to generate cash flow late during the transaction lifecycle.

The goal of using SCOR[®] and M4SC[™] is to help top management to manage supply chains more efficiently by using metrics that measure cash flow and to implement a solution to improve cash

flow. In Chapter 4 the SCOR® framework and the adapted M4SC™ framework is described in detail to develop the concept model.

2.8 Feedback

The final part in completing the research is to analyse the case study and disseminating the results and recommendations to stakeholders. These results and recommendations includes the expected effect the two SCF models will have on cash-to-cash cycle time and EVA®. Any changes in the supply chain that is required after implementation of the two SCF models will be identified and the influence the models has on the supply chain partners will be explained. The results in this study will indicate whether SCF will make Denau Farming's table grape supply chain more efficient by generating timelier cash flow and optimising working capital. Recommendations are given to Denau Farming whether they should implement one of the identified SCF models to improve their cash-to-cash cycle time.

2.9 Types of data used

Qualitative data will consist of interviews and focus group discussions to get first-hand information from table grape producers, banks/financial service providers and export organisations.

The cash-to-cash cycle time of Denau Farming forms part of quantitative data used in the thesis. This type of data consists of the different components to calculate the cash-to-cash cycle time. The cost of goods sold is a catalyst to make it possible to calculate the cash-to-cash cycle time. Quantitative data was collected from the table grape producers directly. Interviews with some of the accountants on the farms were initiated to retrieve some of this data and related information. All the quantitative data is retrieved from financial statements and includes: direct material costs, direct labour costs, indirect costs related to making product, inventory days' of supply, days' sales outstanding, and days' payables outstanding. The data is then transformed into information to make sense of it.

Primary data will be gathered by means of structured interviews, focus group discussions and questionnaires. Structured interviews with individual table grape producers and financial service providers are constructed to get an in-depth understanding of how they conduct business and how each forms part of the table grape supply chains. Producer-focus groups will give a good perspective of what their different opinions are on each of the SCF models.

Secondary data will mainly consist of articles and other academic journals of research that was done by other researchers. This type of data will mainly be used in the literature study to broaden

knowledge about SCF and the current financing problems that farmers are facing. The aim of the study will be to create an advantage throughout the whole supply chain and not just for an individual player in the chain.

2.10 Reliability and Consistency of Data

Reliability is the quality of the method used to obtain the same data by repetition of an observation of a phenomenon (Babbie, 2010). Without the use of structured questionnaires during interviews can lead to comparing unreliable and inconsistent data. Reliability also refers to a given study's sustainability, predictability, dependability, stability, and accuracy as well as the likelihood that the same measurements will be made by using the same or similar instruments when the study is repeated.

Making use of non-standardised research methods can improve the reliability of the research in terms of qualitative data that are obtained. The exact research techniques that was used during this research should not be copied in future research since it reflects the as-is situation when the research were done. The value that non-standardised research methods add is that it is flexible and enables that the complexity of the subject can be researched in depth.

The validity of the data is the accurate reflection of the concepts and the data that is measured during the research. Saunders *et al.* (2007) states that validity is the extent in which the researcher gained knowledge and experience that makes it possible to communicate the same meaning in context. The relevance and transferability of the research are both important components of validity. It measures how the results will be relevant for other organisations that do not form part of the scope of the research. Transferability becomes a problem when the scope of the research is too small to develop theory on the whole population. This problem can be overlooked when the focus is on specific research environments and that the results and conclusions are not generalised in this study to all export table grape farms in South Africa. Recommendations can however be made if similar research environments exist.

Chapter 3: Literature Review

3.1 Introduction

The majority of research done on SCF is based on organisations that process products from raw materials to finished goods, while agricultural organisations that produce un-processed consumer goods have not received the same amount of attention. Wang *et al.*, (2013) did research on agricultural SCF and concluded that farmers have strong funding needs but have difficulty obtaining finance through the traditional channels.

Gomm (2010) researched the correlation between supply chain management and finance to develop a definition for SCF. He proposed a SCF framework that provides the basis for analysing and communicating the financial issues and linking logistics and supply chain management to corporate goals. During this chapter previous research in terms of the definition of SCF is adapted and the most appropriate definition is developed. Gomm (2010) also recommended that further research should be done on the case studies provided in his research by developing case studies in more detail in order to further validate his work. Randall (2009) concluded that supply chain managers should include cash-to-cash and other SCF metrics to generate a competitive advantage for all co-operating supply chain partners.

Presutti & Mawhinney, (2007) explored the critical link between supply chain performance and business performance by demonstrating how supply chain metrics can be coordinated and linked to corporate financial metrics. Some of the supply chain metrics that Presutti *et al.*, (2007) used are based on the Supply Chain Operations Reference (SCOR®) framework. The approach Presutti *et al.*, (2007) followed is adjusted during the study and the metrics used are explained later in research.

More & Basu, (2013) researched the different challenges that confront SCF and came to the conclusion that the lack of common vision among supply chain partners is the most critical challenge confronting SCF. This chapter will include a section on the advantages and limitations of SCF.

3.2 SCF Defined

If an organisation needed to support their operations in the past they would obtain liquidity and working capital independently of their trading partners. Organisations would seek financing based on their own terms and financing needs (Dyckman, 2011). More often organisations are looking for collaborative ways to optimise cash flow and working capital.

The term SCF brings to mind the provision of financing to the supplier to be able to get products when needed. When the term SCF is used the first thing that comes to a financing professional's mind is the suppliers' finance structure by which a large credit worthy buyer, seeking a working capital enhancement via the extension of payment terms, agrees to approve invoices on behalf of its suppliers, through banks or financial service providers, and offers an early payment discount that reduces the supplier's carrying cost over the life of the invoice (Dyckman, 2011).

The buying habits of organisations have changed as time has gone by and they are seeking less expensive sourcing opportunities while at the same time not compromising product quality. During financial crunch times there are an increased need for liquidity through more straightforward receivables sales structures. As these variables changed over time SCF has been developed to adapt the to change.

SCF can be defined as financial arrangements in the form of debt, equity or financial contracts used in collaboration of at least two supply chain partners (buyer or seller-led solutions) and facilitated by the focal company with the aim to improve the overall financial performance and mitigate the overall risks of the supply chain (Cool Connection, 2013).

SCF was initially a marketing umbrella to repackage traditional products as trade, insurance, payments and cash management (Popa, 2013). In recent times banks have identified those elements that are of value to their customers that could be developed to better serve their customers' physical and financial supply chain.

SCF has come a long way since its first implementation and the evolution of SCF can be divided into three "phases". The first SCF model was introduced in the 1990s which combined domestic trade finance with supply chain management through an innovative invoice financing arrangement known as reverse factoring (Popa, 2013). This is a three way arrangement where the receivables of the supplier are purchased by the bank with legal recourse to the buyer. At this time the model was only used in selected domestic industries.

The second model of SCF developed as many large companies started to source their raw materials from SME's around the world and the key catalyst being technology platforms (Popa, 2013). These platforms connected all counterparties around the world and it made it possible for multiple credit providers to compete on financing, expecting the attraction of more suppliers by the lower cost of receivables financing.

The third model enables all the pieces of the financial supply chain to be integrated from end to end (Popa, 2013). The outcome is fully automating the buyers' procure-to-pay and suppliers' order-to-

cash cycles. This model also support event-triggered financial services along the physical supply chain and ensures full transparency of each transaction.

During SCF, financial arbitrage between large corporate companies and their buyers and suppliers are leveraged (Dyckman, 2011). To put it into perspective the buyers are able to enhance working capital or reduce the cost of goods sold, and suppliers are able to access capital at reduced rates. Dyckman (2011) explains SCF as the situation where a large, creditworthy buyer that seeks a working capital enhancement via payment terms enhancement, agrees to approve invoices on behalf of its suppliers and offers an early payment discount (through a third party) that reduces the supplier's carrying cost over the life of the invoice.

In supply chains where buyers are heavily reliant on key suppliers, like the majority of export table grape supply chains, SCF is an attractive financial tool to create an incentive for partnership (ING Group, 2008c).

Letters of credit is a tool that is often used to compliment SCF programs. Letters of credit serves as a guarantee for payment by the importer. Letters of credit are used when the exporter does not want to take the risk of shipping goods and not receiving payment from the importer. The exporter can ask for the importer for a guarantee of payment, via the bank, and issue a letter of credit to the exporter. Thus if the importer has inadequate funds to pay the exporter the bank steps in and pays the exporter on behalf of the importer. The bank then has to reclaim the money from the importer (International Chamber of Commerce, 2013).

The role of SCF is to optimise the availability and cost of capital within a given buyer-supplier supply chain (Global Business Intelligence, 2012). Improving the financial efficiency of the whole supply chain and reducing the working capital of buyers and suppliers is the focal point of SCF. The importance of efficient SCF are reflected through sufficient levels of working capital being available. Working capital is simply the amount of cash which a company requires to fund the difference between payment and collection (ING Group, 2008c).

It is important that effective buyer-supplier collaboration takes place by letting interested parties gain visibility and to be able to track the flow of goods and financial flows of the supply chain (Betts, 2013). The use of the correct technology platform by all relevant parties eases the implementation of certain SCF programs (Citibank, 2012).

The importance of SCF is growing at an increasing rate to improve today's global and domestic trade. The main goal of SCF is to optimise working capital and release cash throughout the whole supply chain, -buyers, sellers and the bank/financial service providers (CGI Group, 2007). It is however

important to emphasise that not only one stakeholder of SCF enjoys the benefit of more working capital availability but rather to create a win-win-win situation.

SCF is applicable to small and large, global and domestic companies. Currently small companies can face lags of up to 180 days between receiving payment after the goods has been shipped (Citibank, 2012). These lags in receiving payment depress cash flow and can force a delay in production processes. Many suppliers have the problem of late payments that stops or slow-down the product flow to buyers (Tavan, 2012).

There is always a cost involved in setting up SCF and these costs are usually paid by the suppliers rather than the buyers. Improved financing terms generally offset the costs which makes SCF very beneficial for suppliers.

Trade credit is an early form of SCF over time. Trade credit is a short term business loan when a buyer purchases goods from the seller. When the seller allows for delayed payment it is seen as finance provided by the seller to the buyer (Lee *et al.*, 2011). Trade credit has been the main source of working capital to a majority of organisations, especially for organisations in the start-up and development phase. By delaying payments the buyer has the ability to increase the order size due to the time value of money (Lee *et al.*, 2011).

SCF is still in its developing phase and has a lot of potential left to unlock. There are currently no standards in terms of the terminology used and what each financing model has to offer. Depending on the industry in which SCF is implemented the terminology can differentiate to a large extent, while it is exactly the same financing model in principle.

For the purpose of this research the definition of SCF by Bryant *et al.* (2013) is used as follows: “The use of financial instruments, practices and technologies to optimise the management of the working capital and liquidity tied up in supply chain processes for collaborating business partners. SCF is largely event-driven. Each intervention (finance, risk mitigation or payment) in the financial supply chain is driven by an event in the physical supply chain. The development of advanced technologies to track and control events in the physical supply chain creates opportunities to automate the initiation of SCF interventions.”

3.3 Advantages and Limitations of SCF

The key towards implementing SCF is that benefits must be reflected onto all parties involved in the program as well as making the whole supply chain more efficient. The buyers, suppliers and banks

must recognise the potential new opportunities and benefits their business can create from the program otherwise they will have no incentive to take part in it.

3.3.1 Advantages of SCF

One of the main benefits of SCF is hard to quantify-, namely creating a solid relationship between the buyer and the supplier. When deciding to implement a SCF program it is important recognising that an increase in days' payable outstanding has a negative effect on the days' sales outstanding of the suppliers. It is however important that the buyer understands this can weaken the stability of the supply chain. Implementing SCF can mitigate the risk of this happening although the buyer can extend its payment terms while the supplier's days sales outstanding is not influenced negatively.

Buyers that are involved in SCF primarily enjoy longer payment periods that will increase their working capital. This means that the buyers will be able to reduce their accounts receivables and inventory, while delaying accounts payables (Tavan, 2012). The buyers will be able to negotiate higher discounts from their suppliers which will reduce the cost of goods. SCF makes it possible for the buyer to have better control over the cost of the financial input that has gone into the supply chain.

Supply chain stability is created by developing partnerships with suppliers and is one of the advantages that buyers engaging in a SCF program experience (ING Group, 2013d). The buyers and suppliers will both know what they want to achieve and the role they have to play make it possible by implementing harmonised business processes.

The cost and the total number of payments that the buyers have to make as well as the cost of invoice settlement by the buyer are reduced. The buyers will also be able to focus on their core business processes when a financial provider is involved in the program (ING Group, 2013a).

Suppliers' benefits implementing a SCF program are mainly generating capital and creating a more reliable cash flow (ING Group, 2013b). Funding is scarce and the costs related to funding can be very high, though SCF sources of funding can be diversified. SCF rates are more favourable to suppliers than using alternative financing options like traditional bank loans.

One of the primary benefits of implementing a SCF program is improved forecasting of cash flow and balance sheet management (CGI Group, 2013). The benefits will reflect off balance-sheet as well as generate cash by selling receivables and thus improving the organisations credit standing.

The Deutsche Bank did a study on SCF in the automotive industry and found that companies with SCF programs have a 12 day advantage in DPO compared to peers, are 6.5 times more likely to have

decreased end-to-end financing costs built into the supply chain and can achieve a negative cash conversion cycle (Anon., 2009).

There are a lot of additional cost-saving opportunities that can be achieved by automated payment processes in a SCF program. No commitment fees have to be paid and on-demand financing to the precise amount needed is provided with minimum commitment (ING Group, 2013).

SCF makes it possible for organisations to focus on core skills. Organisations are able to focus on their core business processes and plan their strategy with more confidence because of the cash flow certainty and increased transparency in the supply chain. Table 3.1 shows the main advantages of implementing SCF to generate cash flow and optimising working capital for the buyer, supplier and the financial institution.

Table 3.1: Benefits of SCF across the Supply Chain

BUYER	SELLER	BANK
<ul style="list-style-type: none"> • Reduce the cost of goods purchased 	<ul style="list-style-type: none"> • Reduce the cost of capital through improved Days Sales Outstanding (DSO) and lower finance costs 	<ul style="list-style-type: none"> • Build stronger, collaborative relationships with customers
<ul style="list-style-type: none"> • Reduce working capital requirements through improved Days Payable Outstanding (DPO) 	<ul style="list-style-type: none"> • Generate flexible, predictable cash flow 	<ul style="list-style-type: none"> • Enhance customer retention
<ul style="list-style-type: none"> • Enjoy a more stable supply base 	<ul style="list-style-type: none"> • Gain access to low-cost finance rates 	<ul style="list-style-type: none"> • Increase bottom line by supporting customers' entire supply chain from end-to-end
<ul style="list-style-type: none"> • Improve relationships with sellers 	<ul style="list-style-type: none"> • Acquire more secure source of Working Capital 	<ul style="list-style-type: none"> • Increase reach of Trade Finance organization
<ul style="list-style-type: none"> • Improve visibility across the financial supply chain 	<ul style="list-style-type: none"> • Gain visibility into the payment process 	<ul style="list-style-type: none"> • Expand profile of Trade Finance organization

Source: ING Group, 2013c.

3.3.2 Limitations of SCF

More & Basu, (2013) studied the challenges of SCF in the context of Indian industry and identified that there are internal and external SCF challenges. They classified these internal and external factors into six categories based on organisational focus areas:

- Human resource
- Information technology and technology
- Finance
- Inter as well as intra-firm coordination, collaboration and alliance
- Organisational policy, strategy and practices
- Macro-institutional

One of the main human resource related challenges is the lack of knowledge among supply chain partners of the SCF initiatives that are available (More & Basu, 2013). Due to the lack of knowledge by corporate professionals the true value of optimal working capital cannot be realised.

The SCF challenge that is being experienced in terms of information technology and technology is the inefficient processing of financial transactions along the supply chains (More & Basu, 2013). This problem is magnified by some organisations that still use paper-based manual processes. These paper-based manual processes add delays in the receipt of payment and increases the working capital required.

There is a variety of different financial challenges that influence the implementation of SCF (More *et al.*, 2013). Lack of automation in the payment processes along with poor visibility is the result of poor cash flows through the supply chain.

Without the coordination and collaboration between the supply chain partners and within the organisations own departments SCF will face difficulty to be implemented. There is generally a lack of a common vision between supply chain partners that results in suboptimal cash flows across the supply chain (More & Basu, 2013).

The policies and strategies chosen and the practices that are implemented in the organisation has the potential to hinder SCF programs. The process of selecting a supplier has moved from an operational to a strategic decision. The internal processes of a supplier has increased in importance since they share business risk with other supply chain partners and the decision they make has an impact on the whole supply chain (More & Basu, 2013).

There are various macro-institutional challenges facing SCF implementation. During international trade there are challenges such as multiple currencies, different languages, different terminology and multiple legal jurisdictions (More & Basu, 2013).

A problem with SCF is that it has been developed independently and no common foundations or standards exist (Casterman, 2013). It makes it difficult for clients to compare the different SCF

services that are being provided. The problem becomes even more prominent when a client decides to switch to another provider. The BAFT-IFSA organisation is currently working on a research project defining the SCF models to develop global unity (BAFT-IFSA, 2010).

There is an existing problem of a late start for providing SCF services. Usually the financing is provided when the invoices are approved while the organisations' actual financing needs and the need for risk mitigation start at a much earlier stage (Casterman, 2013).

The majority of SCF programmes are buyer-centric and address the needs of large buyers while there is also an opportunity to serve large sellers too, i.e. seller-centric, mainly addressing payment assurance (Casterman, 2013).

While most SCF programmes are buyer-centric it is required that the suppliers are enlisted on the buyer's bank portal. Suppliers that want to benefit from the SCF program using their buyers' banks are facing operational issues that are caused by the existence of a multitude of SCF platforms.

There are costs and operational risk involved in gaining new customers for banks. These costs are known as the know-your-customer (KYC) costs and require checks to be performed which in turn increase the total processing cost. The cost to set up SCF is usually carried by the supplier and no cost is paid by the buyer as long as the volumes are sufficient (ING Group, 2008d). These costs include:

- Set up and structuring costs
- Regulatory costs
- Risk premium for credit risk
- Operational fees (potential discount offered to buyer)
- Management time

There are some legal and accounting issues that should be considered when setting up a SCF program. The solution that has been selected, whether it has been operational for some time or a new solution, should be reviewed in line with IFRS and GAAP to avoid any regulatory and accounting issues.

During an interview with Herman Louw, CEO of Hoekstra Fruit Exporters, he stated that there are industry specific limitations in terms of SCF for the table grape industry. The problem is that there is a time constraint for factoring an invoice for table grape exports. The importer must firstly determine the quality of the table grapes on arrival to be able to give a value of the invoice to be factored. This leaves you with a huge gap for the first three to six weeks in terms of cash flow.

3.4 Different Types of SCF Models

Before the different SCF solutions are discussed it is important to understand the different stages of a transaction during which SCF can take place. There are various events or triggers that can release cash and reduce the cost of financing in the supply chain (Global Business Intelligence, 2012). These events or triggers are typically pre-shipment finance, shipment or in transit finance and post-shipment finance (ING Group, 2008a).

Pre-shipment finance is made available to a seller based on a purchase order received from a buyer and targets the early stages of the supply chain before the invoice is provided to the buyer (Global Business Intelligence, 2012). In other words the bank or financial service provider finances the production or purchase of goods to be shipped. Raw materials, wages, packing costs and other pre-shipment expenses are some of the items that need to be financed to cover all the related working capital needs of the seller. Pre-shipment finance requires the bank or financial service provider to understand their customers' supply chains and buyer-supplier relationship in depth (Global Business Intelligence, 2012). Usually pre-shipment insurance is required to cover the risk of bankruptcy.

During shipment or in-transit finance the bank or financial institution provides financing from the moment the letter of credit is presented until the payment is received. At times the letter of credit has time constraints on payment, the bank can provide financing until the maturity date is reached (CGI Group, 2008b). Vendor-managed inventory financing is an example of shipment or in-transit financing.

Post-shipment finance is provided to a seller using the receivables as collateral. The seller provides shipping documents as evidence of a receivable while the bank may also require to a bill drawn on the buyer for the goods exported. Usually two events can occur. The one is where the invoice is not approved by the buyer (pre-acceptance) and the other where the invoice is approved by the buyer. The first event mentioned it involves limited purchase of trade receivables from the seller (Global Business Intelligence, 2012). The latter event is more often known as payables finance, reverse factoring, confirming, and approved payables finance.

These triggers are seen as different points in which financing is made possible and is used to gain control over financial processes and serve as more options to use cash and credit optimally (More & Basu, 2013). Figure 3.1 shows the different stages of Supply Chain Finance based on supply chain event triggers. These triggers include pre-shipment financing, in-transit financing, and post shipment financing.

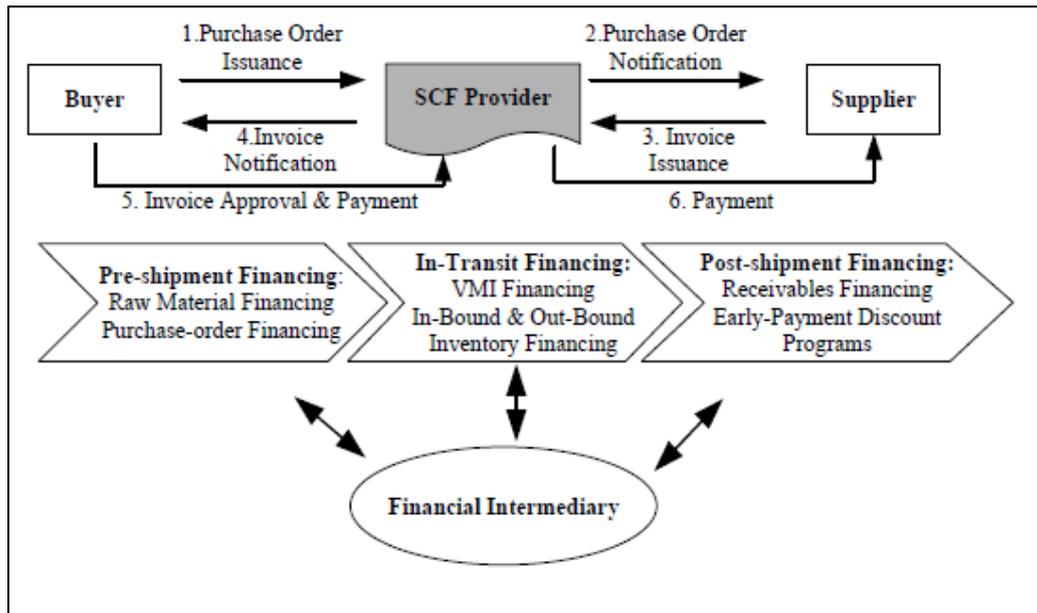


Figure 3.1: SCF Based on Supply Chain Event Triggers

Source: More & Basu, 2013.

There are the three different types of SCF that can be used depending on the organisation strengths. These three types of SCF are asset-based financing, buyer-led financing and supplier-led financing respectively and are based on the ING Guide to Financial Supply Chain Optimisation. In the next section the three types of SCF and each of their methods are discussed.

3.4.1 Asset-based financing

Asset-based financing is a process that releases working capital through the assets that were created in the supply chain. Selling receivables at a discounted rate to financial institutions are an example of this type of financing. Using asset-based financing you can use different assets like purchase orders, receivables or inventory for loan collateral. Factoring is another asset-based method that will be discussed later.

Accounts receivable financing

This is a method is often used by companies with a low credit rating and has proved to be a useful financing tool. Over time more companies with good credit ratings are implementing this factoring as a financial tool to maintain working capital.

There are two types of Accounts receivable financing: pledge the account receivables and factoring (Popa, 2013). To pledge the account receivables occurs when the borrower pledges the company's account receivables to the bank to get finance in advance, and repays the bank/ financial institution once it receives the payment. The main outcome of factoring is to receive payment earlier to

generate a more predictable cash flow. The seller of goods will enter an arrangement with a financial institution to receive payment earlier rather than to wait for the buyer to complete the payment in the time agreed upon. The financial institution will purchase the firm's receivables at a discount. An acceptable factoring rate is between 70% and 90% of the value of the receivables.

The buyer of the goods can pay the financial institution directly or the payment are made as to the company as usual and then paid to the financial institution, depending on the agreement. It is important to note that the financial institution is taking all the risk.

Invoice discounting

Invoice discounting and factoring are very similar to each and the difference lies in the party carrying the risk. During factoring the buyer of the invoices carries the risk and during invoice discounting the supplier takes the risk. Credit insurance can reduce the risk of customers not paying the account receivables.

One of the most used discounting terms is the 2/10 Net 30 payment agreement. Here the buyer gets a 2% discount on the invoice if it is paid within 10 days instead of 30 days. The only problem with this type of discounting is that e-invoicing needs to be implemented, since it will almost be impossible to pay a supplier in 10 days if invoicing is paper based (Tavan, 2012). This prohibits it from being a viable finance option for most table grape producers because many farmers are still paper based. Figure 3.2 indicates how dynamic discounting works and is explained below through points one to six.

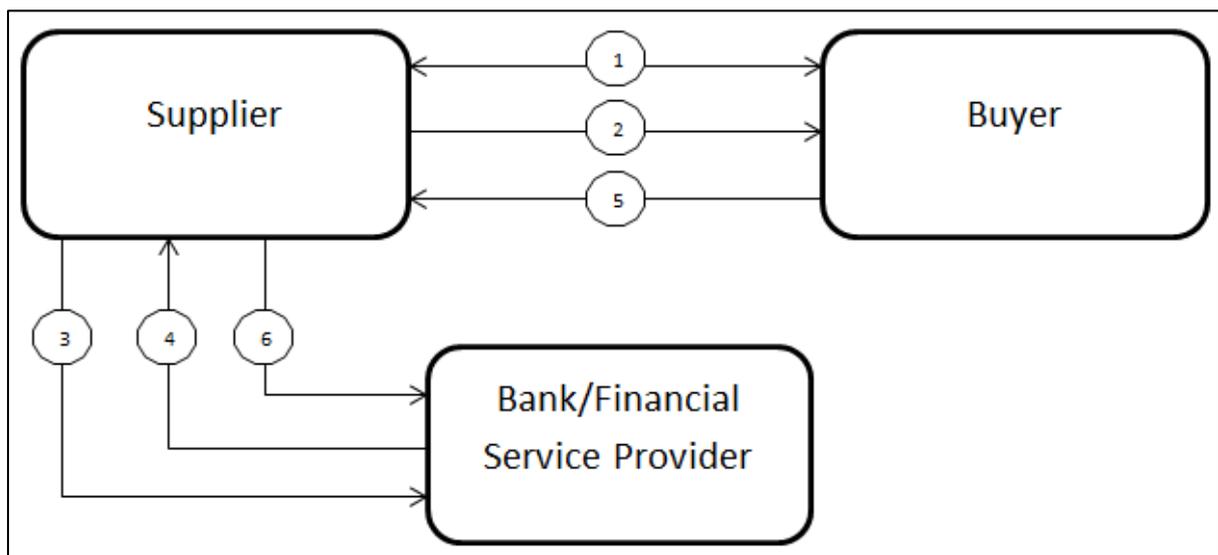


Figure 3.2: Invoice Discounting

Source: Adapted from ICC Banking Commission, 2013.

1. Both the supplier and the buyer agree on the sales contract.
2. The supplier provides the buyer with an invoice.
3. The supplier also gives a copy to the bank/financial service provider.
4. Invoice is approved by bank and cash is provided to the supplier at a discounted rate of the invoice.
5. Payment is collected by the supplier from the buyer.
6. Supplier repays the bank/financial service provider.

Inventory/Asset based financing

When using this financial tool the company can borrow money against assets to free up cash flow, and if the loan is not repaid the asset is repossessed. Typically these loans are tied to inventory and accounts receivables. This type of finance is more often obtained by manufacturing companies that carry large inventories.

Purchase Financing

Purchase financing is a good form of financing for companies that have fluctuations in business flow that correspond to seasonal changes. These seasonal peaks necessitate the payment of orders in advance. Purchase financing covers the period between procurement of inputs and sale of outputs. Companies that may have to pay for order in advance, purchase financing offers a form of bridging loan, covering the period between the procurement of inputs and sale of outputs.

3.4.2 Buyer-Led Financing

This type of SCF is provided by large buyers to their smaller suppliers. A financial institution is used to leverage the buyer's credit rating to enable early payment to the suppliers. This type of SCF stabilises the entire supply chain by providing continuous flow of goods from the supplier to the customer.

Reverse Factoring (Approved Payables Finance)

ING Group (2008c) believes that reverse factoring holds the most significant advantages of all the different types of financing tools. During reverse factoring buyers provide financial and information reconciliation to key suppliers based on approved invoices, hence buyer-led financing. A central technology platform is integrated into the buyer, seller and financial institution to facilitate invoice and credit note reconciliation, invoice trading and settlement between the parties.

Reverse factoring is a solution that aims to reduce the risk of disruption in the collaboration of information flows, physical flow of products, and financial flow (Popa, 2013). Reverse factoring is based on factoring where suppliers sell their receivables to factors for immediate cash. The

difference between traditional borrowing and factoring is that receivables are rather sold than pledged that results in no liabilities that are credited on the suppliers' balance sheet. Suppliers would typically sell receivables from more than one buyer, thus before factors enter an agreement they have to evaluate buyer portfolios (Seifert *et al.*, 2011).

Reverse factoring has three distinct characteristics from factoring. First, factors do not have to evaluate heterogeneous buyer portfolios, since it is buyer-led, and can charge lower fees. Second, since buyers are usually investment grade companies, factors carry lower risk and can charge lower interest rates. Third, as buyers participate in reverse factoring, factors obtain better information and can release funds earlier (Seifert *et al.*, 2011).

Figure 3.3 shows how the process of reverse factoring works. During reverse factoring the buyer issues a purchase order to the supplier and the bank and the supplier delivers the goods and presents the documents. The bank checks documents and notifies the buyer whether all is in order to proceed. The buyer accepts and the bank advises acceptance. The supplier requests to be paid early by the bank, while the buyer pays the bank back on the original due date.

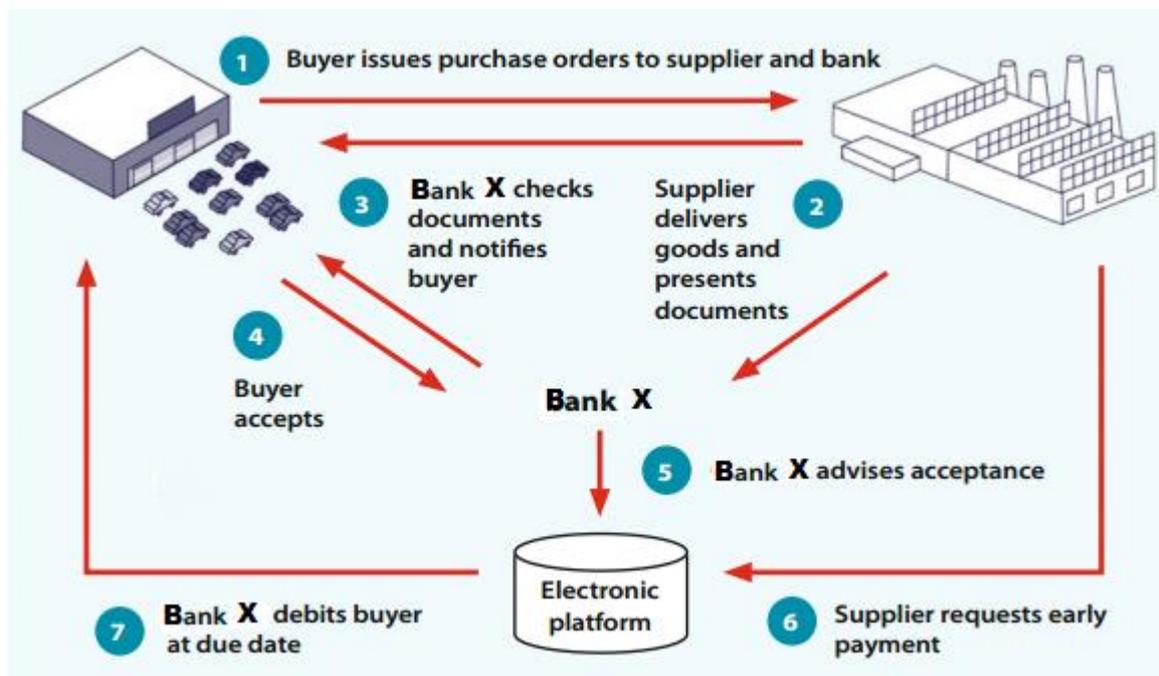


Figure 3.3: Graphical Illustration of Reverse Factoring

Source: Adapted from Citibank, 2013.

3.4.3 Supplier-Led Financing

This type of financing is the same as buyer-led financing only the financing is provided by large suppliers to smaller buyers, with a financial institution that leverages the suppliers' credit rating. This

gives the buyers payment options that suit them better without putting the suppliers' working capital at risk.

The key is to increase liquidity and relieve cash flow stress in the supply chain. This is achieved by a bank or financial service provider that offers early payment to the suppliers based on the approved payables of the buyer. Making use of a technology platform and the adequate infrastructure enhances communication between the parties. Firstly the buyer issues a purchase order and the supplier delivers the goods and invoices the buyer. The buyer then has to provide the invoices to the bank/financial service provider and should be approved for payment.

The financial service provider gives the suppliers the option of early payment, if the suppliers accept the early payment option the amount that is paid is less by a percentage of the total invoice value. The finance charges are based on the buyer's credit rating which means that the cost of finance is much lower for the suppliers. Smaller suppliers that are having difficulty accessing financing and finding the cost of financing a major problem has identified SCF as a viable solution.

There are a lot of new developments from this basic model that serve a much bigger supply base. Some of these developments include banks/financial service providers that provide financing on an even earlier trigger than the approved invoice. Another example is the provision of financing to sellers/suppliers securing against their receivables rather than the buyer's payables.

Bank Payment Obligation

Bank payment obligation is defined as: An unchangeable and independent undertaking of an obligor bank to pay or incur a deferred payment obligation and pay a recipient bank a specified amount at maturity following submission of all data sets required by an established baseline (Transaction Matching Application established between banks) resulting in a data match or an acceptance of a data mismatch (International Chamber of Commerce, 2013). The bank payment obligation is a technology independent instrument based on ISO 20022 XML, used to any open matching platform such as the SWIFT Trade Service Utility platform. It accounts for a legally binding, valid and enforceable payment obligation of the obligor bank to the recipient bank under the standard of law.

Bank payment obligations provide for various SCF services during the earlier lifecycle of transactions, both pre- and post-shipment finance opportunities, at a more favourable rate. These financing propositions include both letters of credit as well as open account trade like factoring, forfeiting, and reverse factoring/approved payables financing. The bank payment obligation makes it possible for involved banks to identify triggers for the provision of risk mitigation and SCF opportunities based upon the electronic matching data as can be seen in table 3.2.

Table 3.2: Trigger points for the provision of financial supply chain services.

Supply Chain Trigger Points	Bank Processing Opportunity	Bank Financing Opportunity
Purchase Order agreed	Purchase Order Advice	Pre-Shipment Finance
Goods warehoused	Document Checking/ Data Matching	Warehouse Finance
Documents Issued	Documents/Purchase Order Reconciliation	Receivables Purchase
Documents presented	Document Checking/ Data Matching	Post-Shipment Finance
Documents approved	Management of Approved Documents	Approved Payables Finance
Due date	Document Payment	Repay any outstanding financing

Source: International Chamber of Commerce, 2013.

The bank payment obligation follows a four-corner model between the seller's bank, buyer's bank, the seller, and the buyer rather than a three corner model where only the seller, buyer, and buyer's bank are involved. There are three major actions that are completed for a successful bank payment obligation: Baseline establishment, Matching, and Settlement.

3.5 Working Capital Requirements and Income Differences

During the production of table grapes large costs are being incurred. Due to the nature of the export supply chains the time it takes for payment from the customer for goods shipped is delayed. In the meantime the cost of production is on-going and the time element of cash availability to pay these costs constrains the farmer. In this section the author examines the cost of table grape production that lead to the need for SCF. In the cost breakdown presented of the various industries only the total cash expenditure is investigated. The total cash expenditure excludes the provision for renewal, licences and insurance, and taxes.

3.5.1 Working Capital Requirements

Figure 3.4 shows the production cost increases of table grape producers from 2010 to 2012. The production cost of table grape farmers increased annually from 2010 to 2012. The production cost increased with approximately 14% from 2010 to 2012, there has been an average increase in production cost of 7% annually over three years (SATI, 2013).

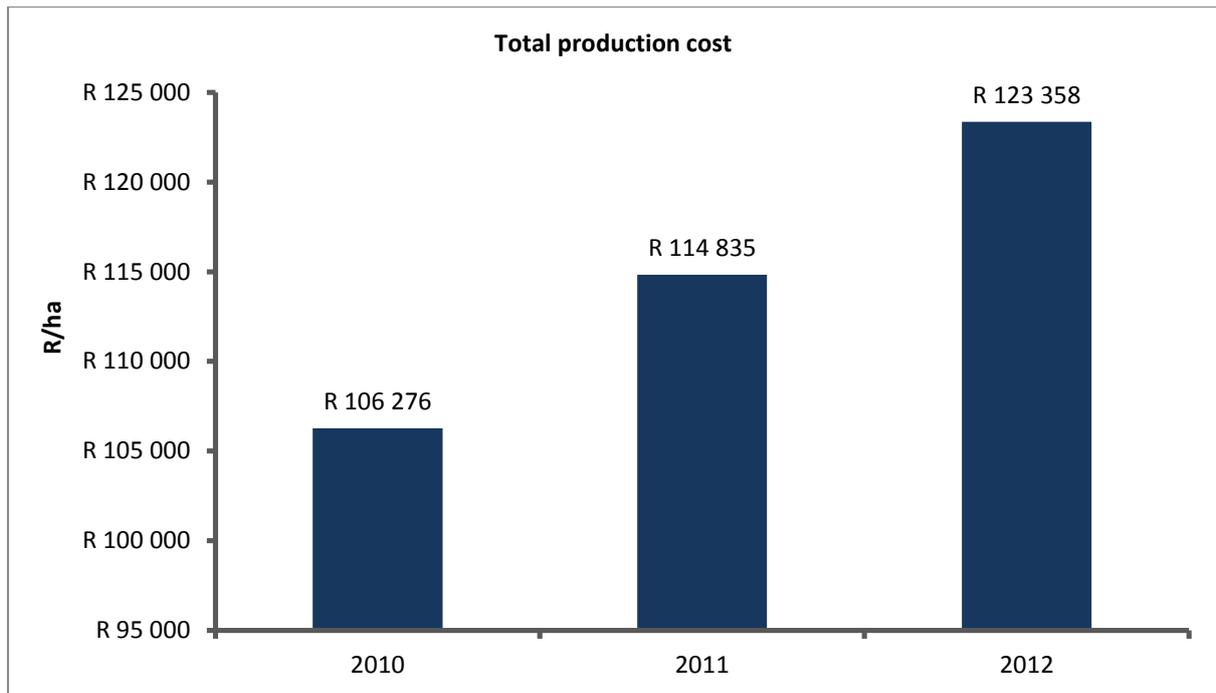


Figure 3.4: Total Production Cost
Source: SATI, 2013.

Table 3.3: Cost Breakdown of Table Grape Production.

DIRECT PRODUCTION COSTS	R/HA
FERTILISER	7,178
PESTICIDE CONTROL	10,671
LABOUR	73,546
FUEL	7,557
REPAIR, PARTS & MAINTENANCE	7,509
ELECTRICITY	9,011
WATER COSTS	1,400
ADMINISTRATION	6,486
TOTAL CASH EXPENDITURES	123,358

AVERAGE PACKOUT @ 3900/HA	R/4.5KG EQUIVALENT
PACKAGING MATERIAL	13.6
TRANSPORT	2.57
INSPECTIONS & LEVIES	0.83
OTHER	3.12
TOTAL MARKETING COSTS PER 4.5KG	20.12

Source: SATI, 2013.

To put this cost breakdown of table grape producers into perspective the total working capital that is required by the farmer to export table grapes to the UK or Europe without acquiring financing will be

illustrated. The figures used in the next section are a combination of the figures in table 3.3 and table 3.4.

Table 3.4: Cost/4.5kg Equivalent Cartons & CIF Cost/ha.

PRODUCTION COST	R50 / 4.5KG EQUIVALENT CARTONS
SHIPPING & LOGISTICS COSTS	+R23 / 4.5KG EQUIVALENT CARTONS
COST CIF ROTTERDAM	=R73 / 4.5KG EQUIVALENT CARTONS
TOTAL CIF COST/HA @ 3900 PACKOUT	R284700/HA

Source: Louw, 2014; SATI, 2013.

The production cost for the farmer is R50 / 4.5kg equivalent cartons, while the shipping and logistics costs are R23 per 4.5kg equivalent cartons (Louw, 2014). Adding the production cost per 4.5kg equivalent cartons to the shipping and logistics costs per 4.5kg equivalent cartons totals the CIF Rotterdam cost per 4.5kg equivalent cartons. The CIF Rotterdam cost per 4.5kg equivalent cartons equals R73.

Packaging materials is one of the costs that farmers obtain external finances for, since it is one of the highest costs. If only the cost of packaging materials is considered at an average packout of 3900 4.5kg equivalent cartons the total cost of packaging materials totals R53 040/ha. If the farmer has an average packout of 3900 4.5kg equivalent cartons per hectare based on table 3, then the farmer must have R284 700/ha working capital available if the farmer has the capability to use internal finances for exports.

To illuminate the significance of the working capital requirements even more these figures can be adjusted to the total average vines under production. The total average hectares under table grape production per farmer is 40ha (Own calculations from SATI, 2012). Thus the average table grape farm of 40ha requires R11 388 000 of working capital during the harvest season to be able to export table grapes with internal finance. The total working capital required to cover the cost of packaging materials alone is estimated at R2 121 600.

3.5.2 Income Difference

In the next section the difference of what a producer's profit per 4.5kg equivalent carton would be when exporting their products in case he has a) inadequate working capital to finance his own exports compared to what a producer's profit per 4.5kg equivalent carton would be and b) when he has enough working capital to finance his own exports. The difference in income from when farmers have adequate working capital to finance their own exports compared to when farmers have inadequate working capital to finance their own exports is illustrated in table 3.5.

Before the comparison is made it is important to point out the following assumptions:

- Figures are based on table 2 and table 3
- Figures are based on exports to Rotterdam, thus Euro is the currency
- The exchange rate is R14.50/€1
- Income equals €7.50 / 4.5kg equivalent carton for farmer that makes use of external finances
- Income equals €9 / 4.5kg equivalent carton for the farmer that makes use of internal finances

In case a) where the farmer has inadequate working capital to finance his own exports he would typically make use of a production loan to finance exports. This option will mitigate the cost and thus the risk of the farmer. The selling price of €7.50 / 4.5kg equivalent cartons are not earned all at once, it is divided into €4 and €3.50 that will be realised on two occasions. The farmer will get the €4 / 4.5kg equivalent cartons in October to cover part of the production cost of R50 / 4.5kg equivalent cartons. The remaining €3.75 / 4.5kg equivalent cartons is earned in March which covers the shipping and logistics costs of R23 / 4.5kg equivalent cartons with a margin added. The farmer would get an income of R108.75 / 4.5kg equivalent cartons ($€7.50 * R14.50$) and realise a profit of R35.75 / 4.5kg equivalent cartons ($R108.75 - R73$).

In case b) where the farmer has adequate working capital to finance his own exports the farmer would typically make use of an advance payment SCF option to improve cash flow to cover certain expenses. This option will cover some of the shipping costs during the export process to make cash flow available. The farmer gets a total of €9 / 4.5kg equivalent cartons from the importer. This €9 is divided into an advance payment of €4 / 4.5kg equivalent cartons (R58) received from the importer during week 12. The R58 / 4.5kg equivalent cartons is used to pay the R23 / 4.5kg equivalent cartons shipping cost while the farmers carry the production cost themselves. A final payment of €5 / 4.5kg equivalent cartons is only received during week 21 but is much higher than in scenario b) because the farmers is not reliable on the production loan of importers. The total that the farmer receives is R130.50/4.5kg equivalent cartons ($€9 * R14.50$) and he realises a profit of R57.50 / 4.5kg equivalent cartons. The problem with this method is that the majority of the time the final payment is equal to the advance, the farmer receives no margin added to the total (Louw, 2014).

The difference in profit realised in the two cases is R21.75 / 4.5kg equivalent cartons in the favour of the farmer that has adequate working capital available to export his grapes. The farmers that does not have adequate working capital to export his grapes would traditionally have to make use of a

production loan option usually from a bank and in the process receive less income per 4.5kg equivalent cartons for his grapes and thus realising a lower profit than the farmer with adequate working capital (Louw, 2014).

Table 3.5: Income difference from obtaining a traditional production loan and using internal finances with a once-off advance payment.

	EXTERNAL FINANCE	INTERNAL FINANCE
FINANCE OPTION	PRODUCTION LOAN	ADVANCE PAYMENT
SELLING PRICE	€7.50 / 4.5KG EQUIVALENT CARTON	€9 / 4.5KG EQUIVALENT CARTON
INCOME RECEIVED BY THE FARMER	R108.75 / 4.5KG EQUIVALENT CARTON (7.50*14.5)	R130.50 / 4.5KG EQUIVALENT CARTON (9*14.5)
SHIPPING & LOGISTICS COSTS	R23 / 4.5KG EQUIVALENT CARTONS	R23 / 4.5KG EQUIVALENT CARTONS
PRODUCTION COSTS	R50 / 4.5KG EQUIVALENT CARTONS	R50 / 4.5KG EQUIVALENT CARTONS
CIF COST	R73 / 4.5KG EQUIVALENT CARTONS	R73 / 4.5KG EQUIVALENT CARTONS
PROFIT	R35.75 / 4.5KG EQUIVALENT CARTONS	R57.5 / 4.5KG EQUIVALENT CARTONS
PROFIT DIFFERENCE	- R21 / 4.5KG EQUIVALENT CARTONS	+ R21 / 4.5KG EQUIVALENT CARTONS

Source: Louw, 2014.

3.5.3 Deduction

It is clear that the working capital requirements of table grape producers are very high and it is not possible for every table grape producer to have adequate working capital in terms of cash flow available internally. The result is often that table grape producers have to make use of external finances to release tied up cash flow in supply chains in a timelier manner. Table grape producers that are able to export their products with internal finances are able to realise more profit, *ceteris paribus*, than table grape producers that have to make use of traditional financing through banks.

3.6 Financing Needs throughout the Current Situation

The table grape export supply chains continue to lengthen as a result of globalisation and an increase in available foreign markets, and this phenomenon has led to a lot of farmers experiencing a reduction of capital availability and an increased pressure towards creating cash flow. There are a number of small scale farmers in the table grape industry that does not have the necessary

marketing spend and economies of scale to market and build brands. They rather have a demand to increase their cash flow to cover production costs early in the supply chain life cycle.

More often larger farmers also have a demand for cash flow increases, but not necessarily a demand to pay for operations but then again they rather want to reduce the opportunity cost by investing in an alternative source of income to increase the Return on Investment. Large scale farmers also want to increase their cash flow due to their related higher cost and thus have a larger working capital requirement.

Commercial banks form one of the most common ways to finance table grape export and obtaining credit from banks can be in the form of an overdraft that is negotiated with the bank or it can be a loan for a specific project. This tends to be a more traditional source of finance and is becoming less easily accessible and more expensive (ING Group, 2013a). The problem is that commercial banks do not want to take the risk of financing fresh products and thus it is difficult to be cleared for a loan.

Formal procedures necessary for international trade transactions can be extensive (Schmidt-Eisenlohr, 2013). The reason for this is that there is a delay from the cold store to the wharf until goods are ready to be shipped as well as a delay at the border of the importer. This implies that working capital requirements are larger for international trade than for domestic trade.

This resulted in the establishment of financing companies that specialise in fresh products to overcome problems faced during exports. These companies play an important role in the financing of deciduous fruit exports in South Africa. During an interview (see Appendix A) it is explained that a farmer has a need for financing no matter the size of the farm. Once a farmer has planted the grape vine it takes at least three years before it carries any fruit. During this two year period there is a large amount of capital tied-up and it is difficult for the farmer to achieve an adequate cash flow. The need for financing also continues for the farmers as the cost of planting and maintaining table grapes are very high compared to other fruit industries.

During another interview (see Appendix A) the need for financing is explained as, "The need for financing for farmers start on an early stage even before the harvest season, this type of financing is known as preseason financing. Preseason financing is basically when the farmer gets a percentage of the expected harvest in advance. The estimation of the total amount to be received in advance by the farmer differs depending on the contract. The farmer develops a need for a percentage of the estimated yield before harvest to have sufficient working capital to operate optimally."

Generating adequate working capital internally can be seen as the easier part of financing the supply chain, but it is important that CFO's should recognise that their suppliers, customers and distributors

may be experiencing the same cash flow pressures and may be in a weaker position to obtain financing (ING Group, 2013). This may lead to instability for both buyers and sellers. Buyers have a risk of interruption of essential supplies and could impact the distribution to customers negatively and thus reduce customer satisfaction. The revenue and working capital of the sellers are put at risk and sellers' cash flow is tied up in surplus inventory.

There is an existing conflict of interest between the buyers and the suppliers (Eloff *et al.*, 2013). The suppliers want the payment of goods supplied as early as possible, while the end-buyers want to delay the payment to the suppliers for as long as possible. The suppliers want to generate cash flow in terms of sufficient working capital by getting early payment and the end-buyers want to earn a mark-up when selling their products to customers before paying their suppliers. This conflict of interest also leads to the need for SCF to be able to cater for the needs of both the buyer and suppliers. Suppliers are able to receive payment early from banks or financial service providers while buyers can pay the suppliers on the original trade agreement.

The need for financing is much more prominent during exporting compared to when the product is sold domestically. The reason for this is that the supply chain is exceptionally longer during exports and a lot more parties are involved which makes it more complex than domestic supply chains. Due to the fact that 86% of table grapes are exported and most of the time the payment terms determines that payment is made between 30-120 days translates into high expenses and slow income (SATI, 2012). The smaller exporters, more often than the larger exporters, face a major cash-flow problem because of these late payments while larger exporters can enjoy economies of scale.

During an interview (see Appendix A) with a company that provides financing to citrus and table grape farmers for exports, it was stated that 75%-80% of the exports are financed. This is a reflection of the extent to which a need for financing of fresh product exports exists.

Long production periods, seasonal peaks, high risk, high ratio of inventory that accounts for working capital and slow capital recovery are all characteristics of the table grape export supply chains (Department of Agriculture, Forestry & Fisheries, 2012). These characteristics often lead to the need for finance during production, processing and/or sales. After the final draft of an export plan is completed it is essential to determine how the exports will be financed.

The difficulty in tracking the shipment of orders and the degree in which congestion can occur lead to buyers that cannot accurately predict when shipments will arrive and payments are due (CGI Group, 2007). This leads to buyers that are holding higher levels of inventory or producing more than are demanded to prevent stock-outs and thus costs are increasing. At the same time buyers are

expecting longer payment terms from sellers that increases prices, jeopardises relationships with sellers and decrease the stability of the buyers' supply base.

The golden rule is inevitable that a farmer needs cash flow to operate without disruptions. In many cases the table grape export supply chains' cash flow problems start at an early stage. The farmer has a need for cash flow to be able to pay for new vines, irrigation and fertilisers. When the farmer don't have the cash flow to pay for these production necessities a loan or any type of financial support is required. In case of a start-up farmer that only have new vines it will take proximity three years to harvest for the first time. In those three years the farmer will need an income of any sort.

Not only start-up farmers' experience cash flow constraints-, established farmers experience it as well. They have large input costs and also wait a long period for payment from clients. The reason is simply because the end customers are located long distances from the farmer and the grapes take a long period of time to reach them. The two main input costs for table grape farmers are labour costs and packaging costs that lead to high working capital requirements.

When a farmer does not have the internal cash flow to accommodate these costs they approach a financial service provider, export agency, or a bank to help them gain access to working capital (Louw, 2014). An export agency is seen as financing means towards meeting the customer's demand. The export agent guarantees a fixed price for the farmer and is sometimes risky for the farmer and the export agency. The farmers could in some cases earn more for their products and the export agencies have to pay the farmer more than the market price. In some cases the end customer finances the export agency and then the export agency finances the farmer. This occurs because of the low interest rate in foreign countries.

The transmission time of shipping documents during ocean freight alone develops a need for finance. The B/L being the title property of goods, the consignee must be in possession of one of the originals by the time the vessel reaches the port of destination (UNDP, 2008). Transmission time can be calculated as follows:

Table 3.6: Transmission time

Activity	Time to complete
Retrieval of B/L from carriers and airmailing	2-6 days

Airmail from origin to buyer	2 days
Processing, checking and issue of dispatch	2 days
Notifications at the buyer's organisation (This is considered a minimum, it can take longer in case of public holidays, leave, sickness or seasonal pressure of work)	7 days
Transmission by airmail field, or by airmail or courier from London Gateway to Paarl	7 days

Source: UNDP, 2008.

Thus the minimum total transmission time is approximately three weeks, often longer as can be seen in table 3.6. This can translate into an even bigger financial issue when making use of letters of credit to finance exports. The already lengthy process of letters of credit can be extended by the transmission time regarding the submission of documents. When the documents are couriered to the buyer and there is a documentation error there are two ways to go about i.e. to amend the bill of lading and pay an amendment fee or to amend the letter of credit and pay a letter of credit discrepancy to the bank.

There are various factors that lead to a need for financing during the exports of table grapes. Some farmers experience the need for financing in a very early stage of the supply chain while other farmers experience a need for financing later in the transaction life cycle. The main reason that table grape producers have a need for financing is the long duration for goods to reach the end-customer and thus receiving their final payment very late, while operational costs are on-going.

3.7 Implementing SCF

SCF can be seen as a management and decision making innovation. Rogers (2003) recognised that organisations face an innovation-adoption process consisting of several stages of decision making. Wuttke *et al.* (2013) adapted the innovation adoption stage model from Rogers (2003) with the focus on SCF.

The model is divided into two phases, initiation and implementation. During the initiation phase the organisation (also other supply chain partners) requires certain generic strategic priorities to be interested in SCF (Wuttke *et al.*, 2013). Once the initiation phase is complete a decision must be made whether to implement SCF or not. During the implementation phase Wuttke *et al.* (2013) developed four sets of propositions that characterise the SCF adoption process and are divided into

an initiation phase and implementation phase presented in figure 3.6. The four sets of propositions of Wuttke *et al.* (2013) are described below:

Proposition 1: Redefining and restructuring.

Restructuring of organisations internally and redefining the SCF innovation according to the supply base needs are interrelated and mutually enforcing processes in the sense that neither alone can be successful without the other process advancing.

Proposition 2: Effectiveness of restructuring and redefining.

The interrelated progress of restructuring and redefining is moderated (a) by logistics/procurement-finance alignment and (b) by supplier involvement with the progress being more effective with higher levels of logistics/procurement-finance alignment and supplier involvement.

Proposition 3: Clarifying and disseminating.

Clarifying and disseminating are interrelated and mutually enforcing processes in the sense that neither alone can be successful without the other process advancing.

Proposition 4: Effectiveness of the upstream dissemination process.

a) SCF leverage has a positive impact on the dissemination of SCF in the sense that it increases the effectiveness of the dissemination process in the supply base.

b) Relational strength has a positive impact on the dissemination of SCF in the sense that it increases the effectiveness of the dissemination process in the supply base.

There should be a system in place to make the transition as easy as possible once the program has been initiated. The program should involve onsite or online training to all participants involved. There are various financial service providers available that provides all the training and on-boarding processes.

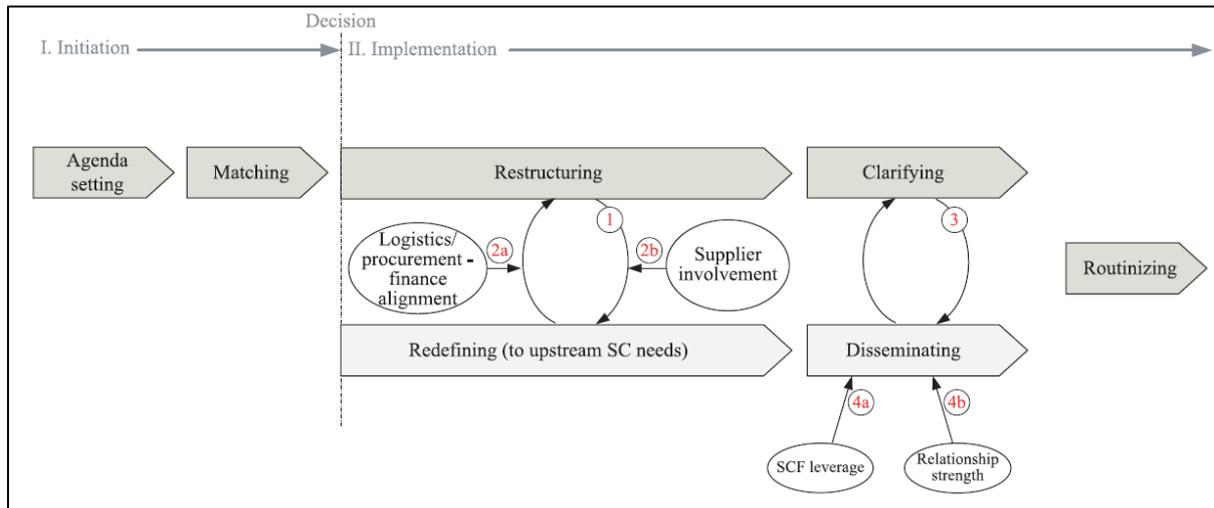


Figure 3.5: SCF Innovation Adoption Model

Source: Wuttke *et al.*, 2013.

Redefining SCF is a twofold process during which the firm not only adjust the SCF innovation to their specific environment but also need to reassess the appropriate factors to which the SCF innovation needs to fit. These factors will change as the market conditions and the organisation's needs change. Restructuring of the organisation's processes internally is focused mainly on inter-departmental collaboration (Wuttke *et al.*, 2013).

During the implementation of a SCF program it is required that multiple internal departments are coordinated (Global Business Intelligence, 2012). In order to make the implementation process run more efficiently it is recommended that the implementation team exist out of directors from different departments and that the team has a champion to lead the implementation process. It is important to not only have internal coordination but to engage with the partnering organisation's functional divisions.

Logistics, procurement, and finance are three key divisions that form the SCF team. It is also additionally recommended that the IT and legal department is involved to integrate the ERP systems to enhance compliance and that accounting statements are accurate.

Clarifying and disseminating SCF is the process to make everyone involved aware of the program and persuade them to get on board with the program. This involves convincing the upstream and downstream supply chain partners to make use of SCF (Wuttke *et al.*, 2013).

It is also important to be effective with the dissemination process in the supply base. Supply chain leverage is an important tool towards promoting effective dissemination. An example of supply chain leverage is to have another source of financing (Wuttke *et al.*, 2013). Buyer-supplier relationships also play a pivotal role for effective dissemination of SCF. Three attributes define

relationship strength: trust, buyer-power and communication obtrusiveness. Thus SCF will not work for all organisations and they will need SCF leverage and relational strength to become effective adopters (Wuttke *et al.*, 2013).

When a company decides to implement a SCF program with a collaborative partner there are several factors to keep in mind which will ensure that both buyers and suppliers leverage the advantages.

It goes without saying that e-invoicing should be implemented especially during international trade (Tavan, 2012). Working capital can be improved by switching to electronic invoicing. Depending on the size and volume of invoicing, the cost of paper transactions can be one-fifth more than the cost of e-invoicing.

It is essential to build supplier relationships with suppliers that will understand all the implications involved in SCF (Greensill, 2011). The suppliers must trust the buyer and the buyer's bank and vice versa. The program won't be successful if trust is not earned by all parties involved.

If the SCF model requires a banking partner it would be more beneficial to choose one that has international recognition and geographic coverage that will make international trade easier (Greensill, 2011). Choose a proven bank or financial service provider to reduce the risk of implementation failure.

The right technology platform can be essential to the on-going success of the program, however not all SCF models requires a technology platform. The technology platform must be easy to use and accessible to all parties. The system needs to be integrated with the buyers' and sellers' internal systems to optimise the purchase-to-pay process (Greensill, 2011).

The SCF provider must be able to deliver the service as it is demanded by the buyers and have the financial strength to finance the program without difficulty. Companies that have implemented SCF in the past have had scalability problems (Greensill, 2011). This means they have reached their credit limits and are not able to be financed any further. When choosing the financial service provider the company should examine its own as well as the suppliers' credit needs in reaching their working capital objectives.

3.8 Credit rating

The main financial challenge for supply chain management is how organisations can use the information in a supply chain and the different financial positions of suppliers and customers to

optimise financing and cash flow for a single organisation and the supply chain as a whole (Gomm, 2010).

The interest on any credit is a reward for the underlying risk, thus the lower the expected risk the lower the interest rate (Gomm, 2010). A principal-agent problem exists when it comes to the provision of capital. The companies (agents) in a supply chain need cash flow from banks or capital markets. These providers of capital (principles) normally do not form part of the supply chains and have less information than the organisations in the supply chains. The first step would be to provide the providers of capital with the information to better evaluate the risk and to reduce the agent-principal problem. However some of this information should or cannot be communicated externally, thus only the company with this information can use it to evaluate and lower the risk related to the specific company. If these companies provide capital themselves they could do it at a lower interest rate than external providers. The principal-agent problem is reduced by lowering the risk and thus the interest for capital by turning information in the supply chain into value (Gomm, 2010).

Rating the customer's credit situation is very important during the decision to use SCF as a cash flow solution to table grape producers. In SCF models the buyer's credit rating is usually evaluated to assess the risk of default, rather than the table grape producer's credit rating. This contributes to the characteristic of SCF to mitigate risk in the supply chain.

There are usually two different types of ratings that credit rating agencies provide. Issue-specific credit ratings are current opinions of creditworthiness of an obligor with respect to a specific financial obligation, a specific class of obligation, or specific financial program (Trueck *et al.*, 2009). Issue-specific credit ratings also take into account the ability to recover the specific debt that is being rated. Issuer credit ratings give an opinion of the obligor's overall capacity to meet the financial obligations, also known as fundamental creditworthiness (Trueck *et al.*, 2009). To put the term credit rating in context with SCF it can be seen as the process of evaluating the clients' financial statements in an attempt to determine if they will be able to pay back the financing provided.

To make the rating process easier, rating scales were developed to determine what the risk of investment is for a specific client. There are long-term rating scales and short term rating scales that the majority of credit rating organisations determine separately. For the purpose of the study only the long-term rating scales will be further investigated. In the table 3.7 the different rating scales are identified and defined.

Table 3.7: Credit Rating Scales and Definitions.

Rating	Definition
AAA	The obligor's capacity to meet its financial commitment on the obligation is extremely strong
AA	An obligation rated AA differs from the highest rated obligation to a small degree. The obligor's capacity to meet its financial commitment is very strong.
A	An obligation rated A is somewhat more susceptible to the adverse effects of changes in the circumstances and economic conditions than obligation in higher rated categories.
BBB	An obligation rated BBB exhibits adequate protection parameters. Adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity to meet its financial commitments of the obligations.
BB	An obligation rated BB is less vulnerable to non-payment than other speculative issues. It faces major on-going uncertainties or exposure to adverse business, financial, or economic conditions that could lead to the obligor's inadequate capacity to meet the financial commitment on the obligation.
B	The obligor currently has the capacity to meet its financial commitment on the obligation. Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet financial commitments.
CCC	An obligation rated CCC is currently vulnerable to non-payment, and is dependent upon favourable business, financial, and economic conditions for the obligor to meet its financial commitment on the obligation.
CC	An obligation rated cc is currently very vulnerable to non-payment.
C	The C rating may be used to cover a situation where a bankruptcy petition has been filed or similar action has been taken but payments on this obligation are being continued.
D	The D rating is not prospective. It is only used where a default has occurred and not where a default is only expected.

Source: Trueck *et al.*, 2009.

The ratings from AAA to BBB are recognised by the majority of organisations as investment grades while ratings from BB and below are recognised as being speculative and thus noninvestment graded.

Although the financial statements of the client are the single most important consideration during the rating process, there are also other factors to be considered. The rating is ultimately an opinion based on quantitative and qualitative factors. During the interviews conducted for this study, in two interviews conducted on separate occasions, it was made clear that the financial position of the client is an important consideration but they also pointed out that they base their decision to finance the client on the client's appearance, history in terms of past business, the farm's condition and the way the farm is being operated.

3.9 Trade Agreements

The International Chamber of Commerce has developed Incoterms® 2010 to provide international recognised standards and definitions that are most often used during international and domestic contracts for the sale of goods (International Chamber of Commerce, 2013). Incoterms® 2010 are trade agreements between the seller and buyer during the sale of goods to determine at what stage the consignment are handed over and who is responsible for the transportation costs. It is very important to determine who is responsible for transport costs and when ownership is handed over from the seller to the buyer during the decision to buy goods from a supplier, because if something unexpected happens during the shipment of the goods the party that is liable for the damage is identified. Incoterms® 2010 and SCF has a close correlation-, Incoterms® 2010 will determine up until what stage the exports are financed and by whom.

There are numerous Incoterms® 2010 to choose from and these can be divided into two classes as can be seen in table 6: rules for any mode(s) of transport and rules for sea and inland waterway transport (International Chamber of Commerce, 2013). Incoterms® 2010 are important elements to exporters since it forms a critical tool for managing risk. Incoterms® 2010 also represent a cost to the exporters which may impact the feasibility of the export (Department Agriculture, Forestry and Fisheries, 2010).

3.9.1 Types of Incoterms

There are four groups that each type of Incoterms® 2010 can be categorised by (Department Agriculture, Forestry & Fisheries, 2010). There is only one type of trade term in the Group E classification namely Ex Works. The Group F classification indicates the obligation of the seller to hand over the goods to a carrier free of risk and expenses to the buyer. During the C-Group trade terms the seller's obligation to bear certain costs after main carriage is indicated. This is an important point in the contract because the obligation to bear risks and costs change from one party to another. The last group, Group D, are trade terms that includes the specified destination where goods must have arrived.

There is a direct relationship between the type of Incoterms® and SCF. The type of Incoterms® 2010 will have a financial impact on the buyer and the supplier in terms of the payment period, since the selected incoterm will determine the date that the ownership of goods will transfer from the supplier to the buyer.

To put the correlation between Incoterms® 2010 and SCF into perspective a practical example is given. Consider Ex Works and Delivered Duty Paid terms and assume a supplier will make shipment

on ETD 1 January 2014 and it will take 21 days to reach the buyer, assuming no delays, and a payment term of 14 days was agreed upon. During Ex-Works terms the ownership will be transferred when the supplier ships the goods on 1 January. The moment the value of the goods and the account payable are both registered on the buyer's balance sheet, the payment has to be processed no later than 14 January 2014.

In the case of Delivered Duty Paid terms the ownership will be transferred when the goods arrive in the buyer's warehouse on 21 January 2014. On this date the account payable and current assets will be registered, but the buyer is obligated to pay before 5 February 2014 (Tian, 2014).

Both these are extreme examples to emphasise the difference in Incoterms® chosen. Also during table grape exports these time frames should be adjusted because of the time it takes for quality checks and processing documentation. Figure 3.8 shows all the E-terms and F-terms that are part of the Incoterms® 2010.

Table 3.8: Transfer of obligations for charges and risk during E and F terms.

	E-terms Origin	F-terms Freight Charges not Paid		
Sales Terms	EXW Ex-Works (Place)	FCA Free Carrier (Place)	FAS Free Alongside Ship (Port)	FOB Free On Board (Port)
Services	Responsibility & Charges			
Warehouse Services	Seller	Seller	Seller	Seller
Export Packing	Seller	Seller	Seller	Seller
Origin Loading	Buyer	Seller	Seller	Seller
Inland Freight	Buyer	Seller	Seller	Seller
Port Rec Charges	Buyer	Seller	Seller	Seller
Forwarder Charges	Buyer	Seller	Seller	Seller
Ocean/Air Freight	Buyer	Buyer	Buyer	Buyer
Dest Port Charges	Buyer	Buyer	Buyer	Buyer
Customs Clearance	Buyer	Buyer	Buyer	Buyer
Customs Duties	Buyer	Buyer	Buyer	Buyer
Dest Delivery Charges	Buyer	Buyer	Buyer	Buyer
	Risk & Responsibility Transfers			
Risk Transfers	At Warehouse Named Place	On Truck at Named Place	At Named Port Alongside Ship	At Named Port On Board Ship

Source: Allegro Freight Services, 2014.

When table grapes are shipped Ex-Works, goods are made available at the seller's premises (or any other named place) for collection by the buyer with minimum obligation to the seller for transporting the goods to the buyer. At this point the responsibility of the risk is transferred to the buyer and he has an obligation to clear the goods for export and pay all costs involved for transportation including insurance. The seller does not have to load the goods on a collecting vehicle or have to clear the goods for export (International Chamber of Commerce, 2013).

The seller arranges delivery of the goods cleared for export to the chosen carrier as nominated by the buyer and is responsible for the risk and costs up to the named point of handover during Free Carrier terms (International Chamber of Commerce, 2013). The only difference between Free Carrier, Free Alongside Ship and Free on Board terms is the point at which the risk transfers. During Free Alongside Ship terms the seller is responsible to deliver the goods alongside the vessel at the named port of shipment as nominated by the buyer. The buyer is responsible for all costs and risk from this point onwards (International Chamber of Commerce, 2013). When Free On Board terms are used the seller is responsible for the clearing and the delivery of goods for export on board the vessel to the designated port. Once the goods have passed over the ship's rail at the port of loading the risk is transferred to the buyer (International Chamber of Commerce, 2013).

Table 3.9 Transfer of obligation for charges and risk during C and D terms.

Sales Terms	C-terms Freight Charges Paid				D-terms Destination/Arrival		
	CFR Cost & Freight (Port)	CIF Cost, Freight & Insurance (Port)	CPT Carriage Paid To (Place)	CIP Carriage & Insurance Paid To (Place)	DAT Delivered At Terminal (Place)	DAP Delivered At Place (Place)	DDP Delivered Duty Paid (Place)
Services	Responsibility & Charges						
Warehouse Services	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Export Packing	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Origin Loading	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Inland Freight	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Port Rec Charges	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Forwarder Charges	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Ocean/Air Freight	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Dest Port Charges	Buyer	Buyer	Buyer	Buyer	Seller	Seller	Seller
Customs Clearance	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Seller
Customs Duties	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Seller
Dest Delivery Charges	Buyer	Buyer	Buyer	Buyer	Buyer	Seller	Seller
	Risk & Responsibility Transfers						
Risk Transfers	On Board Vessel at Port of Shipment	On Board Vessel at Port of Shipment	On Board Vessel at Port of Shipment	On Board Vessel at Port of Shipment	Unloaded at The Port/Cargo Terminal at Named Place	On Delivering Carrier at Named Place	On Delivering Carrier at Named Place, Duty & Tax Paid

Source: Allegro Freight Services, 2014.

The place and party to which the risk, responsibility and charges is transferred during C-terms and D-terms are illustrated in table 3.9. The freight charges are paid by the seller when C-terms are used and all the C-terms are very similar besides technical differences in costs that are paid by the seller. Cost and Freight terms state that the seller bears all the risk involved with the shipment of goods to the port of destination. The seller is also responsible for the cost and freight charges at the port of destination (International Chamber of Commerce, 2013). Cost, Insurance and Freight terms identify that the seller is responsible for the all costs, insurance and freight charges for delivering the goods to the named port of destination and bears all the risks involved of goods in transit (International

Chamber of Commerce, 2013). When Carriage Paid To terms is used the seller has a responsibility to deliver goods to the appointed carrier at the named port of destination (to the carrier or other person) at the seller's expense. The responsibility of risk is then passed onto the first carrier up to the named place of delivery and the cost of the goods are allocated to the seller until the goods arrive at the named destination to the point where carriage has been paid (International Chamber of Commerce, 2013).

The seller undertakes to deliver the goods to their appointed carrier to the named port of destination, including insurance at the seller's expense when the shipping terms are Carriage and Insurance Paid To. The responsibility of the risk is then passed onto the first carrier up to the named place of delivery and the seller is accountable for the cost of the goods until the goods arrive at the named place to where carriage has been paid. The buyer should take note that the seller is required to obtain insurance only on minimum cover (International Chamber of Commerce, 2013).

According to Delivered at Terminal shipping terms the seller is held responsible for unloading the goods from the arriving means of transport at a named terminal at the named port or place of destination. All the risks and transportation of the goods to and unloading the goods to the named terminal are carried by the seller (International Chamber of Commerce, 2013). When Delivered at Place terms are the negotiated terms of a shipment, the seller clears and places the goods for export at the buyer's disposal, unloaded at the named place of destination and bears all risks for the transportation up to this point (International Chamber of Commerce, 2013). Delivered Duty Paid incoterms entails that the seller agree to deliver the goods to the buyer's named place of destination ready for unloading and cleared for import on the arriving means of transport. The seller bears all the costs and risk of bringing the goods to the named place of destination. The seller also has an obligation to clear all the goods for import and export and bears all cost of any applicable duty for imports and exports and to carry out any customs formalities (International Chamber of Commerce, 2013).

3.10 The Table Grape Supply Chain and Processes

One of the goals of this section is to identify the time it takes from production to the time the table grapes are received at the port of destination. This is an important aspect of the research since one of the objectives is to improve the cash-to-cash cycle time. This section will also give an indication if there is any inefficiency in the network configuration of table grape supply chains

It is important to note that observations were made on two occasions over five days. The observations were made in only one of the four packing facilities of two cultivars and observations were made twice in the port. This has led to take the average completion time of all the processes observed. Also it is important to keep in mind that during the observations 24 pallets were packed on average which is four pallets more than a container load.

In the next section the cold chain and all the processes to form a complete table grape supply chain, from the moment the fruit is being produced until the container is shipped will be explained in detail based on observations made on the table grape farms.

3.10.1 Production

The core business of producers is to produce a high quality crop. It is important that the producers are reliable, consistent and agile to adapt to changes in the cultivars demanded (Department Agriculture, Forestry and Fisheries, 2012). There is much that needs to be done before the picking of the fruit actually can begin. This can be seen as the preparation phase of growing the fruit.

In the case of new vines being planted the soil must be nourished with the adequate nutrients. The decision on where the vines will be planted must also consider the landscaping of the farmland. Some varieties prefer a certain gradient at which the vines must be planted. Weed killers and fungicides are sprayed over the crops during different growing phases of the crop. The reason is simply to prevent the weeds from taking the needed nutrients from the fruit.

There are certain export standards that have to be complied with in terms of the size and sweetness of the fruit. Bunches must thus be trimmed to ensure that the fruit consumes the nutrients it needs and the standards are met.



**Figure 3.6: Some bunches are trimmed to ensure the fruit get the nutrients it needs.
Figure 3.7: The fruit that has not coloured must be trimmed from the bunch.**

3.10.2 Picking

The picking of the table grapes is a very important part of the table grape supply chain since the timing of the picking of the grapes will determine the shelf life. The picking of the grapes can only commence during the cooler part of the day, usually early mornings. Once it gets too hot the picking process stops and continues the next morning.

Maturity indexing is the process to determine when the grapes are ready to be picked. The maturity of the fruit can be determined by internal and external factors (Fruit South Africa, 2004). The colour, size, as well as the firmness of the grape are external factors to determine the maturity of the grapes and if pickers are still not sure if the grapes reached maturity they can taste the fruit. Determining the sugar level is an internal factor to establish maturity of the grape and is done by using a refractometer. The PPECB also make use of calibrated refractometers to ensure that the table grapes to be exported are of sufficient quality and comply with the standards. After the observation of the supply chain from the vines to the port it was identified that the average time to pick grapes take on average nine hours that is equal to the maximum working hours. Over the 5 days on the farm an average of 24 pallets was picked per day which is equal to one container.



3.8



3.9

Figure 3.8: The BRIX (sugar level) of the grapes is tested by a refractometer.

Figure 3.9: Bunches are packed into crates once the PPECB has tested the sugar level.

3.10.3 Packing

Once the grapes are picked and loaded onto the trailer, the grapes are moved to the pre-cooling room in the packing facility. After the fruit has been cooled down in the pre-cooling room after it has been picked it is ready to be packaged. Most of the time the fruit in the crates is moved by means of a conveyer belt straight from the pre-cooling room to the pack house. The quality and size of the grapes are tested as it enters the packing area. Part of the packaging process is to remove fruit from

the bunch that do not comply with the standards, and these are usually malformed and bruised fruits. The grapes are then categorised either into grade 1 fruit (export) or grade 2 fruit (sold locally). The grapes are then weighed and adjusted (if necessary) to 500g punnets and packed into 4,5kg or 9kg cartons depending on the preference.



3.10



3.11

Figure 3.10: The crates are transported on a trailer to the holding room.

Figure 3.11: The crates are moved to the holding room before it is ready to be packaged.

The average time to pack the grapes also required a whole day's work, which is equal to 9 hours. The total average grapes packed in one day's work equals 24 pallets. Denau Farming has dedicated picking and packing teams thus the picking and packing processes combined equals one day.



3.12



3.13

Figure 3.12: The crates are moved from the holding room to the packing facility by conveyer belt.

Figure 3.13: The damaged grapes are removed from the bunch.



Figure 3.14: After the cartons are weighed and adjusted, the bunch is packed into punnets depending on the preference of the customer.

3.10.4 Cool Storage

The cold storage operator is mainly responsible for cooling the table grape to the required temperature as demanded by the customer. The grapes are force cooled to -5°C and should be kept at this temperature at all times not allowing a break in the cold chain. A thermocouple is inserted into a single grape at the centre of each pallet to track the temperature of the grapes throughout the entire shipment. The cold storage operator is also responsible for receiving, handling and loading the correct fruit into a truck as the customer has specified. The cold storage manager must make sure the fruit is registered or approved by the Perishable Produce Export Control Board (PPECB) (Department Agriculture, Forestry and Fisheries, 2012).



Figure 3.15: The pallets transported to the cold storage facility with a fork lift.

Figure 3.16: The pallets are stored in two rows creating a tunnel so that the air can flow freely, cooling every pallet.

The average time that grapes are kept in cool storage is three days due to temperature regulations. The time that pallets are stored in cool storage is also dependent on the total number of pallets of

the specific ordered by the buyer. If a single buyer ordered more than 24 pallets the time that the grapes is stored will be longer than one working day since the labourers are only able to pack 24 pallets in a day's work.

3.10.5 Exporter (Agent)

The exporter is responsible to market and sell the table grapes of the primary producers at the best market price they are able to negotiate with the potential buyers. Communication with key role players in the supply chain is important to realise this. The table grape farmers send production volume estimates to the exporter at the start of the season. An attempt is made by the exporters to match the estimates with the demand of table grapes in the foreign markets (Louw, 2014). Once this process is completed a provisional export plan is conducted which is sent to the shipping line to reserve adequate space and/or containers. As the season comes to an end more accurate estimates are made by the importers (demand) and producers (supply) to establish the final space needed for shipment.

The Fresh Produce Exporters' Forum (FPEF) is the main organisation in South Africa that is responsible for the export of fruit. The exporters are accountable for the quality of the fruit that is received by the buyers in the destination market (Department Agriculture, Forestry and Fisheries, 2012).

3.10.6 Transporter and Carrier

The transporters of the table grapes play an important role in the fresh fruit supply chain by ensuring the physical flow of fruit between the points of origin to the point of destination. The fruit in transit must maintain the correct temperature from the point of origin to the point of destination. This is usually between the producers, cold stores and terminal operators (Department Agriculture, Forestry and Fisheries, 2012).

Transport can be divided into road transport and sea freight shipping. Containers are transported by trucks from cool storage to the port. Shipping lines are accountable for shipping the containers from the port of origin to the port of destination. After observing the supply chain of Denau Farming it was found that the average time to transport a single container to the Cape Town Container Terminal is five hours.

It was not possible for the author to follow the grapes to the port of destination, however according to Louw (2014) the average time it takes the vessel to reach the port of unloading (London Gateway

in this case) is 23 days. This can take even longer if there is congestion at the port or if the vessel is unable to berth due to the natural elements.



3.17



3.18

Figure 3.17: The container is packed ready for transport.

Figure 3.18: Full TEU transported.

3.10.7 PPECB

The PPECB is responsible for the control of the perishable products intended for export from the Republic of South Africa according to the PPECB Act 9 of 1983. The PPECB is in control of the cold chain, even during the shipping process. The PPECB makes sure that the correct quality standards are met according to export quality specifications. As the emphasis on food safety and a demand for high quality products is increasing the role of the PPECB is becoming more important in the export of table grapes from South Africa (Department Agriculture, Forestry and Fisheries, 2012).

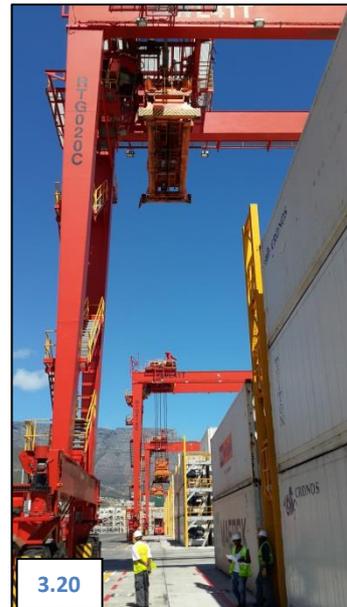
3.10.8 Terminal Operators

Two types of terminals are used to export table grapes: the Fresh Produce Terminal and the Container terminal. Terminal operators must communicate to all the relevant parties in the supply chain if there are port related delays such as labour strikes, wind delays, plug-in delays and other traffic congestion in the port that will influence the flow of the table grapes from and into the harbour (Department Agriculture, Forestry and Fisheries, 2012). Thus shipping lines, terminal operators and exporters must coordinate and communicate frequently.

The shipping lines will inform the exporters when their vessel is expected to berth. If the exporter has sufficient fruit ready for export the exporter book space on the vessel. The terminal operator is responsible for the movement of the pallets with forklifts from the vehicles to the cold rooms. Bar codes are located on each pallet to help the movers arrange the pallets according to the time and vessel on which it will be shipped.



3.19



3.20

Figure 3.19: Using straddle carriers to unload and move containers from trucks.

Figure 3.20: Using gantry cranes to unload and move containers from trucks.

Mostly reefer containers are used that have power supply plugs that can be connected at the port. Straddle carriers and Ship-to-shore cranes are used to move the containers at the port. The straddle carriers load the containers on bathtub trailers and are moved to the ship-to-shore cranes that will load the containers on the vessel. The whole process of unloading the container at the port, moving it to the temporary storage place and to finally load the container onto the vessel on average takes three days to complete.



3.21

Figure 3.21: Quay cranes loads the container from the quay onto the ship.

3.10.9 Deduction

From the observations of the table grape export supply chain it is clear that the high level processes are very time consuming and requires effective coordination. The total average time from the moment the grapes are picked to the point that the grapes arrives in the port of destination is 29

days. The picking and packing of the grapes is done at the same time by dedicated teams which mean that only one day is calculated for both activities. During this section a better understanding of the complexity of the physical supply chain of table grape exports and the time it takes from picking to the moment the container arrive in the port of destination was achieved.

3.11 SCF Stakeholders

The objective of the next section is to give a brief description of the main supply chain actors within the supply chain that can participate in SCF and the role that each play. This will be done in the context of the solutions that are currently available in South Africa. There are eight main categories of active players in SCF.

3.11.1 Banks

Banks are familiar with SCF instruments since the majority have been inherited from trade finance practices (Bryant & Camerinelli, 2013). The value added of financial institutions is in how products' structures can be best combined and offered in a specific environment of their corporate clients' supply chain. The overall benefit to the corporate customer of a certain SCF solution should be estimated and communicated.

Financial institutions are undoubtedly the most mature players in SCF and are continuously shaping and improving their SCF strategy in terms of supporting platforms, processes of the physical and financial supply chains, and the performance criteria of the people involved (Bryant & Camerinelli, 2013).

3.11.2 Non-bank Financial Providers

There are various multinational groups that have financial divisions that are active in the SCF arena. This multinational groups include factoring companies (the majority are bank-owned or affiliated), insurance companies (serves as secondary lenders and investors), and credit card providers (Purchasing Card and related services). The development of peer-to-peer lending operators made it possible for their clients to gain access through a web-portal (Bryant & Camerinelli, 2013).

3.11.3 Solution Providers

These players are also known as software application vendors and IT vendors, with experience in payments, cash management, workflow automation, and systems integration (Bryant & Camerinelli, 2013). These vendors are agile to market conditions and focus on automation. Often financial

institutions develop partnerships with and seek consultancy from vendors to address market opportunities.

3.11.4 B2B Networks and e-invoicing Service Providers

These operators exchange purchase orders and invoices electronically that lead to better collaboration between supply chain partners (Bryant & Camerinelli, 2013). These solutions may be offered in the operator's own right but generally partnerships are developed by banks and financial institutions.

3.11.5 Market Places and Hubs

Some vendors go beyond the development of enterprise applications and deploy platforms that enable collaboration among all participants in the SCF system. These participants include users, buy-side and sell-side financial providers, and other supportive actors (Bryant & Camerinelli, 2013). The platforms act as hubs that connect the systems of the various constituents.

3.11.6 Consultants and Analysts

These players are involved in SCF consulting and implementation services that relates to business strategy, market research, business models, marketing and systems development (Bryant *et al.*, 2013).

3.11.7 Logistics Service Providers

The logistics service providers are responsible for tracking, transparency and visibility, and collateral evaluation (Bryant & Camerinelli, 2013). Logistics service providers have visibility over goods in the physical supply chain which can reduce the financing associated risk. They are seen as value-adding since SCF is event-driven and logistics service providers can be the source of the triggers that enable SCF.

3.11.8 Industry Associations

Industry associations provide an infrastructure for market participants to exchange information, and to develop standards and market practices to overcome the risk of fraud and dispute (Bryant & Camerinelli, 2013). There is currently a lack of established rules, practices, infrastructure, and consistent standards. Some of the leading industry associations involved in SCF are-, International Chamber of Commerce, BAST-IFSA, and SWIFT.

3.12 The Table Grape Industry in Perspective

3.12.1 Background on the Table Grape Industry

South Africa has a long history of table grape production that has seen significant improvement over the last two decades. The gross value of table grapes has increased from R94 559 000 in 1985 to R3 54 264 000 in 2012 (Department of Agriculture, Forestry and Fisheries, 2013).

South Africa has been a reliable table grape supplier to the Northern hemisphere for more than a century and the pattern continues to hold true (SATI, 2013). South Africa's unique climate and diverse landscape contributes to producing table grapes of excellent quality.

The table grape industry is subdivided into dried grapes and fresh grapes. Fresh grapes forms the biggest part of the table grape exports in South Africa. The table grape industry operates in a deregulated environment since 1997, where the supply and demand market forces determine the market prices.

The table grape industry in South Africa is one of the most important role players in terms of foreign exchange earnings and job creation. The table grape industry employs approximately 50 000 labourers annually, which includes the permanent labourers and the seasonal labourers (SATI, 2014). The total labourers employed per production region per harvest season are presented in table 3.10.

Table 3.10: Number of farm workers employed.

Region Name	2010/2011		2011/2012		2013/2014	
	Seasonal	Permanent	Seasonal	Permanent	Seasonal	Permanent
Berg River	13,445	2,470	18,879	3,535	13,215	2,474
Orange River	14,802	1,943	16,874	2,156	12,971	1,274
Hex River	8,642	4,740	8,795	4,580	7,527	3,995
Olifants River	2,773	671	3,500	750	3,736	880
Northern Provinces	2,843	804	2,951	850	3,008	722
Total	42,505	10,628	50,999	11,871	40,457	9,345

Source: SATI, 2014.

The table grape industry is seasonal and thus the majority of employers is contracted during seasonal peaks. The permanent employees are usually skilled workers that are crucial to ensure the farms operate without problems.

3.12.2 Production Regions

South Africa has five major growing regions which include the Berg River, Hex River, Northern Province, Olifants River and Orange River regions. The difference in the climate and soil of these regions enables South Africa to provide the international market from November to May (SATI, 2012). Table 3.11 shows the different production regions and the total table grape producers per region.

Table 3.11: Number of table grape producers.

Region Name	2009/2010	2010/2011	2011/2012	2013/2014
Berg River	99	94	88	86
Orange River	99	103	74	65
Hex River	128	107	116	102
Olifants River	33	26	31	22
Northern Provinces	57	52	52	51
Total	416	382	361	326

Source: SATI, 2014.

The Hex River is the region with the largest production of table grapes and has the largest number of producers of all the production regions (SATI, 2014). De Doorns and Worcester combined produced 18 016 093 equivalent 4,5kg cartons of the total 18 431 899 equivalent 4,5kg cartons produced in the Hex River Region during the 2011/2012 season (SATI, 2012). The Hex River is the most productive region based on the total average production per farm size (Calculated from SATI, 2012).

The Orange River region is the second largest production region with the lowest number of producers per area under table grape production. This is an indication that the majority of the farms in the Orange River region are bigger than the rest of the table grape regions' farms. This doesn't necessarily mean that they are more productive than the rest of the regions. The Olifants River and the Northern Province are producing by far the smallest number of table grapes and both these regions have the least amount of producers respectively (SATI, 2012).

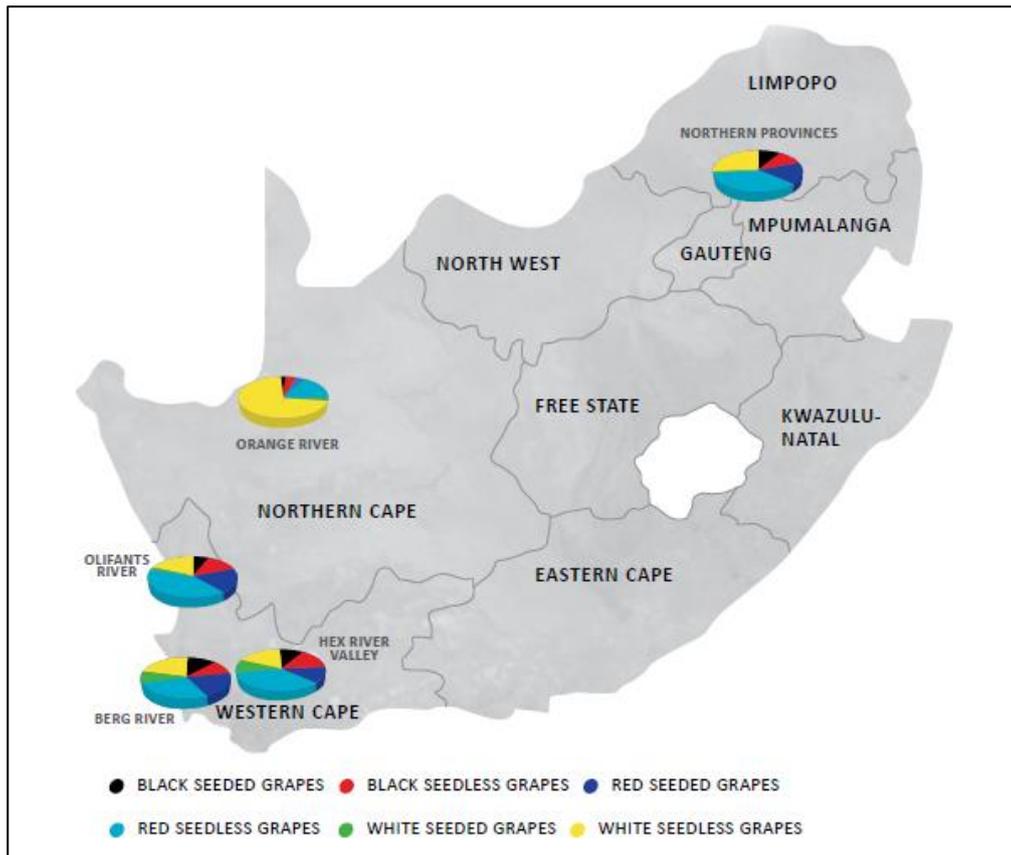


Figure 3.22: Production regions and varieties produced.
Source: SATI, 2014.

3.12.3 Varieties and Variety Groups

The diverse climate in South Africa is favourable to harvest different types of varieties throughout the year. The top 20 varieties exported that are produced from October to April are shown in figure 3.23. Crimson seedless continues to be the most popular variety to be exported while Prime, Thomson seedless, and Redglobe are also very popular varieties that were exported during the 2013/2014 harvest season (SATI, 2014). The demand for varieties changes annually and the change in demand can change the time to which the varieties are exported.

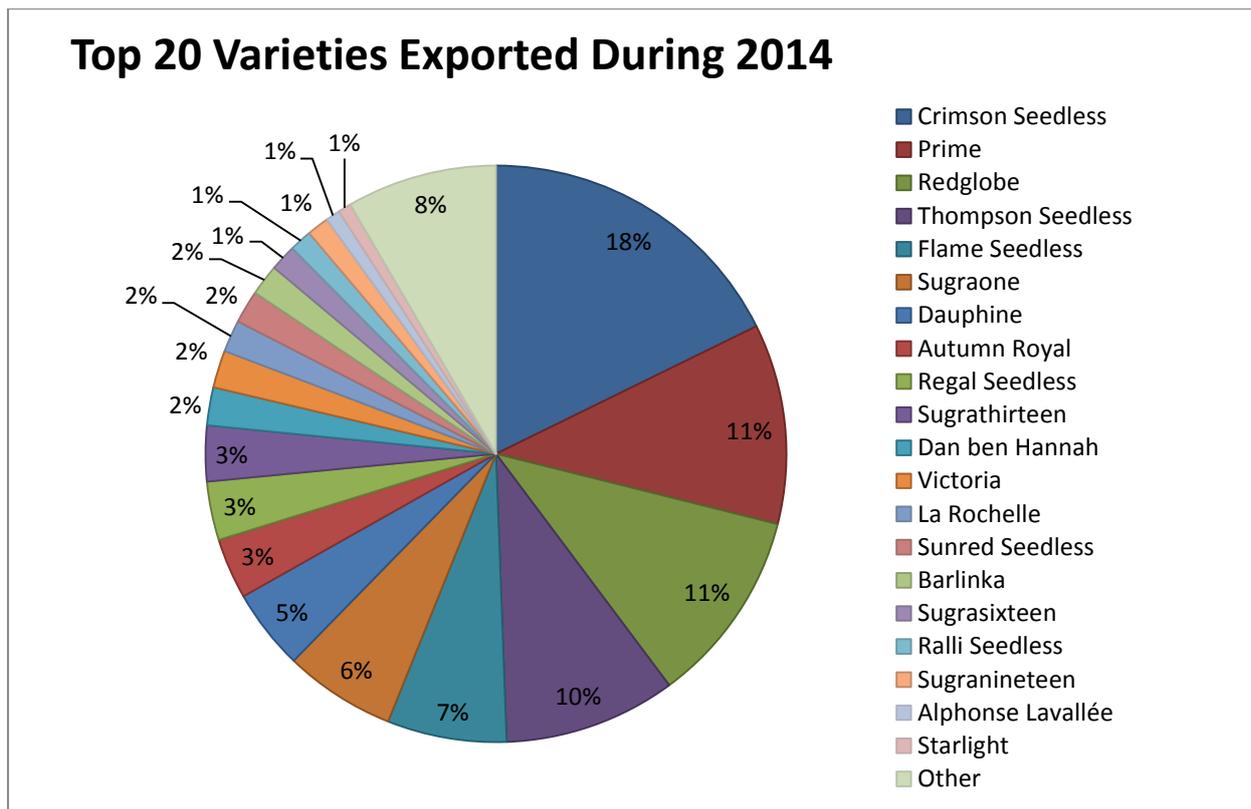


Figure 3.23: Top 20 Varieties Exported During 2014

Source: SATI, 2014.

There are six main variety groups that are produced and exported based on the preference of the customer as can be seen in figure 3.24. The six variety groups include white seedless, white seeded, red seedless, red seeded, black seedless and black seeded. White seedless varieties are by far the most demanded by customers with 37% of all exports. Red seedless varieties are the only other variety group exported that stands out from the rest with 26% of exports and continue to increase.

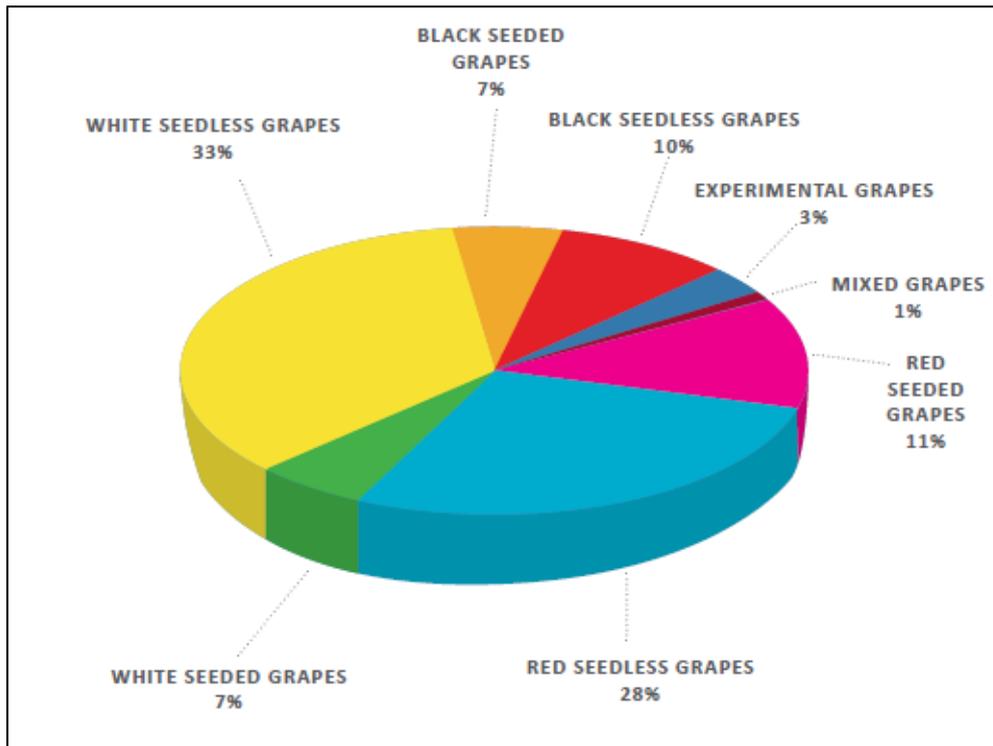


Figure 3.24: Table grape exports per variety group during 2014.
Source: SATI, 2014.

3.12.4 Market Structure

The majority of South Africa's table grapes are exported and only a small share of the production is sold locally. During the 2011/2012 season South African table grape exports accounted for 90% of the total production, which leaves only 10% of production to be sold locally (SATI, 2014). The market split increased from 86% of total production exported and 14% of total production sold locally during 2014, while this trend continues to increase annually. The high percentage exports leads to foreign exchange earnings flowing into South Africa and improving the economy. South Africa is also a key role player in the international exports sector and is the sixth largest table grape exporter in the world in terms of the value of exports (SATI, 2014).

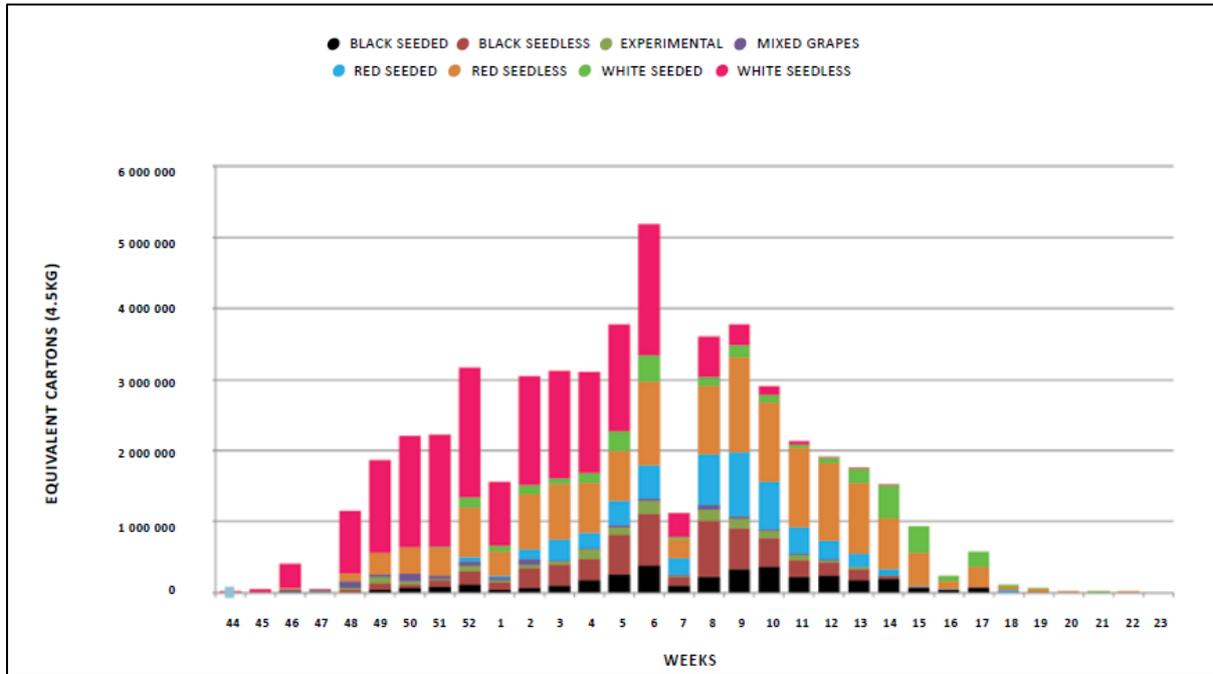


Figure 3.25: Export graph 2014 harvest season.

Source: SATI, 2014.

During the 2013/2014 season 50.311 million equivalent 4.5kg cartons were exported from South Africa (SATI, 2014). The United Kingdom and Netherlands are still the two biggest export markets and the majority of the table grapes produced in South Africa are exported to Europe (SATI, 2014). Exports amounts for a large proportion of total production.

Figure 3.26 illustrates clearly that Europe has the largest share of exports from South Africa with 56% while the United Kingdom imports 21% of South Africa’s table grape exports. The Far East, Middle East, Russia, Indian Ocean islands and Africa combined represents a small percentage of total exports that contributes 23% of total exports.

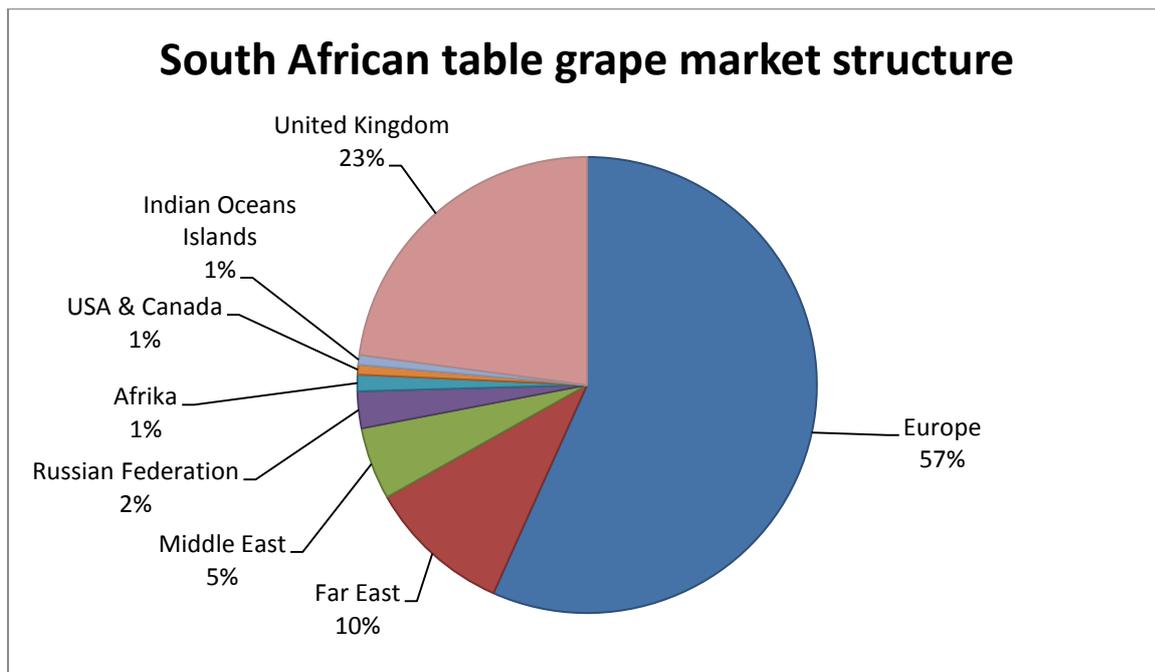


Figure 3.26: South African table grape market structure.
Source: SATI, 2014.

3.12.5 Logistics and Supply Chain Management

The table grape export industry is dependent on efficient supply chain management and especially cold chain management. Ocean cargo and air cargo are the modes of transport that can be used to export table grapes. The majority of table grapes are exported by means of sea vessels and should not at any stage experience a break in the cold chain that could jeopardise the quality of the grapes. For every 10°C increase above the recommended temperature the rate of respiration and ripening can increase twice (Department Agriculture, Forestry and Fisheries, 2012).

Effective cold chain management is important throughout the whole supply chain, from the farmers' cold stores to the refrigerated containers on the trucks transporting the grapes to the shipping terminals where it will be stored, to the actual shipping of the containers, and the importers and distributors that must transport the grapes to the retailers. Without logistical coordination and supply chain management the grapes will not maintain the required quality and the farmers' reputation can be jeopardised.

The major logistics processes and activities like transportation and packaging during table grape exports are capital intensive. This means that farmers must have adequate working capital available to enable efficient flow of grapes at all times.

3.13 Economic Value Added

The Economic Value Added (EVA®) model was developed for performance management for high level management to signal problems quickly and identify sources for improvement. This method has become an alternative approach for companies as a measure of financial performance at corporate level (Dunbar, 2013). During this section EVA® will be explained and the correlation with cash-to-cash cycle time highlighted.

The EVA® model was developed by the consulting firm, Stern Stewart & Co. due to the increased need for managers to be able to use a simple language that can be understood and that is based on information that is easily accessible. EVA®, as defined by Stern Stewart & Co., measures the economic profits earned by a firm during a given period. It is a popular performance measure since it takes into consideration not only the profits generated by the company's resources, but also the cost of those resources (Bahri *et al.*, 2011). The difference between EVA® and traditional accounting measures is that EVA® indicates how well a company performs in relation to the amount of capital employed. The calculation of the EVA® is presented below:

$$\text{Economic Value Added (EVA)} = \text{NOPAT} - (\text{Capital Invested} \times \text{Cost of Capital})$$

The EVA® model has two main components, the net operating profit after tax (NOPAT) and a capital charge. NOPAT reflects the difference between sales and cost of sales-, including operational expenses, after tax is deducted. The cost of capital equals the invested capital times capital cost rate. Invested capital can be further broken down into the sum of working capital and fixed assets. The cost of capital is the opportunity cost of making a specific investment, in other words investing the same money into a different investment with equal risk.

The cash-to-cash cycle time is one of the value drivers that influence EVA® directly and forms part of working capital management as seen in figure 3.27. The cash-to-cash cycle time represents an important part to understand the financial impact of process optimisation in the physical and financial flow.

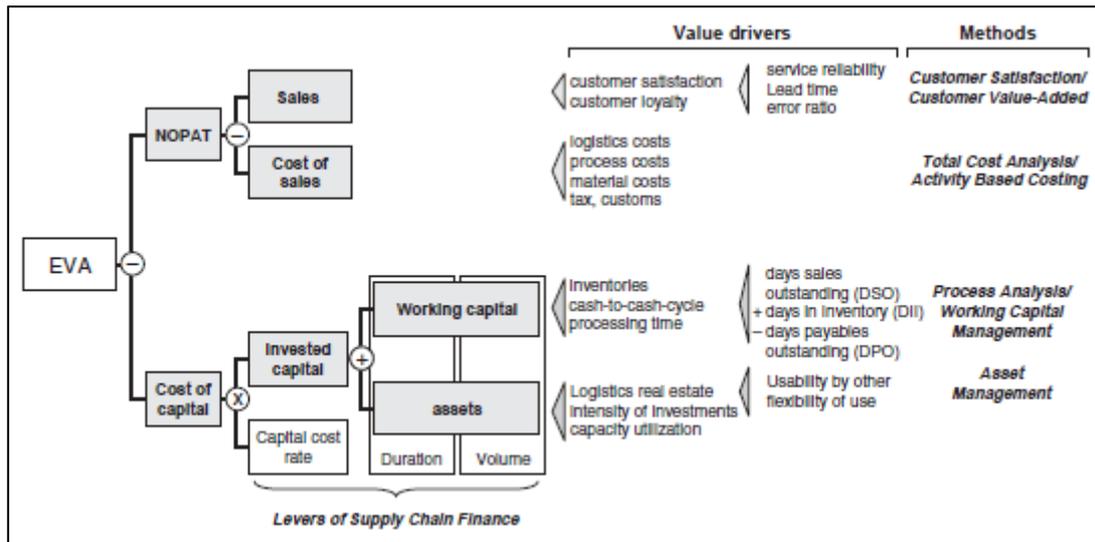


Figure 37: EVA value-driver hierarchy and levers of SCF.

Source: Gomm, 2010.

EVA[®] is important to top management since it indicates how much value company projects can create (during the research the implementation of SCF is the project) and it serves as a reflection of management performance. One of the benefits of using EVA[®] is that it summarises from where wealth is created and the calculation includes the balance sheet to keep assets and expenses in mind before making decisions.

EVA[®] is also important to a company since it determines the value of the company in terms of more than average value generated by the company for shareholders (Bolek *et al.*, 2012). EVA[®] contributes to growth in the wealth of the shareholders, because it ensures the consistency between the controlling of a company's operational performance and share price in the market. Denau Farming is not a listed public company for shareholders but they are currently in the decision-making process to make shares available to the public.

Bolek *et al.*, (2012) did research on EVA[®] and cash-to-cash cycle time, explaining the relationship between the cash-to-cash cycle time and EVA[®]. Bolek *et al.*, (2012) found that if the cash-to-cash cycle time is lowered EVA[®] will increase. EVA[®] is an effective way to measure a company's true economic profit, because it deducts the full opportunity cost of all invested capital, equity as well as debt.

SCF look to improve a company's working capital by improving cash flow. The cash-to-cash cycle time is used as a measurement tool to evaluate the financial performance and has a direct effect on EVA[®]. The EVA[®] model will thus give management a good indication whether to invest in SCF. During

the research only the effect that the particular SCF model will have on the cash-to-cash cycle time, and thus on the EVA[®] will be investigated.

3.14 Deduction of Literature Review

During the literature review various elements and perspectives of SCF are explained. The focus is placed on the table grape industry, particularly on Denau Farming. The goal of the literature review was to broaden the reader's knowledge on the topic to eliminate any uncertainties regarding definitions, terminology, and table grape supply chain processes.

The first part of the literature review was defining SCF and identify previous research that was conducted on SCF. The evolution and development of SCF is explained. For the purpose of the research the definition of SCF described by Bryant *et al.*, (2013) is used and is defined as:

“The use of financial instruments, practices and technology to optimise the management of the working capital and liquidity tied up in supply chain processes for collaborating business partners. SCF is largely event-driven. Each intervention (finance, risk mitigation or payment) in the financial supply chain is driven by an event in the physical supply chain. The development of advanced technologies to track and control events in the physical supply chain creates opportunities to automate the initiation of SCF interventions.”

The different types of SCF are explained to identify the most appropriate model based on the financial need developed by Denau Farming. The various triggers that lead to the need for SCF are identified. The working capital requirements of table grape producers are illustrated by means of the calculation of cash requirement of producing and exporting table grapes. The total working capital requirements of an average size table grape farm are calculated to illuminate the significance of the need for SCF. The various factors that generate financing needs throughout the table grape industry are identified. The conclusion was made that the biggest factor that leads to the need for financing is due to the high production costs that start at a very early stage compared to when income is received for exporting grapes.

The implementation process of SCF is described in section 3.7. This section explained the four propositions of Wuttke *et al.* (2013) during the implementation of SCF. These four propositions directly related to the concept model developed, in particular the M4SC[™] framework.

The correlation between Incoterms® 2010 and SCF is explained concerning the accountability and the payment terms. The type of Incoterms® 2010 will determine the time on which the buyer have to pay for the goods and when it will be registered on his balance sheet.

Denau Farming's supply chain was observed to identify the time frame of each process that leads to the long time frame and thus late payment. This has also lead to the understanding of the physical supply chain to identify if there are any inefficient nodes and activities to change during the case study. The stakeholders of SCF that relates to the supply chain processes of table grape supply chains are defined.

The significance of the South African table grape industry is explained in terms of its background, production regions, varieties produced, the market structure, and logistics and supply chain management of table grape supply chains. The large share of exports emphasises the importance of efficient physical and financial supply chains. The complexity of the export table grape supply chain is explained that leads to complex financial supply chains as well.

The final part of the chapter reflects the literature behind the Economic Value Added model that forms part of the case study. The focus is placed on research done by Bolek *et al.*, (2012) regarding the cash-to-cash cycle time and EVA®. The SCOR® cash-to-cash cycle time is used for the calculation and forms part of the concept model. The goal is to identify the change in working capital (cash-to-cash cycle time) and the expected effect it has on EVA® after implementing SCF.

Chapter 4: Concept Model

4.1 Introduction

All organisations strive to have a competitive advantage so that they can maximise their revenue by selling more goods and services. In doing so, they must strive to improve on a continuous basis and be as efficient as possible. It is therefore important to monitor the efficiency to prohibit stagnation and strive towards continuous improvement. It is difficult to determine whether an organisation is operating efficiently without actually measuring the performance with KPI's and making use of benchmarks.

By measuring the efficiency of an organisation the performance is evaluated against certain criteria. This enables the organisation to identify functional areas of weakness and makes it easier to identify the changes needed to improve the overall efficiency levels.

Supply chains are often composed of independent business units with different owners and managers that have their own goals and objectives. It has been proved that working with the right collaborative partners the whole supply chain can be optimised by synchronising their business processes (Goedhals-Gerber, 2010).

Goedhals-Gerber (2010) defined supply chain efficiency as “the economy based on resource utilisation based on specific criterion while products are moved from one place to another, in the course of which movement of the products may be changed through processing”. It is however important that the whole supply chain is efficient and therefore Wong and Wong (2007) defined overall supply chain efficiency as “efficiency that takes into account the multiple performance measures related to the supply chain members, as well as the integration and coordination of the performance of those members.”

In this chapter the SCOR[®] metrics and the adapted M4SC[™] model are described in detail and the concept model is created. The concept model illustrates how SCF is implemented into the supply chain and identifies process changes.

4.2 SCOR[®]

The Supply Chain Council (SCC) has developed the Supply Chain Operations Reference (SCOR[®]) model to help organisations measure efficiency and apply the best-in-class practices to overcome

the efficiency-gap. There are a lot of criteria to choose from when measuring the efficiency of a supply chain. During the research the SCOR® Asset Management metric will serve as the supply chain efficiency criteria.

During the research the SCOR® model will be used to measure the efficiency of the supply chain. Reliability, responsiveness, agility, cost, and asset management serves as the five core supply chain performance attributes as shown in table 4.1. Under each of these supply chain attributes there are different levels of metrics of which many are hierarchical.

Table 4.1: SCOR® Supply Chain Attributes.

Attribute	Measurement
Reliability	On time, Complete, Undamaged
Responsiveness	Time to complete order from customer request to final acceptance
Agility	Time it will it take to scale up, How expensive is it to scale down
Costs	Cost of operation, Cost of goods sold
Asset management	C2C cycle time, Return on fixed assets, Return on working capital

Source: Source: Supply Chain Council, 2014b.

4.2.1 Cost of Goods Sold

Cost of goods sold is a SCOR® metric that will be used as a catalyst to be able to calculate the cash-to-cash cycle time. The cost of goods sold is the cost associated with buying raw materials and producing finished goods (Supply Chain Council, 2014). Direct costs (labour, purchased materials) and indirect costs (overhead) are included in the cost of goods sold.



Figure 4.1: Cost of Goods Sold Hierarchical Structure

Source: Supply Chain Council, 2014b.

4.2.2 Cash-To-Cash Cycle Time

Emphasis will be placed on the cash-to-cash cycle time that forms part of the SCOR® Asset Management metric of the SCOR® reference model. The time it takes for a financial investment to return to a company after it has been spent for the acquirement of raw materials are known as the cash-to-cash cycle time (Supply Chain Council, 2014b). The cash-to-cash cycle time is a measurement tool that is estimated by converting both the inventory days of supply and the number of days outstanding for accounts payable and accounts receivable. After the cash-to-cash cycle has been calculated the result can be interpreted as follows: the longer the cash-to-cash cycle, the more working capital is required (Supply Chain Council, 2014b). The goal is to maximise the days payables outstanding, minimise the sales outstanding and the inventory days of supply.

The cash-to-cash cycle time measures how much working capital is required. The cash-to-cash cycle time is calculated by adding the days sales outstanding (DSO) to the inventory days of supply (IDS) and subtracting the days payable outstanding (DPO) as shown in table 4.2.

The inventory days' of supply is the amount of inventory expressed in days of sales. The days' sales outstanding is the length of time from when a sale is made until cash for it is received from customers. Days payable outstanding is the length of time from the purchasing materials, labour and/or conversion resources until cash payments must be made expressed in days (Supply Chain Council, 2014b).

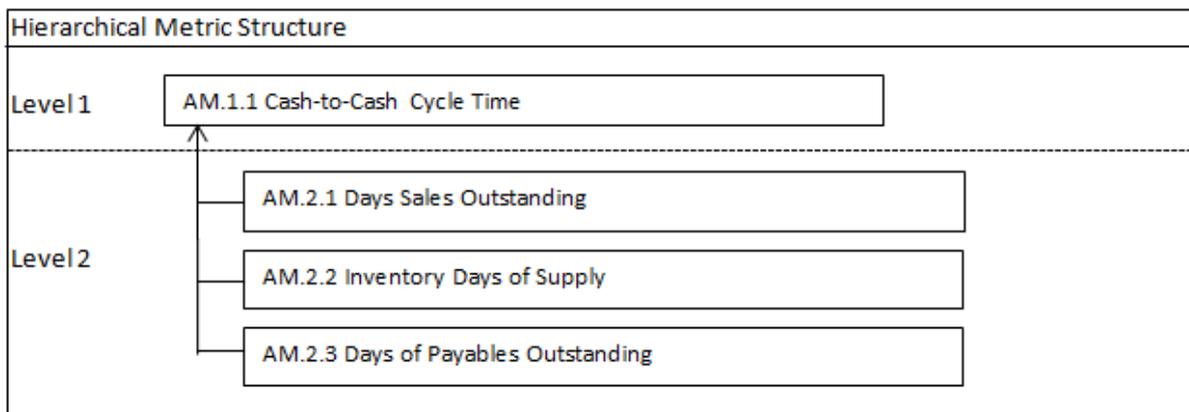
To calculate these three elements of the cash-to-cash cycle time, the five-point rolling average is used. This means that the rolling average value has to be calculated based on the average over the previous five years. The reason for using this approach is to smooth seasonal peaks over time to eliminate outliers in the data. The measurement can be taken quarterly or any other consistent time frame and during the research the cash-to-cash cycle time will be based on annual financial statements.

Table 4.2: Cash-To-Cash Cycle Time Calculation

Cash-To-Cash Cycle Time	Inventory Days of Supply + Days Sales Outstanding – Days Payable Outstanding
Further Breakdown of the Cash-To-Cash Cycle Time Calculation:	
Inventory Days of Supply	= Five-point rolling average of gross value of inventory at standard cost / [annual cost of goods sold / 365]
Days Sales Outstanding	Five-point rolling average of gross accounts receivable / [total gross annual sales / 365]
Days Payable Outstanding	Five-point rolling average of gross accounts payable / [total gross annual material purchases / 365]

Source: Supply Chain Council, 2014b.

Supply chain asset management is a performance attribute that is essential in making a supply chain efficient and is a value metric used to measure how efficiently a company manage its working capital assets (Supply Chain Council, 2014b). According to Presutti *et al.* (2007) asset levels that are used to create value in the organisation needs to be minimised, and factors such as capital utilisation, cash velocity, inventory turns, and cycle time reduction will impact how effectively the organisation is managing its assets.

**Figure 4.2: Cash-To-Cash Cycle Time Hierarchical Structure**

Source: Supply Chain Council, 2014b.

One of the reasons organisations are implementing SCF programs is because one of the goals of these programs is to release tied up cash in supply chains and thus reducing the amount of working capital required. The cash-to-cash cycle time is thus an effective choice to measure how SCF can improve efficiency in this respect. The cash-to-cash cycle time will be calculated for Denau Farming's as-is processes (no SCF implemented) and identify how the cash-to-cash cycle time will be affected after the to-be processes (SCF) are simulated into Denau Farming.

The proposed SCF models will not be implemented into Denau Farming, only simulated, as this will influence the whole business structure to a large extent. The two SCF models will be simulated to identify how the business processes will change and how the models will allow Denau Farming to generate cash flow.

Finally the research Bolek *et al.*, (2012) did on EVA[®] and cash-to-cash cycle time, explaining the relationship between the cash-to-cash cycle time and EVA[®] will be applied. The goal is to make conclusions of Denau Farming's economic profit based on how the SCF models will influence the cash-to-cash cycle time.

4.3 M4SC[™]

The M4SC[™] (Management for Supply Chains) is another framework developed by the Supply Chain Council to demonstrate how to implement the SCOR[®] tools, techniques, and templates throughout an organisation and not just at a project level (Supply Chain Council, 2014a).

The four process categories (also called layers) in M4SC[™] are Strategy, Network, Process and Resource. The processes in M4SC[™] are focused on managing the operations defined in the other Supply Chain Council frameworks. In other words they determine how well supply chain management processes are performing. The M4SC[™] framework is an addition to the existing SCC frameworks and are not covered in the SCOR[®] framework but do trigger or have inputs/outputs with M4SC[™] (Supply Chain Council, 2014a).

There is currently not an existing framework to manage the financial supply chains. The M4SC[™] framework of the Supply Chain Council does not include finance in its scope but the framework is adapted during the research to be financially orientated.

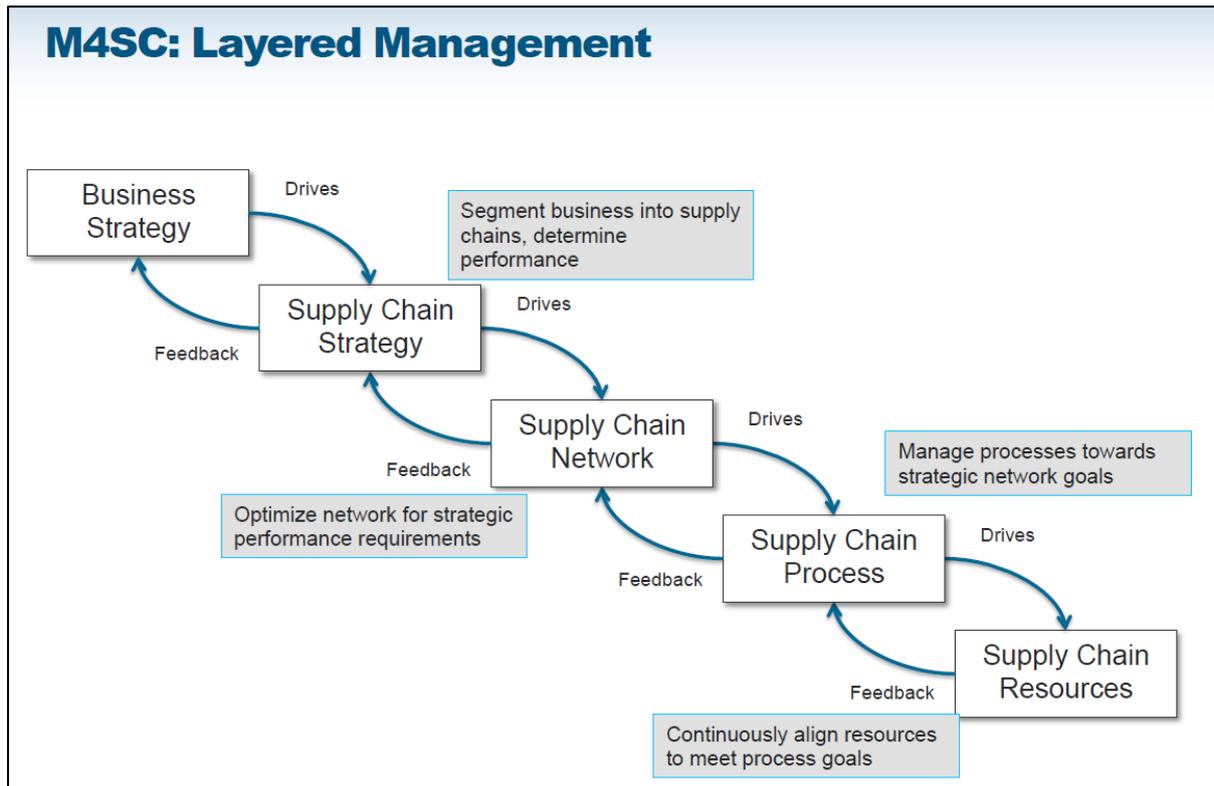


Figure 4.3: M4SC™ Layers

Source: Supply Chain Council, 2014a.

The Supply Chain Strategy layer focuses on the alignment of supply chains with customer-facing and internal-facing performance requirements of a given set of supply chains supporting a business model, or business plan (Supply Chain Council, 2014a). This layer is part of an overall large-scale planning process annually undertaken with a horizon of more than one year. The focus is on concrete definition on a set of supply chains, their strategy, and determination of gaps in the existing definition against future requirements.

Optimal configuration of major material resources within the supply chain(s), and the determination of that configured network's capability to support strategic performance requirements is the focus of the Supply Chain Network layer (Supply Chain Council, 2014). This layer is part of a detailed planning process that is undertaken annually with a multi-year horizon of design possibility. It differs from the strategy layer in the sense that it assumes prior definitions of supply chains and requirements. The network layer only looks at assessment, and possible redesign of physical material flows.

The Supply Chain Process layer focusses on the optimal deployment of supply chain processes within various elements of a supply chain network i.e. plants, warehouses, depots, channel partners, suppliers, etc. (Supply Chain Council, 2014a). The focus is on achieving local performance

requirements that are determined by the network configuration. This is typically managed at the asset level by the plant manager and the day-to-day performance requirements are determined by network requirements, and adjusted on a frequent basis to meet goals.

The optimal deployment of key resources to support the process specific performance is the focus point of the Supply Chain Resource layer (Supply Chain Council, 2014a). This includes deploying key resources like staffing, materials, production equipment, and IT automation. It is often reviewed and managed by the line-manager or process manager level.

The management layers have a hierarchical structure of sub-processes to describe the activities associated with the management of supply chains. Management of supply chains includes the governance and corrective activities to ensure a supply chain operates optimally in support of internal and external needs and expectations (Supply Chain Council, 2014a).

During this research the Supply Chain Council's M4SC™ framework is adapted to place the focus on SCF as a solution to improving cash availability. In the next section the management processes that are adapted and used in the research will be described in detail.

4.3.1 mAS Align Strategy

Align Strategy is the collection of processes required to align the supply chain strategy to the business strategy incorporated in the business plan (Supply Chain Council, 2014a). It is important that the organisation and the supply chain strategy are aligned before SCF can be implemented. Without aligning the business strategy with the supply chain strategy, conflicts of interest can occur between supply chain partners. Figure 4.4 shows the processes that were chosen and adapted for the Align Strategy layer.

Hierarchy		
mAS.01	Business Plan Analysis	←
mAS.02	Supply Chain Discovery	
mAS.03	Supply Chain Segmentation	
mAS.04	Supply Chain Prioritization	
mAS.05	Competitive Landscape Analysis	←
mAS.06	Supply Chain Organizational Analysis	
mAS.07	Supply Chain Strategy Analysis	←
mAS.08	Supply Chain Network Definition	←
mAS.09	Scorecard Definition	←
mAS.10	Supply Chain Data Collection	←
mAS.11	Supply Chain Benchmarking	←
mAS.12	Metrics Organizational Analysis	
mAS.13	Supply Chain Gap Analysis	←

Figure 4.4: M4SC™ Align Strategy Processes.

Source: Supply Chain Council, 2014a.

4.3.1.1 mAS.01 Business Plan Analysis

The Business Plan Analysis process requires that business plan information is gathered and interpreted by using related activities (Supply Chain Council, 2014a). These activities include-, the vision, mission, growth plans, and management objectives. The business plan provides a communication vehicle that structures the thinking about vision, mission, and charter with the objective of specific financial goals.

- The vision is what the organisation would like to achieve in the mid- to long-term future.
- The mission is the purpose of the organisation or the reason for existing.
- Growth plans in terms of size of the organisation.
- Management objectives define the objectives of the organisation so that management and employees agree to the objectives and understand what they need to do in the organisation to achieve them.

4.3.1.2 mAS.05 Competitive Landscape Analysis

The Competitive Landscape Analysis is the gathering of information and the analysis of the internal and external environment in which the supply chain operates (Supply Chain Council, 2014a). There are various tools available to identify the internal and external environment but the SWOT analysis

was the tool used to gather this information in the study. The focus of the SWOT analysis is placed on the strengths, weaknesses, opportunities, and threats to be able to identify the environment in which SCF will be implemented.

4.3.1.3 mAS.07 Supply Chain Strategy Analysis

The Supply Chain Strategy Analysis process represents all the activities associated with determining the relative and/or ranked importance of the SCOR[®] performance attributes (Supply Chain Council, 2014a). Strategic priorities of a supply chain are defined by using a strategic analysis matrix. Performance goals include:

- Superior
- Advantage
- Parity

The performance attributes are reliability (perfect order fulfilment), responsiveness (order fulfilment cycle time), agility (ability to deliver more products as demanded) cost (cost of goods sold), and asset management (C2C cycle time and return on working capital).

To be the best in class in a specific performance attribute is described as to be superior to competitors. To have a competitive advantage is to have performance attributes that are more efficient than competitors by comparing it with KPI's (Supply Chain Council, 2014a). It is only possible that one performance attribute has a performance goal of being superior. The result is that the rest of the performance goals perform equal to competitors. The performance attribute is thus called parity i.e. to have equal performance goals compared to industry players.

4.3.1.4 mAS.08 Supply Chain Network Definition

Defining the Supply Chain Network entails all the activities of gathering and documenting the current formal flow of materials and high-level process capabilities (Supply Chain Council, 2014a). This involves all the nodes and processes in the supply chain that forms part of the plan, source, make, delivery and return of products. For each entity or node the process capabilities is listed. The tools that are used to complete this process are geographic maps and/or logical material flow maps.

4.3.1.5 mAS.09 SCORcard Definition

All the activities related with the selection of key metrics for each performance attribute is known as the SCORcard definition. A SCORcard is a tool to define the metrics of most interest to the organisation and to arrange them by area of impact, strategic linkage, and to provide a container for later benchmarking/comparing. Only SCOR[®] Asset Management will form part of the high-level

metrics to keep the focus on SCF. During this process it is important to define exactly what metrics will be used to erase the occurrence of mistakes and comparing “apples with apples”. The SCOR® Cost metric will only be used to calculate the cash-to-cash cycle by means of the cost of goods sold level two metric.

4.3.1.6 mAS.10 Supply Chain Data Collection

The Supply Chain Data Collection process includes all the activities related to the gathering of performance data for the SCORcard (Supply Chain Council, 2014a). These processes can be standardised and automated by using reporting tools. This process tells the researcher how to collect the data and information and what data and information to collect. The data will consist mostly of data obtained from financial statements of the table grape farmers.

There are two data requirements to complete the research: Cost of goods sold data requirements which are the direct material costs, direct labour costs, and indirect costs related to making the product. The other data requirement is the cash-to-cash cycle time data requirements calculated by the inventory days' of supply, days' sales outstanding, and days' payable outstanding variables.

4.3.1.7 mAS.13 Supply Chain Gap Analysis

This analysis considers activities associated with the identification and prioritisation of gaps in high-level performance metrics (Supply Chain Council, 2014). This includes identification and prioritisation of corrective actions that should be taken and communication of performance goals.

The business decision is to identify the gaps in performance and what appropriate corrective actions should be implemented to improve the gap. Examples of corrective actions include: change in supply chain performance targets, change in individual performance targets, and reassign ownership.

4.3.2 mAN Align Network

Not much focus will be placed on the Align Network processes because an assumption are made that the network structure is efficient in the current as-is state. During the observations the table grape supply chains are identified as being efficient without changing the as-is network configuration, but only adjusting existing nodes of the network configuration. Figure 4.5 indicates the Align Network layer process that was selected to adapt.

Hierarchy	
mAN.01	Supply Chain Strategy Analysis
mAN.02	Supply Chain Network Definition
mAN.03	Network Process Flow Definition
mAN.04	Network Organizational Analysis
mAN.05	Network Standardization Analysis
mAN.06	Network Constraints Analysis
mAN.07	Network Performance Analysis
mAN.08	Network Metric Prioritization
mAN.09	Network Solution Definition
mAN.10	Supply Chain Network Definition
mAN.11	Supply Chain Network Validation
mAN.12	Network Change Prioritization

Figure 4.5: M4SC™ Align Network.
Source: Supply Chain Council, 2014a.

4.3.2.1 mAN.04 Network Organisational Analysis

Network organisational analysis entails all the activities associated with reviewing the roles and responsibilities at the network node level (Supply Chain Council, 2014). The objective of this process is to document roles and responsibilities for nodes and high level processes across the supply chain network for the conflicts and deficits, and to clarify communication channels where various inputs/outputs are required. This process also identifies the organisational structure in which business is done.

4.3.3 mAP Align Processes

The collection of processes required to maintain supply chain performance within the supply chain network (Supply Chain Council, 2014a). The supply chain management processes are the financial practices used to meet responsibilities (financial outflow) and receive income (financial inflow). SCF is used as a supply chain management process to overcome the identified gap and develop the proposed to-be processes. Figure 4.6 illustrates the processes that were chosen to adapt and form part of the concept model.

Hierarchy	
mAP.01	Supply Chain Network Definition
mAP.02	Process Flow Definition
mAP.03	Process Data Collection
mAP.04	Process Organizational Analysis
mAP.05	Process Standardization Analysis
mAP.06	Process Performance Analysis
mAP.07	Process Solution Definition
mAP.08	To-Be Process Definition
mAP.09	To-Be Process Verification
mAP.10	Business Rules Impact Assessment
mAP.11	Organizational Impact Assessment
mAP.12	Process Change Prioritization

Figure 4.6: M4SC™ Align Processes.
Source: Supply Chain Council, 2014.

4.3.3.1 mAP.02 Supply Chain Process Definition

The activities associated with the documenting of the current as-is processes is defined as the Supply Chain Process Definition (Supply Chain Council, 2014a). This includes documenting the current financing that the organisations obtain to meet obligations, the financial flow, and the involved channels it passes through during exports. It is beneficial to create a financial flow map to make the current financial flow clear to the reader.

4.3.3.2 mAP.06 Process Performance Analysis

The Process Performance Analysis process is the activities associated with data collection and verification of information to identify root causes of gaps in the as-is process performance. This includes physical and financial problems that are identified from observations and interviews.

4.3.3.3 mAP.07 Process Solution Definition

The Process Solution Definition process entails the activities associated with the discovery and selection of new ways or processes (SCF) with the purpose to reduce or eliminate the gap identified. SCF will be the proposed new process that will be simulated in the as-is supply chain. The type of SCF model that will be simulated into the supply chain is chosen based on the best solution to improve the gap in the supply chain. Examples of -methods to discover new ways are brain storming, consulting, research input, and practices benchmarking (Supply Chain Council, 2014a). Various

supply chain professionals can be consulted to choose the best solution and the researcher's knowledge from the literature review contributed to choosing the most effective solution.

4.3.3.4 mAP.08 To-Be Process Definition

The activities associated with developing or choosing and documenting the future state process steps and the SCF solution – the to-be process. This includes documenting activities, inputs, outputs, duration, practices, skills required.

4.3.4 mAR Align Resources

The collection of processes required to maintain supply chain resources in support of supply chain processes. It also provide for the identification of new sources of finance. Figure 4.7 shows the two processes that form part of the concept model and is adapted to emphasize resource requirements implementing SCF.

Hierarchy	
mAR.01	Network/Process Change Portfolio Analysis ←
mAR.02	Skills and Resource Assessment
mAR.03	Process Documentation Assessment
mAR.05	Organization Assessment
mAR.04	Technology Assessment ←
mAR.06	Resource Program Planning
mAR.07	Resource Change Prioritization

Figure 4.7: M4SC™ Align Resources.
Source: Supply Chain Council, 2014a.

4.3.4.1 mAR.01 Process Change Portfolio Analysis

The activities associated with the gathering and analysing information on changes in supply chain strategy and process changes that may affect supply chain resources (Supply Chain Council, 2014a). The purpose of Process Change Portfolio Analysis is to determine if conditions have changed that require changes in resources. The solution to the gap in the supply chain will in many cases change the strategy of the organisation and even the structure of the organisation.

4.3.4.2 mAR.04 Technology Assessment

The activities associated with identification of gaps in technology supporting the supply chain is defined as the Technology Assessment Process (Supply Chain Council, 2014a). The purpose of the

Technology Assessment process is to determine the actions needed to address gaps in technology. This includes gaps in facilities, equipment and ICT (Information, Communications Technology).

4.4 Identified SCF Models

In this section the two proposed SCF models that will be simulated into Denau Farming's business structure will be explained. The reason behind the choice of each model is explained to give the reader a better understanding of the problem of late payment received by buyers experienced by Denau Farming during international trade.

The use of SCF models increased over the last decade with the focus of moving away from letters of credit in which suppliers wait long periods to get paid for goods sold internationally (BAFT-IFSA, 2010). A Letter of Credit is a guarantee issued by the buyer's bank to the seller which guarantees payment on the presentation of the correct trade documents (ING Group, 2013c). Making use of Letters of Credit can take up to eight weeks to receive payment from buyers because of documentation inaccuracy, prolonging an already lengthy process (ING Group, 2013a). Therefore, the finance department of Denau Farming should identify the importance of increasing the efficiency of international trade processes ensuring earlier payment from buyers to avoid disruption of the physical supply chain.

The first SCF model that is chosen to simulate into Denau Farming's business structure is the Bank Payment Obligation with Approved Payables Finance. This SCF model is based on open account trade eliminating Letters of Credit. The International Chamber of Commerce created the Bank Payment Obligation as a method of financing during international trade with the focus on security of payment to the seller and to provide financing at various stages of the transaction lifecycle (International Chamber of Commerce, 2013). There are different types of financing that can be used during the transaction lifecycle based on the financial needs of the seller. Approved Payables Finance was chosen to simulate into Denau Farming's business structure due to the delayed need for financing achieved during international trade. According to Louw (2014) when selling grapes to smaller international buyers the transaction results into default. The Bank Payment Obligation acts as an instrument to secure payment from buyers avoiding default. Another reason that Approved Payables Finance is chosen as an SCF model is that it automates documents through the Transaction Matching Application eliminating discrepancies and thus delays. A factor that influence the choice of the Bank Payment Obligation with Approved Payables Finance is chosen as a possible solution is because the International Chamber of Commerce has developed uniform rules for Bank Payment Obligations during international trade. The prospect is to develop and transform Bank Payment Obligations as

set standards during international trade with binding legal and financial procedures to be regulated (International Chamber of Commerce, 2013).

The second SCF model to be simulated into Denau Farming's business structure is Aztec Money's SCF solution. This model is chosen as an innovative solution to obtain finance for farmers that develops a need for cash flow later in the supply chain life cycle. Aztec Money's solution makes use of the internet to sell invoices on a trade market called Aztec Exchange. This is an attractive model to Denau Farming because of the simplicity and the quick turnaround time to turn stock into cash flow. During an interview with Devine (2014), the business development vice president of Aztec Money, he made it clear that selling invoices on Aztec Exchange is a simple and safe means for suppliers to obtain finance with minimum risk involved. A win-win-win situation is created for the supplier, Aztec money, and the buyer of the goods. The supplier is able to get instant finance for goods exported, Aztec Money gets a percentage of the invoice value and the buyer of the goods can pay the supplier on the original due date.

4.5 Deduction

Throughout Chapter 5 the two models will be explained and simulated into Denau Farming's business model in detail. The two models will be defined as the to-be processes to improve cash flow for Denau Farming during international trade. The changes that the two SCF models will have on the business environment will be identified as well as the resource requirements. The three techniques are incorporated to form the concept model and flows into the case study which is illustrated in figure 4.8. The SCOR® Model and the SCF models flow into the adapted M4SC™ framework which forms the concept model. The concept model then flows into the case study.

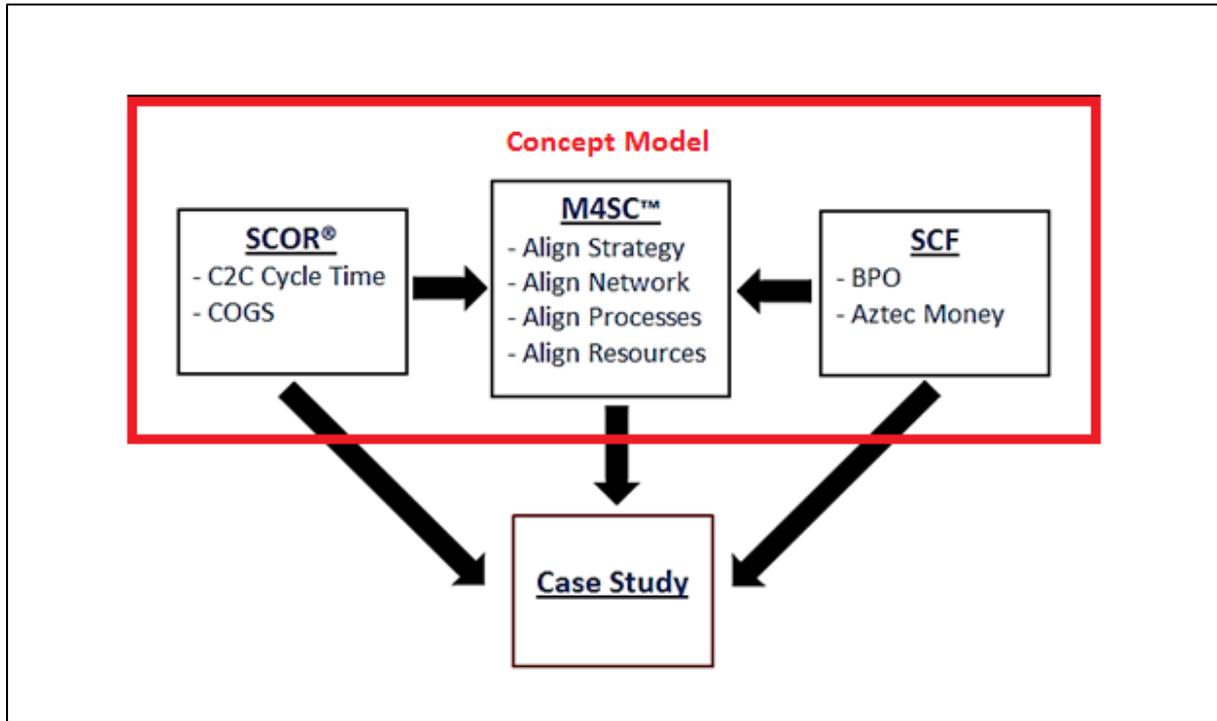


Figure 4.8: Flow of the Concept Model

Chapter 5: Case Study

5.1 Introduction

A case study is developed to illustrate how one of Denau Farming's table grape supply chains operates with the focus on timeliness of financial flows. The case study consists of two parts in which two SCF models' implementation is simulated and its impact on Denau Farming's supply chain is identified. The first SCF model that is simulated into Denau Farming's business model is the Bank Payment Obligation combined with Reverse Factoring, also known as Approved Payables Finance. The second model that is simulated into the supply chain is reverse factoring orchestrated by a non-bank financial institution.

During the case study Denau Farming's supply chain from production to the point that goods are delivered to the buyer is examined and illustrated. The appropriate supply chain will be mapped, identifying the high level nodes and processes with the corresponding financing of each process. The duration of the ownership is given with the exact time when ownership and accountability is transferred to the customer. The author conveys his rationale for the study and reasons for choosing to conduct a case study as follows:

A need exists to study how fresh fruit exporters' supply chains operate with the focus on SCF to be able to understand the complexities of the financial flow during fruit exports and the need for cash availability that is generated. Denau Farming is explored as a case study to be able to make conclusions regarding table grape exports and implementation of SCF. It is important to understand whether supply chains are operating efficiently with or without implementing SCF in terms of business strategy, business processes and customer satisfaction. A case study has the ability to provide more insight into a specific circumstance and to monitor the results. Case studies can also provide the foundation for decision making by simulating the implementation process. An in-depth qualitative and quantitative case study exploring the context of SCF can illuminate such conceptual understandings. Two SCF models are investigated individually as respective solutions to generate cash flow and optimising working capital.

With the research purposes of wanting to describe and interpret Denau Farming's table grape supply chain and processes, and to measure the efficiency of the financial supply chain, the author has identified three significant themes focussing on the different supply chains:

- Background

- Supply Chain Operation
- Concept Model

The first part of the case study is titled, “Background”. In this theme the background on the Denau Farming is described to give the reader an understanding of the size of their operations and what business structure they are following.

The second part of the case study is titled, “Supply Chain Operation”. In this section a detailed description of how Denau Farming’s table grape supply chain currently operates is provided. This will mainly include the physical flow of grapes from production to when the goods are delivered to the buyer. A supply chain map helps the reader to get a better understanding of the structure of the supply chain. This theme also investigates who is responsible for the financing of the particular process in the supply chain. The corresponding financial flow is used for illustrative purposes that connect the physical flow of grapes and the financial flow.

The final theme is titled-, “Concept Model”. In this theme Denau Farming’s business strategy is described, the as-is processes are described in detail and illustrated, gaps in the supply chain was identified and a to-be solution is provided in the form of SCF, and the changes in resource needs are identified. The SCOR® framework is used to measure financial performance in terms of metrics identified in Section 4.2. This whole theme is based on the M4SC™ framework that is adapted to place focus on SCF as a solution to cash-flow inefficiencies.

In order to answer the main research question and complete the three themes using case study methodology the following case study data was used:

- Primary data that consist of interviews with a wide range of table grape producers, logistics managers, and financial service providers;
- Observations of the table grape export supply chains; and
- Acquisition of quantitative and qualitative data needed to measure efficiency using SCOR® and M4SC™.

5.2 Background on Denau Farming

Located in the Hex River Valley of De Doorns, Denau Farming is a family owned business that dates back to the year 1841. It started out as a non-commercial farm and has evolved into a sixth-generation family owned farming business. The farm originally exclusively produced table grapes but management made the decision to plant citrus fruit in 1988.

Denau Farming is the operating company that manages the agricultural needs of the Naudé Family Trust. The trust owns a surface area of about 2,000 hectares of which 158 hectares consist of table grapes and 60 hectares of citrus fruit

The Denau Farming's workforce consists of 200 permanent labourers and during the harvest season 200 more labourers are contracted. Denau Farming has packing facilities and cold storage facilities on the farm and they own the most of their equipment. The only activity that needs to be outsourced is the transportation from the farm to the port and from the port of origin to the port of destination.

Denau Farming, together with four other shareholders, established EXSA in 1997 which accounted for all their fruit exports until 2005. In 2006 Denau Farming decided to leave EXSA and became a shareholder of Hoekstra Fruit Exporters together with two other table grape producing shareholders. Denau Farming holds 40% of the shares in Hoekstra Fruit Exporters while Hoekstra Fruit Farms, owns 60% of the share. UK imports represent 20% of Hoekstra Fruit Exporters' grapes and Europe the majority of 80% of the imports. Denau Farming exports 100% of their harvest to international markets like the United Nations and Europe.

Hoekstra Fruit Exporters is responsible for Denau Farming's marketing and logistics activities during the export of their products at cost price. These activities include forwarding, terminal handling charge, and cool storage at the port, merchant haulage, costs for survey report, and laboratory costs.

Denau Farming has moved from the traditional role of only producing table grapes to a full functional business with various divisions in place and adding value to the whole supply chain. They have their own team that consist of a financial manager, marketing manager, human resource managers, and operational managers.

5.3 Denau Farming Supply Chain Operation

Before the supply chain process is defined it is important to define the market that was investigated to better understand accountability in terms of financial obligations. Hars & Hagenbauer imports table grapes from countries all around the world, like Chile, Spain, and Italy, and is one of the importers responsible to pay for grapes exported by Denau Farming. Retailers then purchase the grapes from Hars & Hagenbauer, in this case Tesco is the retailer that buys the goods from Hars & Hagenbauer. Figure 5.1 identifies the upstream financial flow of Denau Farming during table grape exports.

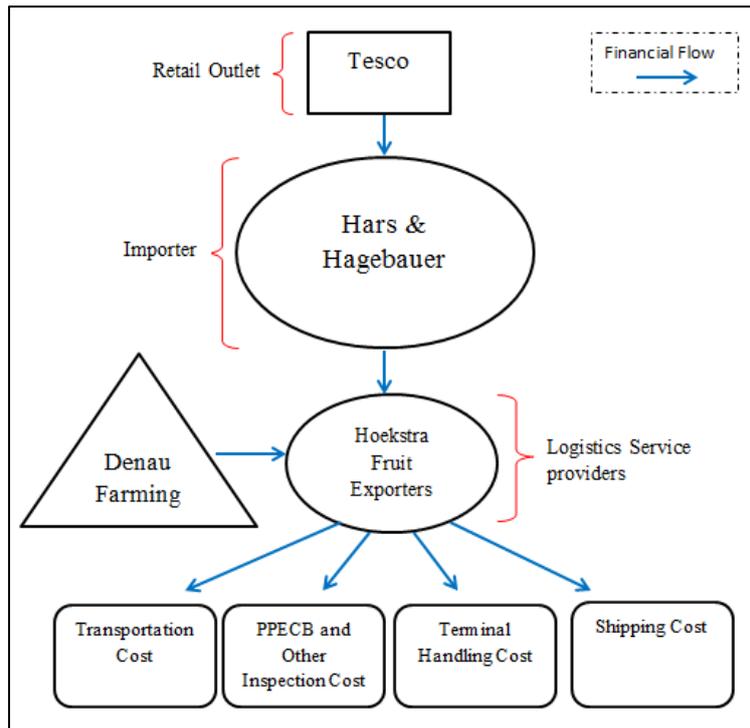


Figure 5.1: Identified financial flow of Denau Farming.

Denau Farming is currently financing their own exports with internal finances, but that their cash flow is not efficient. The reason Denau Farming has the ability to finance their own exports can be based on a number of factors.

The first reason why Denau Farming has adequate cash available to pay for their operations is that they have more than one crop. They are producing table grapes and citrus fruit which are harvested and exported during different time frames. After the table grape harvest season (November-April) is finished the citrus fruit harvest season starts (May-October). This means that the two crops are harvested during different time frames but was spread over the whole year which is also the main reason for cash availability.

Denau Farming saves enough capital from the citrus fruit harvest season to carry over and cover some of the table grape costs and vice versa. This surplus capital will usually be allocated to cover part of the shipping costs and production costs.

There are two types of tariffs that the importers can apply to goods exported by Denau Farming that has an influence on accountability and responsibility to meet obligations. Denau Farming and the shipping company agree upon a tariff in November and the two types of charges include:

- Consignment (Account of sales)
- Fixed price transactions (Fixed tariff facture)

Denau Farming more often makes use of fixed tariffs to establish shipping prices for the shipment of their grapes. When Consignment charges are applied CIF terms are used and when a fixed tariff is applied FOB terms are used.

The day at which the ship is departing is another important aspect in terms of the payment process. The shipping charges are required to be paid seven days after the bill of lading is issued to the importer and the recipient of the cargo, which requires internal cash availability or Denau Farming will have to make use of external finances.

The bill of lading is the single most important document that also initiates the start of the financial flow for Denau Farming. The bill of lading is the document that is sent to the importer to verify what containers are on the ship and what grapes are in the containers and where the cargo is going to. The bill of lading can also be used to determine ownership of the cargo. The bill of lading is usually sent via courier to the buyer as soon as the supplier has received payment from the buyer. The supplier does this to ensure that payment is received, because if the buyer does not pay for the goods the supplier will not send the original documents and the goods will not be able to be cleared. The final result is that demurrage charges are incurred and the shelf-life of the grapes is reduced.

Denau Farming receives early payment in their current operations in the form of an advance which frees up cash in the supply chain. On the day that the cargo is loaded onto the ship, an advance is paid to Denau five days after the bill of lading is received by the importer and the recipient of the cargo. This advance received from buyers usually only covers part of the shipping cost. The total advance is estimated as a percentage of the price per carton. A profit is only realised after the final payment is received and the production costs are deducted.

During the supply chain that was observed the cargo takes 23 days on average to reach the port of destination if there are no delays or congestion (Louw, 2014). Denau Farming receives the total amount due for goods shipped after approximately 11 weeks, however the time in which table grape suppliers get paid can be delayed by a week if there is congestion in the port (Greyling, 2014).

A need for SCF for most farmers will arise because of the total time it takes to receive final payment from buyers from the time that the farmer's preparation costs start. Denau Farming's costs already start in July and their first production income (excluding their advance payment) is received after 8 months (Louw, 2014). The costs that occur during this period are very high and need adequate working capital to be able to meet these obligations.

Table 5.1: Time elapsed from pack store to final payment.

Time	Activity
Week 10	Pack store
Week 11	Ship grapes
Week 13	Ship arrival (Quality Check)
Week 14	Depot in UK
Week 15	Hars & Hagebauer invoices Tesco
Week 19	Tesco pays Hars & Hagebauer
Week 20	Hoekstra Fruit Exporters receive Account of sale
Week 21	Hoekstra Fruit Exporters receives final payment

Source: Louw, 2014.

Denau Farming is accountable for the grapes to the point where the buyer consumes it. If there are any problems with the grapes in terms of quality, the importer or the receiver of the grapes will charge a levy to the farmer that is deducted from the selling price. The Incoterms® that are used the majority of the time are FOB, and CIF. As can be seen in table 5.1, if Denau Farming ships FOB terms it means that Denau Farming is accountable for all charges before the goods are loaded on board the vessel. These charges include warehouse services, export packing, origin loading, inland freight, port recreational charges, and forwarder charges. In other words the risk transfers from Denau Farming to Hars & Hagenbauer at the named port on board the ship. The difference between FOB terms and CIF terms is that the freight charges are paid by Denau Farming and not by Hars & Hagenbauer. This means that risk transfers from Denau Farming to Hars & Hagenbauer at the port of destination.

5.4 Concept Model Applied

In the next section the concept model developed in Chapter 4 is applied to Denau Farming's business structure. Data and information is gathered to complete all four process layers that forms part of the M4SC framework. The SCOR® Model and the two proposed SCF models are incorporated into the M4SC™ framework to form the concept model. The M4SC™ framework is adapted to have a more financial emphasis to accommodate SCF. During this section only the data and information is provided for each management layer, during Chapter 6 and Chapter 7 each process will be explained in detail.

5.4.1 mAS Align Strategy

The Align Strategy layer has seven processes that are described below. This management layer identifies the strategy of Denau Farming in terms of their financial goal. This management layer also

identifies ways to reach the goals as well as the gap in the supply chain that disrupts the supply chain to reach the financial goals.

5.4.1.1 mAS.01 Business Plan Analysis

Vision:

The vision of Denau Farming is to be a sustainable, successful family organisation primarily in the agricultural sector with a unique trademark that is well established in international markets with the recognition of products with outstanding quality.

Mission:

Denau Farming's mission is to deliver top quality table grapes and citrus fruit to the international consumer. Their production practices focus on combining high international standards inside the sensitive production environment. They have a high regard towards their workforce and share in the success of the organisation. They promote a participatory culture, based on Christian values.

Growth Plans:

A goal of Denau Farming is to become one of the key industry leaders and to have a competitive advantage over other industry players. In order to reach this goal they have to expand their organisation in terms of farm size. Denau Farming's growth plans in terms of farm size are to increase the area under table grape production to 250ha and to increase the area under citrus production to 300ha. With these increases in farm size they also plan to produce their own cartons (packaging material), which will initially be capital intensive but also have great cost saving possibilities.

Management Objectives:

Denau Farming has developed a young management team over the previous five years. The management team consists of three Naudé brothers each accountable for a segment of the farm but with the focus on collaborative decision making. Beside the three brothers Denau Farming has four production managers, a financial manager, and a human resource manager. Every production manager must be developed and equipped with the necessary skills to be able to manage every aspect of the business division. Performance-orientated management systems are already in place with the goal to educate and develop production managers to a level where they can function as business unit managers.

Denau Farming has started a partnership with their employees since 2006. This empowerment transaction has given Denau Farming the ability to expand their employees' knowledge of the business goals and how to achieve these goals by exposing them to management roles. In order for Denau Farming to be able to reach these objectives financial capacity and management capacity must be developed.

5.4.1.2 mAS.05 Competitive Landscape Analysis

The Competitive Landscape Analysis identifies the strengths, weaknesses, opportunities, and threats of Denau Farming. The SWOT analysis is used as a tool to complete this process. Table 5.2 identifies all the SWOT analysis of Denau Farming in detail which gives the reader an indication of the financial weaknesses and opportunities that can be tuned into strengths with SCF.

Table 5.2: Competitive Landscape Analysis.

Strengths	Weaknesses
Workforce has potential to develop into future leaders	No sustainable quality control program in place
Family business with focused leadership	Production per hectare is average
Clear direction for successors in management	Lack of good communication of strategic planning

positions	information
Cash-driven business approach	Procedures for processes should be reconsidered
Partners in trademark as producer and exporter	Not enough control over marketing channels
Diversified products (citrus & grapes)	Management team is young and inexperienced
Short distance to port for exports	In need of a well communicated motivational system
Annual replacing policy for vines	Struggle to trust non-family managers with operational decisions
Well-developed production practices	There is no formal customer relationship management (CRM) system in place
Ethical approach towards the workforce and general business practices	Does not have own packaging material (high cost)
Production processes are completed within the given time	Final payment is received after 8 weeks
Access to key decision makers abroad	
Cash-flow generated from citrus harvest	
Opportunities	Threats
Develop new markets like Africa, Russia and China	Higher political unrest due to xenophobia, bad service provision, growing gap between the rich and poor, corruption and overpopulation as well as deterioration of infrastructure
Expand business to supermarkets like Woolworths because of the number of incoming black diamonds	Climate change
Upstream and downstream integration in the value chain	Unstable exchange rate
Business transactions with black partners	Land reform
New products/varieties that has better resistance against climate change	HIV/AIDS
More direct communication with foreign supermarkets	Buyers that are unable to pay and results into default
Ownership of exclusive new varieties developed by Hoekstra Plant Genetics	Not receiving full value of invoice for goods shipped
Receive payment earlier from buyers	
Generate cash flow to pay obligations earlier to receive a rebate	
Reduce the opportunity cost by receiving early payment	

Source: Naude, 2011.

5.4.1.3 mAS.07 Supply Chain Strategy Analysis

Table 5.3 identifies the performance goals of Denau Farming that have a direct relationship with the strategy that they are following. One of Denau Farming's performance goals is to be superior to their competitors in terms of reliability. It is not possible for Denau Farming to have a performance goal of being superior in more than one performance attribute. Responsiveness and cost is the

performance attributes in which Denau Farming has performance goals of having an advantage. Denau Farming has performance goals of being equal to their competitors in terms of agility and asset management.

Table 5.3: Supply Chain Strategy Analysis.

Performance attribute	Organisational influence	Parity	Advantage	Superior
Reliability	Customer-Facing			X
Responsiveness			X	
Agility		X		
Cost	Internal-Facing		X	
Asset management		X		

5.4.1.4 mAS.08 Supply Chain Network Definition

During the Supply Chain Network Definition process the nodes and activities that forms part of the supply chain are illustrated in figure 5.2. The nodes and activities include on-farm and off-farm responsibilities as well as internal structures and resources that enable the supply chain to operate effectively. These nodes, activities, and internal structures are catalysts for the main goal of Denau Farming which is to optimise the profit margins.

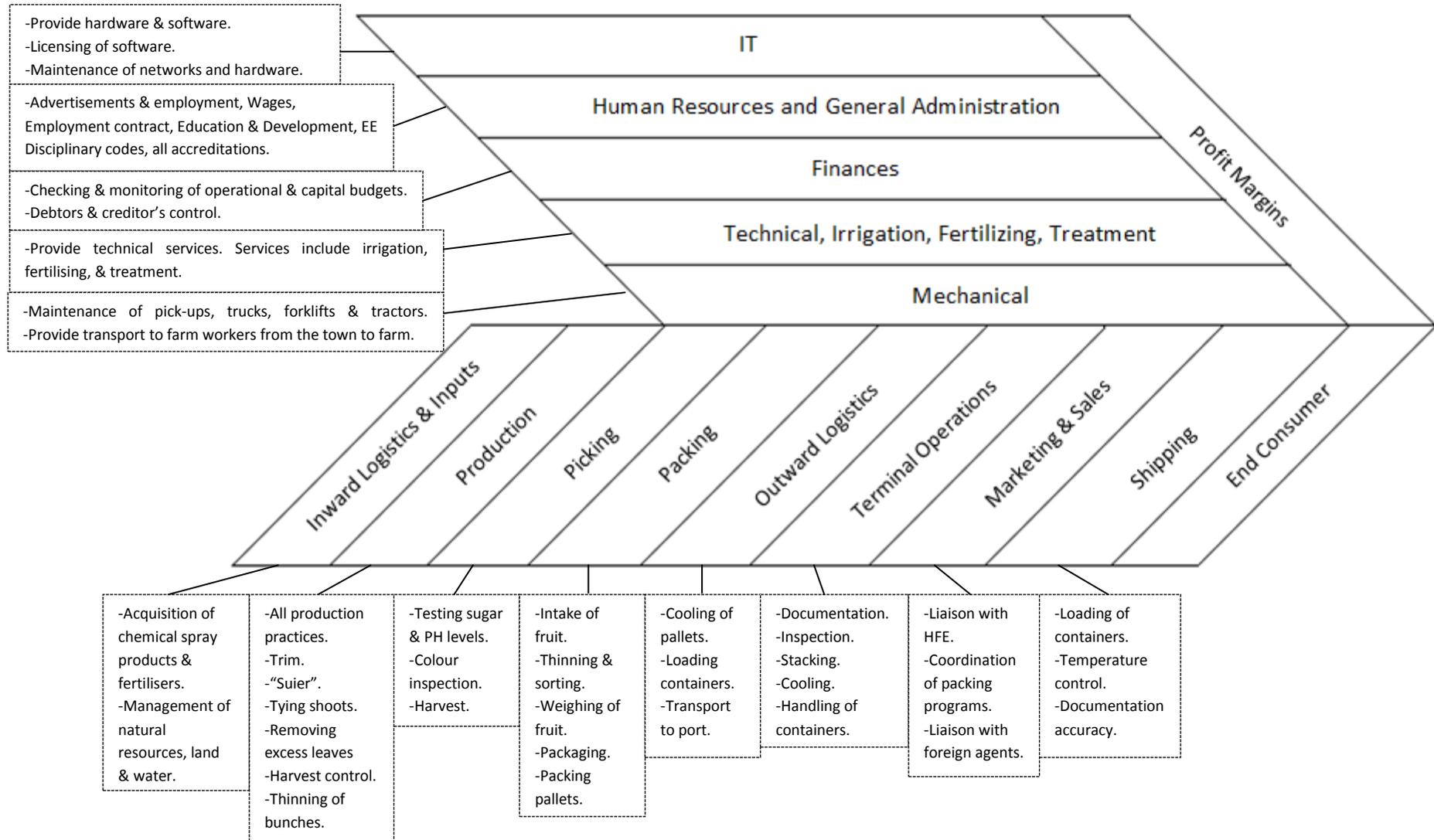


Figure 5.2: Supply Chain Network Definition.
Source: Adapted from Naudé, 2011.

5.4.1.5 mAS.09 SCORcard Definition

The metrics used to define Denau Farming’s SCORcard forms part of the financial business silo. The two performance attributes influenced are cost and asset management. The cost performance attribute value driver/metric is cost of goods sold and the asset management performance attribute/metric is the cash-to-cash cycle time. The cost of goods sold is a catalyst to be able to estimate the cash-to-cash cycle time.

This is not a balanced SCORcard since it defines only how the financial silo of the business unit is measured and not the other divisions. The reason the cash-to-cash cycle time is chosen as a value driver is because of the influence that SCF can have on it. Cost is more focused on operational efficiency but need to be calculated in order to be able to estimate the cash-to-cash cycle time. Figure 5.3 indicates the value drivers of working capital that has a direct influence on EVA®.

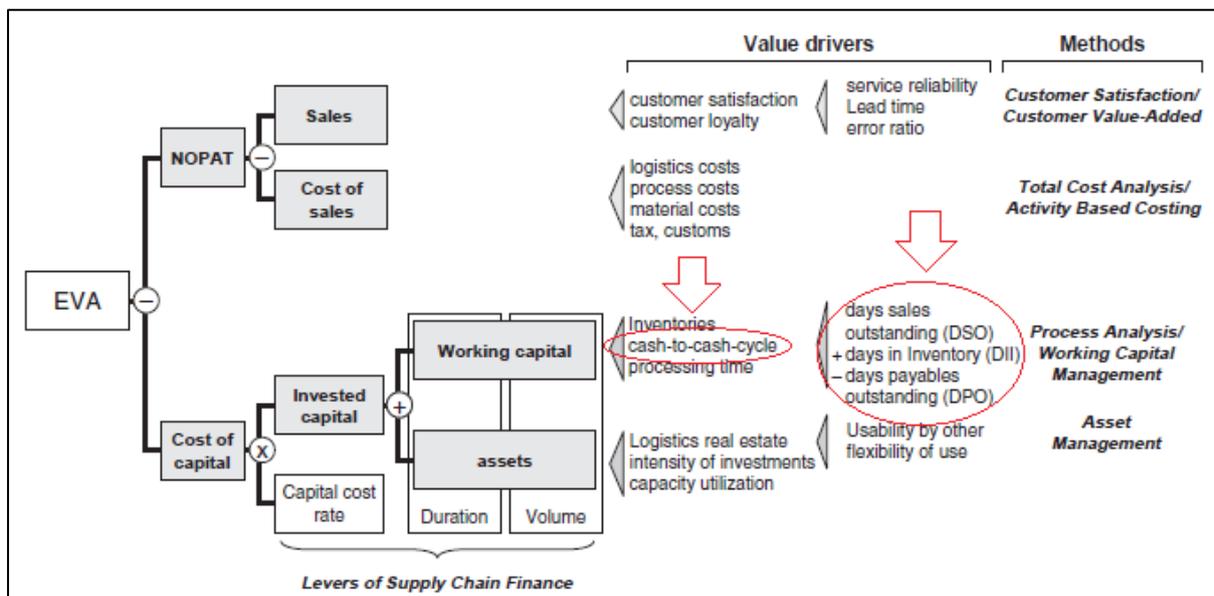


Figure 5.3: Value drivers identified that influence EVA.
Source: Gomm, 2012.

5.4.1.6 mAS.10 Supply Chain Data Collection

Resource expenses are initially captured in the organisation’s general ledger accounting system. Then these expenses are traced and assigned to the organisations “horizontal” core processes based employee time and non-wage related factors. Data for these expense distribution assignments are collected from employee time collection systems and operational systems.

The data is available for publically traded companies and rely on generally accepted accounting principles (GAAP) data (Randall, 2009). The information is founded in the flowing:

- Balance sheet: inventory, accounts receivable, and accounts payable; and
- Income statement: revenue and cost of goods sold (COGS).

Data is collected by interviewing the farmer and extracting data captured in financial statements. The challenging task is to logically transform resource expenses and operational drivers into calculated costs of the horizontal processes based on the cause-and-effect relationships without the temptation of using broad averages.

5.4.1.7 mAS.13 Supply Chain Gap Analysis

The gap was identified by the observations of the supply chain as well as interviews with Denau Farming's directors. After the interviews and observations the cash-to-cash cycle time was chosen as a performance metric to determine/prove that the cash-to-cash cycle time of Denau Farming reflects the gap in the supply chain.

The difficulty with calculating the cash-to-cash cycle time of Denau Farming is that there is no semi-finished or finished products that are captured in the financial statements to calculate the inventory days' of supply. The only inventory captured in the financial statements is packaging material that the grapes are packed into. Further, because of the time element and long duration of exporting the table grapes, and because Denau Farming produces table grapes as well as citrus fruit it is difficult to identify accounts receivables and accounts payables captured in the financial statements that is a reflection of table grape exports only. Table 5.4 indicates Denau Farming's cash-to-cash cycle time that is calculated over five years using the 5 point rolling average calculation. The cash-to-cash cycle time is calculated from the 2009 financial year to the 2013 financial year to eliminate the chances of outliers influencing the average. The average cash to cash cycle time over the five years is 114.89 days.

Table 5.4: Cash-to-cash cycle time calculation.

Year	2009	2010	2011	2012	2013	Average
Days in year	365	365	365	366	365	365
Value of inventory at standard cost	22 482 980.00	29 881 561.00	17 434 954.00	15 223 470.00	35 809 191.00	24 166 431.20
Cost of goods sold (COGS)	21 909 044.00	30 036 664.00	25 037 737.00	12 684 426.00	33 566 844.00	24 646 943.00
<i>Equiv. COGS of one day</i>	60 024.78	82 292.23	68 596.54	34 656.90	91 963.96	67 506.88
Inventory Days of Supply	374.56	363.12	254.17	439.26	389.38	357.98
Gross accounts receivable (AR)	1 066 542.00	1 522 352.00	4 180 843.00	1 354 983.00	1 422 717.00	1 909 487.40
Gross sales	40 821 425.00	38 663 979.00	31 532 772.00	37 554 133.00	75 471 976.00	44 808 857.00
<i>Equiv. gross sales of one day</i>	111 839.52	105 928.71	86 391.16	102 606.92	206 772.54	122 707.77
Days Sales Outstanding	9.54	14.37	48.39	13.20	6.88	15.56
Gross accounts payable (AP)	1 930 505.00	1 930 505.00	7 642 274.00	5 628 203.00	9 579 841.00	5 342 265.60
Gross material purchases	4 479 684.00	10 160 719.00	5 255 088.00	7 150 907.00	10 667 104.00	7 542 700.40
<i>Equiv. gross material purchases of one day</i>	12 273.11	27 837.59	14 397.50	19 538.00	29 224.94	20 654.22
Less: Days Payable Outstanding	157.30	69.35	530.81	288.06	327.80	258.65
Cash-to-Cash Cycle Time (Days)	226.80	308.14	(228.24)	164.40	68.47	114.89

5.4.2 mAN Align Network

The Align Network layer consists only as the Network Organisational Analysis process. The reason for this is that the other processes that forms part of the M4SC™ Align Network layer aim to identify gaps in the physical supply chain and to identify possible changes in the structure of the physical supply chain. Denau Farming is a well-developed table grape producer and their physical supply chain is assumed to be efficient.

5.4.2.1 mAN.04 Network Organisational Analysis

All the nodes and activities that forms part of Denau Farming's Network Organisational Analysis is described in this section. These nodes and activities are identified in section 5.4.1.4 Supply Chain Network Definition.

Inward Logistics and Inputs

Inward logistics and inputs consist of all the activities before the harvest season start. These costs include fertilising, irrigation and all practices towards efficient production. Marinus Naudé is one of the directors and also the head operational manager of Denau Farming. He is responsible for all the inward logistics and inputs regarding table grapes as well as the communication to the subordinates that are responsible to execute the activities. The subordinates include all the operational managers and labourers.

Production

Denau Farming has six operational managers that are allocated to a specific packing facility and an area of vines under production. The six operational managers each have labourers allocated to them that report directly to them. The six operational managers also report to higher management.

Picking

The three directors (Fanie Naudé, Marinus Naudé, and Pieter Naudé) set up a harvest schedule stating exactly what cultivar will be harvested at what time. The harvest schedule is constructed on the ripeness of the grapes based on historical data. The harvest schedule is then communicated to all the operational managers and labourers to ensure that every person that has a responsibility during the harvest season knows what is expected of them.

Packaging

Fanie Naudé is the marketing manager of Denau Farming and is also one of the directors. He is responsible for constructing the packing program. The packing program corresponds with the harvest schedule, which is a plan of the type of cultivar that will be packed on a specific date. The packing program is once again communicated to all the labourers and higher level managers to be able to meet goals.

Outward logistics

Outward logistics includes the cooling of pallets, loading of containers, and transporting the containers to the port. Fanie Naudé, Marinus Naudé, and Pieter Naudé are managing the packed pallets of the respective packing facilities ensuring the grapes are cooled as soon as it is packed into pallets. Fanie Naudé manages all the off-farm logistics, communicating with the transport agency at what time the truck must be ready at the cool storage facility to load the container. Fanie Naudé will communicate with Marinus Naudé and Pieter Naudé at what time the truck will be there and they will then communicate with their labourers when the truck is expected to arrive to be loaded.

Terminal Operations

The forwarders and the inland transport agency are responsible for the handling and movement of containers in the port. Fanie Naudé only communicates and manages the containers with the transport agency until the point where the grapes are loaded onto the ship.

Hoekstra Fruit Exporter acts as Denau Farming's forwarding agent but at the same time handles the finances related to the exports. They act as an intermediary between the importers/buyers and Denau Farming. Herman Louw (CEO of Hoekstra Fruit Exporters) and his team are responsible for the management of finances, incoming and outgoing. After the simulation of SCF his role will be handed over to the financial service provider.

Marketing and Sales

Fanie Naudé is the marketing manager frequently communicating with the importers for quality management. He also has to make sure that Denau Farming is adapting to the needs

of the customers by supplying the market with the most highly demanded cultivars. Fanie Naudé also has to communicate the needs throughout the whole organisation integrating it into the business model. Another responsibility of Fanie Naudé is to identify and infiltrate potential new markets.

Shipping

Fanie Naudé negotiates the shipping tariffs with the shipping lines each year, with the goal to obtain the lowest rates possible. The freight rates will influence the profit margins of exports directly.

Organisational structure

The organisational structure of an organisation has a direct influence on the nodes and activities in terms of effectiveness and flow. Denau Farming has a vertical organisational structure in place with top-down hierarchical authority and power as seen in figure 5.4. The communication structure of Denau Farming is however very different than an organisational structure with a more network based structure. This enables Denau Farming to communicate the strategy and goals throughout the whole organisation on every level.

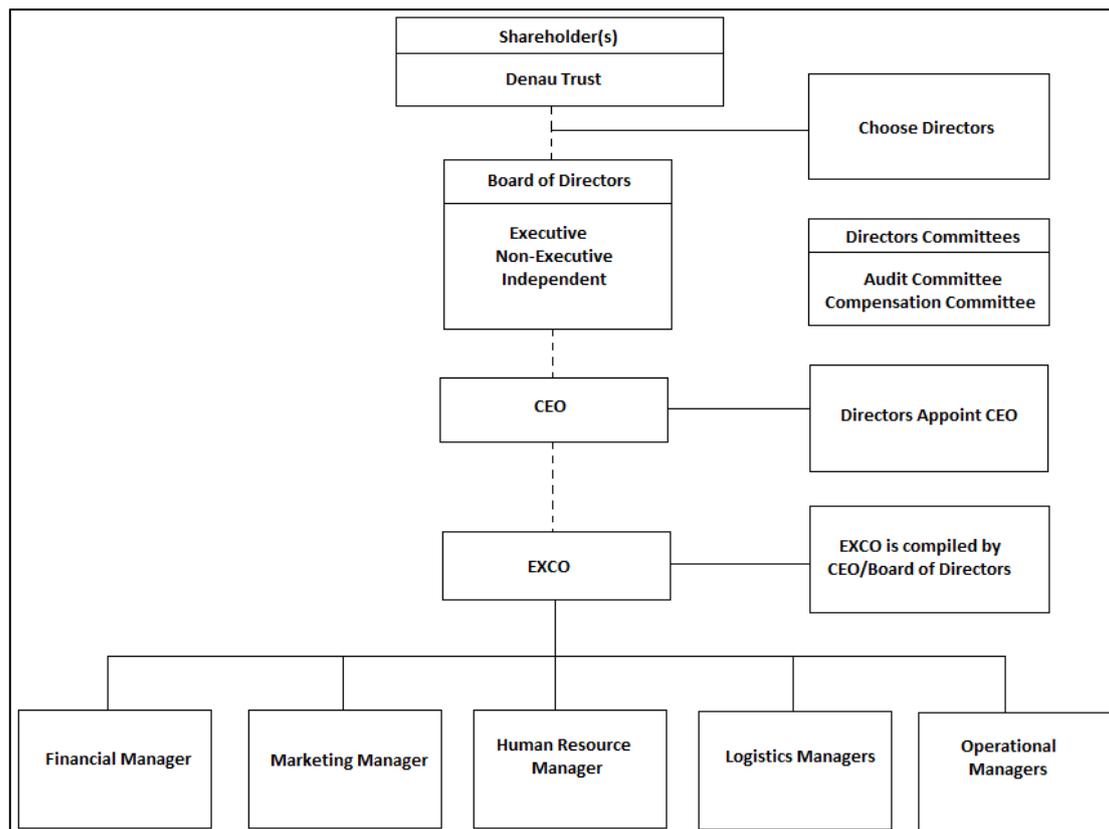


Figure 5.4: Organisational structure of Denau Farming.
Source: Naude, 2011.

5.4.3 mAP Align Processes

In the next section the Align Processes layer of Denau Farming will be explained. The management layer aims to identify Denau Farming's current financial process during exports, identifies the gap in the current financial process, define the financial process that will be simulated into Denau Farming to close the gap, and finally to explain the to-be financial process in detail.

5.4.3.1 mAP.02 As-Is Supply Chain Process Definition

The current as-is financial supply chain process is defined as financial practices that enable them to export table grapes without acquiring additional finance, only making use of internal finances as figure 5.5 identifies. They are in a financial position with the ability to meet responsibilities and obligations despite the late payment received from clients.

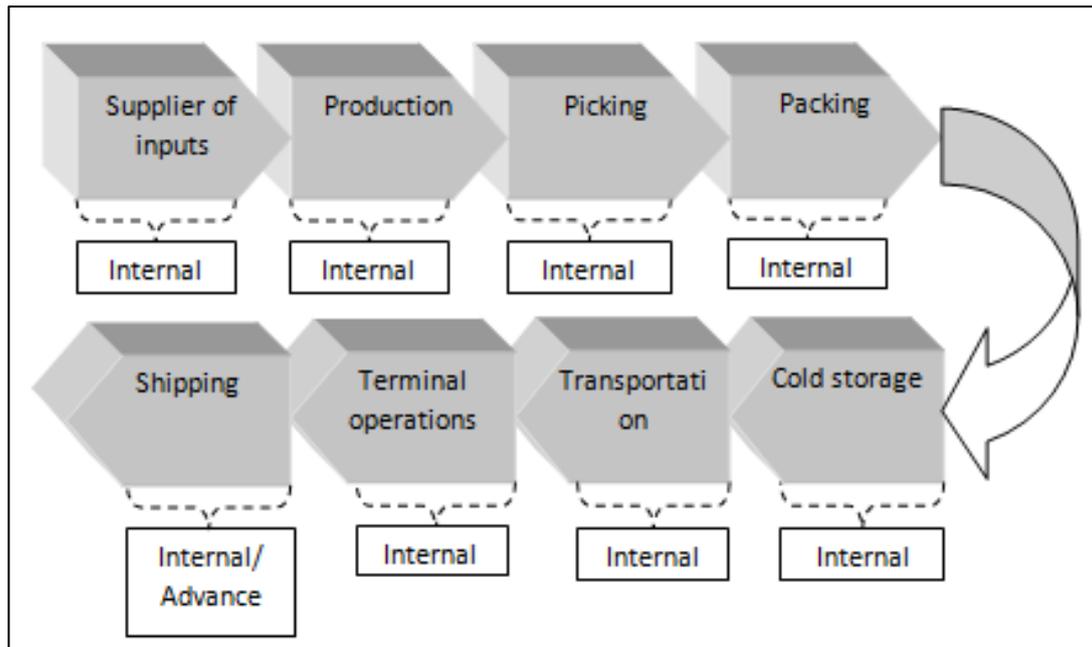


Figure 5.5: Denau Farming's physical supply chain and financial obligations.

To explain the current flow of finances the whole supply chain should be explained from the moment Denau Farming receives an order to the moment the order is fulfilled. Firstly Hars & Hagenbauer will communicate with Denau Farming telling them that they have a certain demand for a cultivar and Denau Farming will inform them about the supply available of the demanded cultivar to be shipped. The first cost that occurs other than on-farm harvesting and packing cost is the transportation cost of the container from the farm to the port. The costs is paid by Denau Farming but facilitated by Hoekstra Fruit Exporters. The next financial flow is from the activities in the port once again paid by Denau Farming and facilitated by Hoekstra Fruit Exporters. These activities include forwarding, terminal handling charge, cool storage, merchant haulage, costs for survey report, and laboratory costs (see Appendix B5)

The next cost that occurs is the shipping cost of the container to the port of destination. The shipping cost is initially paid by Hars & Hagenbauer but then Denau Farming has to pay for shipping with internal finances. The first upstream financial flow is received five days after the Bill of Lading is sent to Hars & Hagenbauer. The finance received is in the form of an advance payment for goods shipped and only covers part of the shipment cost. In other words the advance payment only covers the first couple of shipments and thereafter Denau Farming should finance their own shipments. The advance payment is estimated as a percentage of the value of the goods shipped and covers the shipping cost of the first shipment.

During the harvest season there are various running costs that occur that are reliant on available cash flow to meet these obligations. Labour cost is one of Denau Farming's largest expenses during the harvest season and has to be met in order for operations to run without disruptions. The other major cost is packing material which is usually purchased at the end of the previous financial year. Denau Farming's shipping cost, labour cost and packing material accounted for 74.42% of all operating costs during 2013.

5.4.3.2 mAP.06 Process Performance Analysis

The root causes for the delayed payment from clients in foreign markets which contributes to the long cash-to-cash cycle time is due to the long travel time combined with the long time it takes for certain documentation to be completed and processed. The long lead times for transporting the table grapes to England automatically translates into longer time to receive payment from buyers. Once the goods have arrived in the port of destination the quality check forms an important, if not the most important part of the start of upstream financial flow and approval of invoices. According to Louw (2014) this is the focal point that creates a delay in receiving payment from clients combined with letters of credit shipments. When a letter of credit is used to ensure payment from the buyer's bank, it takes much longer to receive payment than a normal telegraphic transfer. Letters of credit requires that all documentation is accurately sent to the buyers bank to be processed and then only to receive payment. Sending original documents like the Bill of Lading, Packing List, and Commercial Invoice by courier to the bank can take up to three days, while international transactions can take up to 5 days to be received by Denau Farming (Naude, 2014).

Once the table grapes have reached the port of destination and the table grapes are found to be defective the importer (Hars & Hagenbauer) will inform Denau Farming and a penalty fee is deducted from the original selling price on the invoice. This process is inefficient in terms of the flow of upstream finances back to Denau Farming and is a root cause in the delayed payment from clients.

5.4.3.3 mAP.07 Process Solution Definition

In this section the two possible SCF solutions to fill the "gap" in Denau Farming's financial supply chain will be defined. Firstly the Bank Payment Obligation will be defined and then Aztec Money's Aztec Exchange financial solution will be explained.

Bank Payment Obligation

There are various SCF solutions that could be implemented to solve the problem of delayed payment from clients and thus generating cash flow and optimizing working capital. The Bank Payment

Obligation trade finance solution during open account transactions was chosen to automate the whole supply chain and to involve Denau Farming's bank and the Hars & Hagenbauer's Bank to have hands-on involvement in the supply chain. Next, a choice had to be made on which SCF solution to implement with the Bank Payment Obligation. The decision was based primarily on reducing the time it takes for Hars & Hagenbauer to pay Denau Farming for table grape imports. The next factor that carried weight was the ability of the SCF solution to free up tied up capital in the supply chain and thus to optimise working capital.

Based on the financial statements of Denau Farming there were two outstanding solutions namely: Bank Payment Obligation with Approved Payables Finance integrated or Bank Payment Obligation with Receivables Purchase integrated. The two solutions are very similar while the difference is that Receivables Purchase allows Denau Farming to sell their receivables relating to many buyers, to their bank to receive early payment and Denau Farming's bank may elect to purchase the receivables. During this option Denau Farming's bank may require insurance and/or limited or full recourse to Denau Farming to mitigate the risk of the pool of receivables. The Bank Payment Obligation with Approved Payables integrated was chosen as a possible solution to improve cash flow, since the focus will only be on individual supply chains and not a portfolio of buyers.

To state it in simple terms this business scenario enables a bank to finance Denau Farming by placing reliance on the credit worthiness and credit rating of Hars & Hagenbauer and making use of the buyer's own credit lines. The Bank Payment Obligation also represents a conditional obligation for the buyer to pay Denau Farming, eliminating default.

The Bank Payment Obligation makes use of a baseline to match data. The baseline is a messaging platform that connects Denau Farming's bank with the Hars & Hagenbauer's bank, known as the Transaction Matching Application (TMA). The TMA enables the buyer's bank and Denau Farming's bank to exchange structured messages to come to a mutual agreement as to what the baseline for a particular transaction should look like. If the initial baseline Submissions of both banks are the same (i.e. they match), then the Baseline becomes established. If that Baseline contains the optional component of a Bank Payment Obligation, then the Bank Payment Obligation also becomes established (International Chamber of Commerce, 2013). The data elements that must be presented by Denau Farming's bank are defined by the Established Baseline and subsequently be presented by Denau Farming's bank in order for the Bank Payment Obligation to become due.

The TMA is only the way in which Denau Farming's bank and Hars & Hagenbauer's bank will communicate with each other and the Bank Payment Obligation is the security to get paid by the

importer, while the real cash flow solution and to receive earlier payment from Hars & Hagenbauer is to implement the Approved Payables/Reverse Factoring with the Bank Payment Obligation. As defined in Section 3.4, during Approved Payables/Reverse Factoring Denau Farming sells the invoice of the goods shipped to their bank of which payment is outstanding receiving the payment from the bank earlier at a discounted rate, while the buyer pays the bank back at the original time agreed upon initially.

Aztec Money

The second possible solution to improve the cash-to-cash cycle time and optimising working capital for Denau Farming is Aztec Money's SCF solution. Aztec Money provides an export trade finance service that the exporter controls to provide working capital funding certainty called Aztec Exchange. Aztec Exchange is attractive to Denau Farming because it can be facilitated by open account transactions. Denau Farming can thus avoid making use of letters of credit that can be expensive and where Denau Farming's credit rating has to be checked.

Aztec Money created a platform on which the exporter can sell his invoice on the Aztec Market to the buyer with the highest bid using the Aztec Exchange platform. The exporter chooses the sale terms for the export invoice that provides the supplier with two fields to complete. The exporters choose the amount that they want to receive immediately and they choose the invoice face-value discount. The principle is simple, because the exporter receives cash immediately and they get a discounted percentage of the invoice value, but the difference from other solutions is that the exporter controls the amount discounted.

It is important for the exporters to not request a value that they want immediately that is too high and a discounted percentage from the invoice that is too low, to keep the bidders interested. Exporters are also able to watch bidders compete to buy the invoices as it happens online. Aztec Money gives the opportunity to assist the exporters in choosing the optimum value to receive for the invoice and the discount to be subtracted from the invoice.

After a successful transaction Aztec profits a percentage of up to two percentile points of the invoice value being sold. The transaction fee is seen as the cost for managing administration and payments. There is also no charge to the exporter if a transaction is unsuccessful. Figure 5.6 shows how much cash Denau Farming is able to generate immediately after selling an invoice on Aztec Exchange as well as the total receivable cash. The cash calculator is available on Aztec Money's website with adjustable variables.

Choose Your Sale Parameters

This section can help you understand the auction price settings

Your Invoice Value

① What is the discount rate you are willing to pay each 30 days? (max 8% per 30 days) % = **1,000.00**

② How many days until your invoice is **due** to be paid? (maximum 180)

③ How much do you want now? (maximum 80.00%) % = **80,000.00**

Cash You Receive

Invoice Total	100,000.00
Fees for this transaction	
Maximum Aztec Fee	2,000.00
Invoice discount amount ④	1,000.00
What you will receive	
You are advanced upfront	78,000.00
Paid to you on settlement	19,000.00
<hr/>	
YOUR AZTEC MONEY	97,000.00

Figure 5.6: Aztec Exchange Cash Calculator

Source: Aztec Money

This is the % of invoice value you would be willing to pay to the Buyer of your invoice for every 30 days your invoice remains unpaid. For example, if you enter 1% and

- your invoice is paid in 30 days you will pay the Buyer 1%,
- your invoice is paid in 60 days you pay 2%,
- your invoice is paid in 15 days you pay 0.5% etc.

The % amount is deducted when your invoice is fully paid. 1

Figure 5.7: Explanation of Aztec Exchange Discount rate

Source: Aztec Money

Enter the number of days, from today, you expect full payment from your customer to settle the invoice. 2

Figure 5.8: Explanation of Payment Terms

Source: Aztec Money

This is the amount of cash you want to receive immediately upon selling your invoice in the Aztec Money auction. It is specified as a % of the invoice value.

You cannot receive more than 100% of the value of the invoice. The difference between the total invoice value and the amount advanced should be at least enough to cover the discount owed to the Buyer.

The Calculator will help you to calculate the maximum cash you can receive upfront. 3

Figure 5.9: Explanation of the amount of money that Aztec Exchange instantly can provide
Source: Aztec Money

This is the amount that is paid to the Buyer of your invoice when your invoice is fully repaid. It is calculated as the 30 day discount rate you entered [x] invoice value [x] (the number of days your invoice was outstanding / 30). 4

Figure 5.10: Explanation of the discount Rate of selling invoices on Aztec Exchange
Source: Aztec Money

Figures 5.7 – 5.10 explains the Aztec Exchange cash calculator to give the seller of the invoice an indication of the advance cash receivable immediately and the cash to be received on settlement. Unlike banks and factoring agencies, Aztec Money invests in the exporters invoice and does not lend against the exporters business. Aztec money is interested in the person/business that owes the exporter payment, thus the invoice is sold to a buyer who carries the risk on the payment on the exporters behalf for a discount on the invoice. Aztec firstly trades with one invoice and then plans to get financed for all the invoices for the rest of the financial year.

Aztec follows a similar model to that of a reverse factoring SCF model. The difference is in the way that the finances are obtained to pay the exporter of the goods. In a reverse factoring model the finances to pay the exporter originates from a bank or financial service provider that buys the invoices from the exporter and when Aztec Money's service entails that invoices are sold to a third party to obtain the finances paid to the exporter.

5.4.3.4 mAP.08 To-Be Process Definition

During this section the Bank Payment Obligation and the Aztec Money solution are described in detail. The focus is emphasised on how the financial supply chain will be influenced if either of the models are implemented into Denau Farming as a solution to close the gap.

Bank Payment Obligation

The first step to implement the Bank Payment Obligation with Approved Payables finance will be to get Denau Farming's bank and the buyer's bank on-board with the business strategy. The same Transaction Matching Application scheme should be implemented into Denau Farming's bank as well as the buyer's bank. There are various TMA platforms available to choose from like the SWIFT Trade Services Utility platform or any other registered solution that is capable of processing the set of ISO 20022 TSMT messages.

Denau Farming will receive a purchase order from Hars & Hagenbauer of the quantity and variety of grapes demanded. Denau Farming will confirm that the amount demanded from the client is available for shipment.

The first step will be to establish the baseline without a Bank Payment Obligation. It is important to keep in mind that the Bank Payment Obligation cannot be created after submission of matching data sets. Figure 5.11 shows how to establish the Baseline without the Bank Payment Obligation.

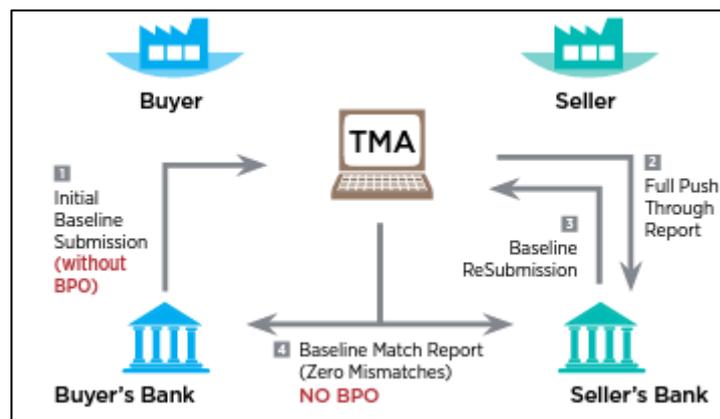


Figure 5.11: Baseline establishment without a BPO.
Source: International Chamber of Commerce, 2013.

Since Denau Farming has the ability to pay for expenses up until the shipment of goods and does not have an early requirement for finance but only later in the transaction lifecycle, they will still make use of Hoekstra Fruit Exporters as their logistics service provider to account for all origin costs depending on the Incoterms® 2010. These costs include forwarding costs, terminal handling charges, cool storage, merchant haulage, costs for survey report, laboratory costs, and transportation costs (from Denau Farming to the port). The only difference will be that Denau Farming's bank will receive the payment rather than Hoekstra Fruit Exporters in the as-is operations. In short Hoekstra Fruit Exporters will only serve as a third party logistics service provider that Denau Farming is a shareholder of.

Before the goods are shipped the buyer will pay an advance at the value of the shipping cost exactly as it take place in the current situation. The next step, when the goods have been shipped and the documents have been sent directly from Denau Farming to the buyer, Denau Farming submits the data to their bank but requests that they keep open the possibility of providing finance against the selected invoices. This step is illustrated in figure 5.12.

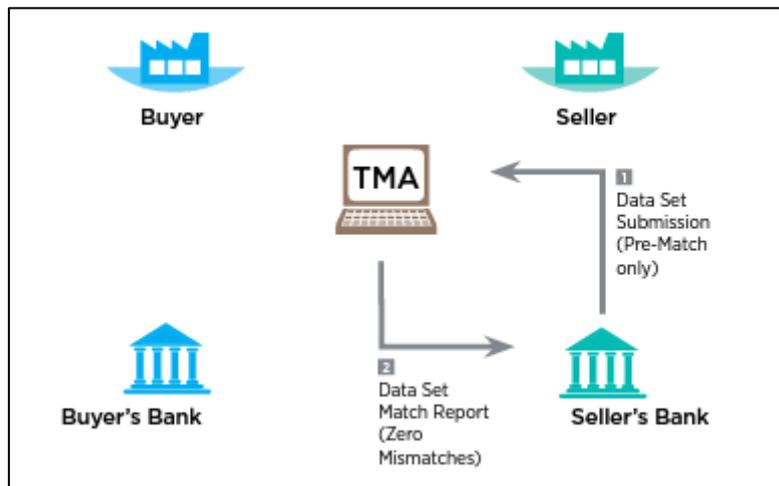


Figure 5.12: Submitting data for a pre-match, Denau Farming's bank retains the option to create a BPO.

Source: International Chamber of Commerce, 2013.

Figure 5.13 illustrates when data is pre-matched and amendment request to establish a BPO. Denau Farming's bank will request a "pre-match" in order to retain the possibility of creating a Bank Payment Obligation (the baseline has been established without a BPO) against the related invoices. Denau Farming's bank will have to send a baseline amendment request message after the data-set pre-match to be able to create a BPO. The buyer's bank will receive the request via the TMA and must agree to the amendment by sending an amendment acceptance via the TMA. The BPO will now come into force after the amended baseline has been accepted.

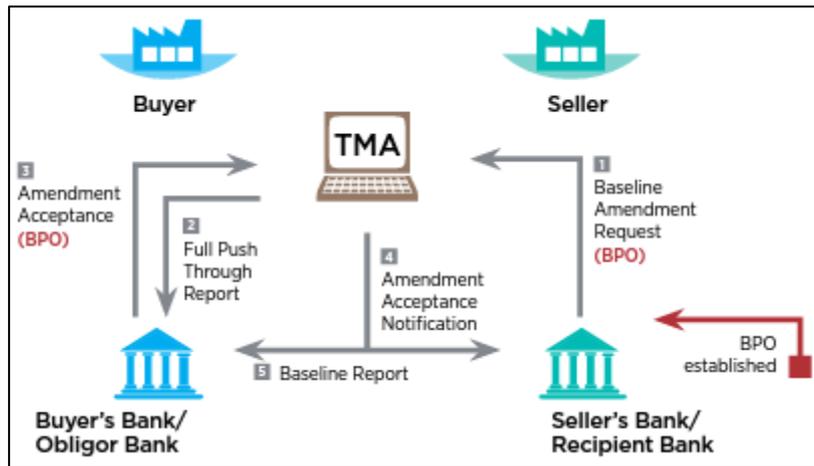


Figure 5.13: If Hars & Hagenbauer's bank accepts the Baseline Amendment Request, the BPO is established. Hars & Hagenbauer's bank becomes the Obligor bank and Denau Farming's bank the recipient bank.

Source: International Chamber of Commerce, 2013.

The data sets can now be submitted for full data matching by Denau Farming's bank (the recipient bank) after the BPO has been established. Denau Farming's bank knows that the data sets will match, having already submitted the data for successful pre-match, thus the BPO will become due. The data set submission for full data matching is illustrated in Figure 5.14.

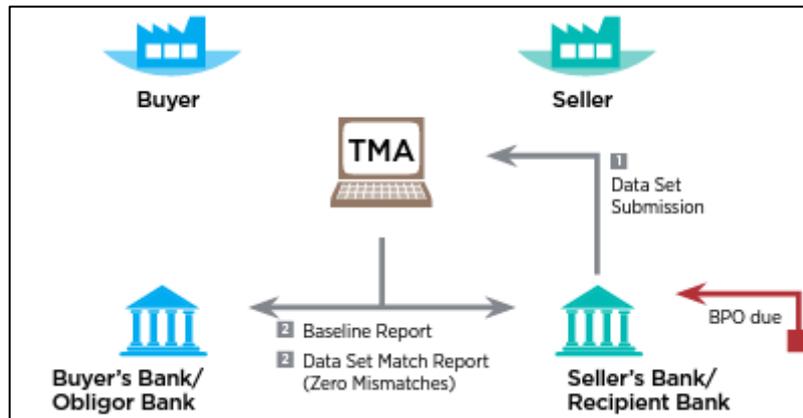


Figure 5.14: When the data sets are successfully matched to the Established Baseline, the BPO becomes due.

Source: International Chamber of Commerce, 2013.

The majority of the payments from clients during the as-is process has deferred payment terms, the BPO will also have deferred payment terms. This gives Denau Farming's bank the possibility to finance Denau Farming, placing reliance on the BPO of the buyer's bank (the obligor bank) as its source of repayment.

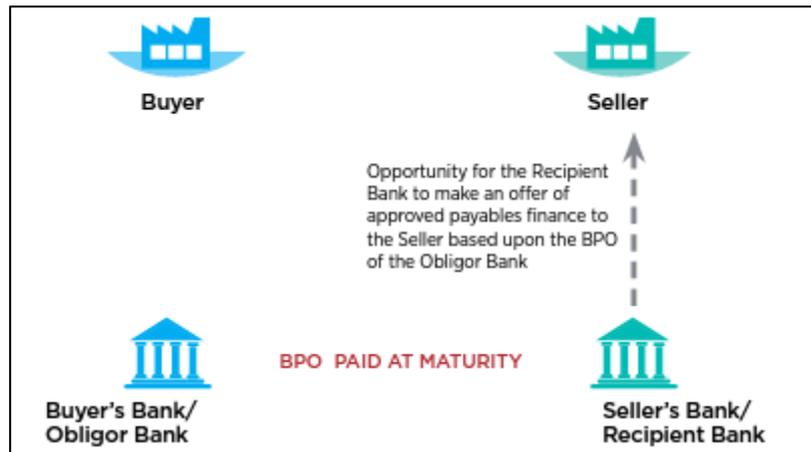


Figure 5.15: Denau Farming's bank/recipient bank can finance Denau Farming directly using the BPO of Hars & Hagenbauer's bank as collateral.

Source: International Chamber of Commerce, 2013.

In terms of the finance provided to Denau Farming in the form of selling their receivables, Hars & Hagenbauer's credit rating will be evaluated instead of Denau Farming's credit rating and will typically have an investment grading of A or BBB. This means that the obligation exhibits adequate protection parameters and changes in economic conditions will unlikely result in default. After the data matching and data matching acceptance Denau Farming will request early payment from their bank, while the buyer's bank will only pay Denau Farming's bank on the original due date. Denau Farming can expect to receive the payment in their account after four to six days. The time varies depending on the bank that provides the finance because various different factors influence the processing and transfer time. Figure 5.15 shows the process of finance provided to Denau Farming via Approved Payables Finance.

Denau Farming's bank will provide Denau Farming with finance at the value of the invoice minus a percentage. The importer's bank will pay Denau Farming's bank back on the original due date. The result is a win-win-win situation where Denau Farming receives early payment to meet obligations, the buyer gets to delay payment enabling them to sell goods even before paying for it, and both banks are generating business and improving supplier relationship.

Aztec Money

Before Denau Farming can implement Aztec Money's SCF solution in their business model there are various steps that need to be taken. Denau Farming firstly needs to register online, via fax or post to be able to use Aztec Money's services. During registration Aztec Money does not have to do a credit check of Denau Farming or have to pay any membership fees.

Aztec Money acts only as a bank to release tied up capital thus Denau Farming can continue their current as-is operations only changing the financial flow in terms of the time in which they receive payment for grapes exported. After a shipment has been sent to Hars & Hagenbauer and has an invoice value of the grapes exported the invoice can be uploaded on Aztec Exchange. Denau Farming will have their own account to monitor the activity and progress of selling the invoice. A sales request of multiple invoices are possible for grapes provided to a single buyer and if all the invoices are settled by a single buyer.

Hars & Hagenbauer is the debtor and the person bidding and eventually buying the invoice is the investor or asset manager. Only the credit rating of the debtor (Hars & Hagenbauer) is checked to assess the risk of default. Hars & Hagenbauer is able to pay for the grapes on the original due date while Denau Farming (or Hoekstra Fruit Exporters) can expect to receive the money in their account 2-5 working days after the invoice is sold on the Aztec Market.

There is some risk exposed to the investor in case the debtor goes out of business and can't pay for the goods shipped. This is highly unlikely to occur since Hars & Hagenbauer is a very large international importer that buys fruit from all over the world during different harvest seasons that enable them to have cash available throughout the year to pay suppliers.

Aztec Money finances the grapes sold on FOB terms. This means that the goods will only be financed until the goods are loaded onto the ship at the port of origin. Once the ship departs the obligations transfers to Hars & Hagenbauer and is accountable for any liabilities. Figure 5.16 illustrates the whole process of selling invoices on Aztec Exchange in detail,

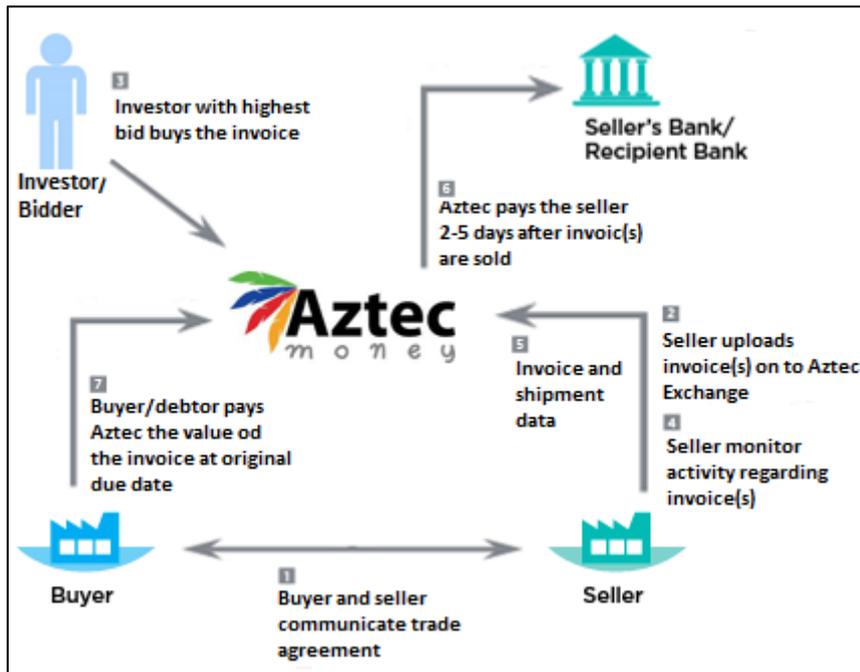


Figure 5.16: Aztec Exchange SCF model.

Source: Devine, 2014.

5.4.4 mAR Align Resources

The Align Resources management layer of Denau Farming is described after BPOs and Aztec Exchange is simulated. The Process Change Portfolio Analysis describes how the supply chain strategy of Denau Farming changes after implementing both solutions respectively. The Technology Assessment layer identifies the respective technology changes required after both solutions are implemented.

5.4.4.1 mAR.01 Process Change Portfolio Analysis

After the Supply Chain Strategy analysis it is clear that Denau Farming's supply chain strategy is to be superior to their competitors in terms of being reliable to deliver high quality grapes in perfect condition. Denau Farming's supply chain strategy is much more customer-facing than internal-facing, with a supply chain asset management strategy to be on par compared to their competitors. This means that they don't plan to have a competitive advantage or to be superior to their competitors in terms of cash-to-cash cycle time, return on supply chain fixed assets, and/or return on working capital.

Denau Farming must understand the financial effects that being superior or having an advantage to their competitors in asset management can have on their business. After the implementation of the

BPO with Approved Payables Finance and Aztec Money's SCF solutions into their business structure their supply chain asset management strategy will already be shifted from parity to advantage or even superiority, because the goal of the BPO with Approved Payables Finance is to automate the supply chain documentation and information exchange and to improve the cash flow and thus optimising working capital. The objective of Aztec Money solution is also primarily to improve Denau Farming's cash flow by reducing the cash-to-cash cycle time and to reduce the occurrence of default. The difficulty will be to get the whole organisation and all the supply chain members to support the strategy shift during on-boarding.

In order to make use of Aztec Money's SCF solutions does not require major changes in resources. Making use of Aztec Money's services only requires the time to upload invoices onto the Aztec Exchange, and Denau Farming can continue with their operations as usual. While in order for Denau Farming to implement the BPO with Approved Payables Finance successfully there are certain changes in demand towards available resources. These changes in resources include:

- Project manager
- Financial institution
- Additional finances for on-boarding

Denau Farming will find it very useful if they appoint a project leader for the implementation of the Approved Payables Finance facilitated by the BPO. This will give accountability to the project to meet expectations. The financial service provider that can facilitate the solution must be chosen if their current bank does not have the capabilities. The bank should have a sustainable customer base that can facilitate business with various buyers, not only Hars & Hagenbauer. Denau Farming should make provision for additional finances during the on-boarding process. These finances can include provisions for the salaries of new employees needed for the project. Also additional charges by the bank should be provided for like risk-taking levies and operational costs for banks.

5.4.4.2 mAR.04 Technology Assessment

Bank Payment Obligation

Denau Farming currently has EDI hardware and software to exchange data and information. In order to implement the BPO the same messaging platform should be implemented into Denau Farming's bank and the buyer's bank, known as the Transaction Matching Application. This will enable the two banks to exchange the BPO-related data.

Subscription to the Transaction Matching Application is normally restricted to eligible financial institutions and have to pay an annual subscription fee. The internal communication as a result of a new business structure will have to be adapted and improved to eliminate possible mistakes. Denau Farming will be able to use their EDI hardware and software to communicate with buyers as they are currently doing.

Aztec Money

Aztec Money requires no additional investment in technology platforms or applications. The only requirement is that Denau Farming loads the invoice onto Aztec Exchange via a computer using the internet. Denau Farming will also be able to use their current EDI hardware and software to communicate with buyers, as is the case during the Approved Payables Finance. A technological advantage of selling invoices on Aztec Exchange is that it can be done from anywhere in the world with internet connection. From a technological perspective there is saving potential in terms of marketing. The invoices are taken to the buyer rather than Denau Farming pursuing new markets in foreign countries.

Chapter 6: Data Analysis and Interpretation

6.1 Introduction

During this chapter data analysis of the cash-to-cash cycle time calculated in section 5.4.1.6 Gap Analysis is explained. Only the high level asset management metrics (level-1 and level-2) are analysed and compared since it forms part of top-level strategy management. Since no benchmark exists for cash-to-cash cycle time for table grape farms it will be compared with internal competitive data. The current cash-to-cash cycle time is compared to the cash-to-cash cycle time after the two SCF solutions are simulated into Denau Farming's business model.

Since the cash-to-cash cycle time influences EVA[®] directly, the effect of the cash-to-cash cycle time on EVA[®] is analysed and explained. EVA[®] attempts to capture the true economic profit of a company and is a good measure of financial efficiency and is a reflection of management performance.

6.2 Cash-to-Cash Cycle Time

In this section Denau Farming's as-is cash-to-cash cycle time is analysed in detail. The as-is cash-to-cash cycle time is analysed to place emphasis on the financial gap that is experienced in terms of cash flow.

As-Is Cash-to-Cash Cycle Time

Before the current cash-to-cash cycle time of Denau Farming is explained there are a number of factors to keep in mind. It is important to note that Denau Farming is producing table grapes and citrus fruit and that the financial statements and thus the cash-to-cash cycle time is a reflection of both table grapes and citrus fruit.

Denau Farming's financial year ranges from January until December while their harvest season ranges from November until April. The problem where they wait for late payment from buyers occur during the harvest season and the reflection on late payment is mitigated into two separate years' financial statements.

Also due to the nature of table grapes Denau Farming never carries any stock on hand in the financial statements, because the table grapes in its finished state ready for consumption are only in the cold store between one and four days on average. This leads to the calculation of the value of

inventory at standard cost during the estimation of the cash-to-cash cycle time. Standard cost is the expected value of goods after it is turned into its final state ready for consumption.

The value of inventory at standard cost reflects all the direct costs related to the production, harvest and packing of the grapes to its final state ready for consumption. The calculation of the value of inventory at standard cost is the sum of direct material, direct labour and manufacturing overhead. Direct material is only the packing material, fertilisers, sprays, and technical costs. Direct labour is the labour costs related to the production and picking of the grapes. The manufacturing overhead includes all other indirect costs related to the packing facility. These costs include inspection costs, handling costs, and depreciation on the packing and cool storage facilities and depreciation on the packing machines. The five year annual cash-to-cash cycle time of Denau Farming is illustrated in figure 6.1.

Denau Farming has an average cash-to-cash cycle time of 114.89 days. The average inventory days' of supply was estimated at 363.86 days, while the average days' sales outstanding and the average days' payable outstanding are 18.47 days and 274.50 days respectively.

The relationship between the cash-to-cash cycle time and working capital is what illuminates cash availability and liquidity. The cash-to-cash cycle time is a good measure of liquidity compared to more traditional static measures because it incorporates the element of time.

The formula can be interpreted as the shorter the cash-to-cash cycle time the more liquid the working-capital position is. The inventory days' of supply measures the number of days a company takes to convert its inventory into sales. Denau Farming's inventory days' of supply is very high because of the high cost of goods sold compared to the value of inventory according to standard costing. It can be interpreted that Denau Farming takes 364 days to turn inventory into sales. This is actually not a true interpretation since the grapes only stays for two to five days on average on the farm before it moves to the port to be shipped as sales.

The second part of the formula, days' sales outstanding, measures the number of days to collect sales. Denau Farming's average days' sales outstanding are 19 days, which is not very high. This phenomenon can be traced back to the element of time in which the cash-to-cash cycle time is calculated. The cash-to-cash cycle time is estimated for the whole financial year in which most of the payment from buyers is already received thus it is not a true reflection of the actual situation.

The final part of the cash-to-cash cycle time is the days' payable outstanding which is the number of days that Denau Farming is able to defer payment of its accounts payable. Denau Farming's average days' payable outstanding is 275 days. The reason Denau Farming's days' payable outstanding is high is because they buy large amounts of packing materials at the end of each year for tax reasons. This

influences the cash-to-cash cycle time in such a way that would change it to a large extent if this would not have been done. The days' payable outstanding can be interpreted by the length of time that Denau Farming can obtain interest free financing through credit relationships with vendors. The longer they are able to delay payment the better their working capital position.

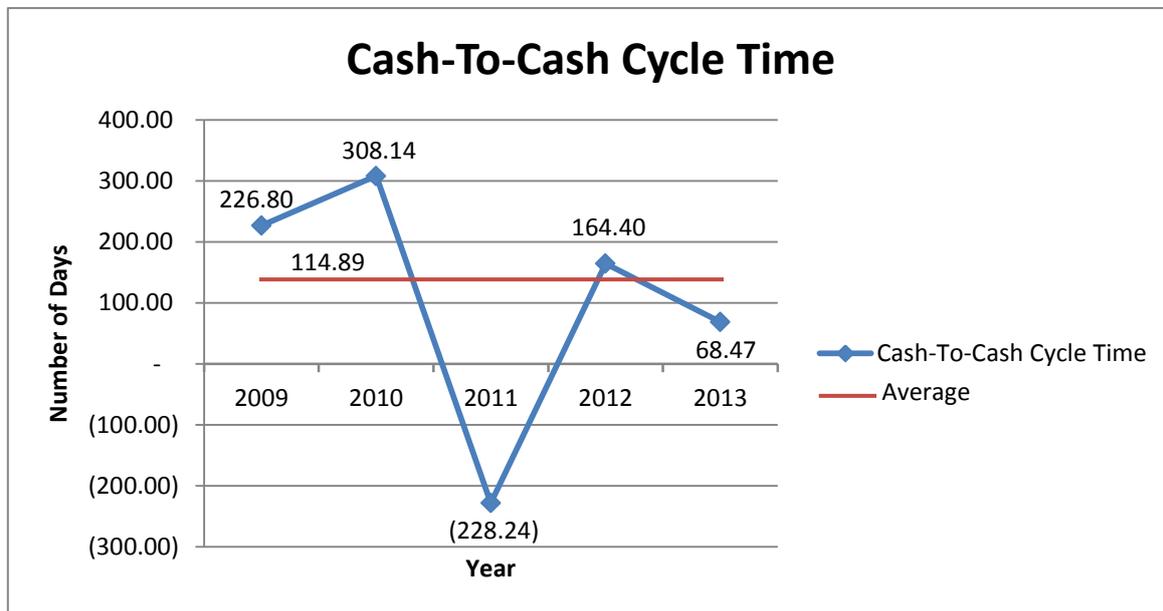


Figure 6.1: Cash-to-cash cycle time of Denau Farming.

It is possible to have a negative cash-to-cash cycle time as in the 2011 financial year. This means that they managed their working capital very efficiently during that year in terms of paying for input costs and selling grapes. This also means that Denau Farming is managing the collection of the receivable before the corresponding payable from the input acquisition are due efficiently (see gross accounts receivables and gross accounts payables in table 5.4). Negative cash-to-cash cycle time does not mean that the problem of late payment from buyers is resolved it just shows that Denau Farming has adequate working capital available to meet obligations and more cash flow available for other costs. There are a number of elements that should be considered when looking at the cash-to-cash cycle time and is difficult to quantify the figure exclusively.

During every other financial year the cash-to-cash cycle time was positive which is a better indication of the effect that late payment received from Hars & Hagenbauer has on Denau Farming's financial statements. During 2009 and 2010 the cash-to-cash cycle time was 226.80 days and 308.14 days respectively. These figures are a reflection of the input costs that starts in July and payment that is received from exports in March. During 2012 the cash-to-cash cycle time was 164.40 days which is much lower than the 2011 and 2012 financial year. The 2013 financial year had the lowest cash-to-cash cycle time of the five years. The reason for this occurrence is that the account receivables and the account payables were managed efficiently that lead to high account payables and low account

receivables during this period. In other words they managed to extend their credit line with creditors by delaying payment and they managed to shorten the time in which debtors pay for grapes exported.

The goal is to keep the cash-to-cash cycle time as low as possible (zero) or negative. Denau Farming's 5 point rolling average cash-to-cash cycle time is positive 114.89 days. A simple interpretation of this figure would be that Denau Farming takes 115 days on average from the moment input costs occur to the moment they received cash for selling grapes. It would be ideal for Denau Farming to reduce the cash-to-cash cycle time to optimise working capital and reduce the chances of not being able to meet obligations. The risk of having a high cash-to-cash cycle time arises due to Denau Farming's ability to meet the high costs that occur during the harvest/export season and before the harvest/export season.

Due to the fact that the financial year ranges from January to December the problem of late payment is spread over two financial years. Denau Farming's first costs occur in June while their final payment received for goods sold is received in April. If the cash-to-cash cycle time is calculated for the six month period from November to April, the figures would look entirely different and probably give a better indication of the effect of late payment received by buyers.

6.3 Economic Value Added

The expected effect that the two SCF models would have for Denau Farming's EVA[®] is investigated in this section. The change in the cash-to-cash cycle time is one of the value drivers of working capital and working capital directly influences EVA[®]. Only the expected change in cash-to-cash cycle time will be identified and its effect on EVA[®] investigated, ceteris paribus. The reason for this is that the changes in the cash-to-cash cycle resulting from the two SCF models are only visible after they are implemented into Denau Farming's business model. The research did not include the implementation of the models but only proposing these models as possible solutions to optimise Denau Farming's working capital and the effects it will have on their whole business.

From the case study it is clear that both the BPO with Approved Payables Finance and Aztec Money will decrease the cash-to-cash cycle time. This result is expected because Denau Farming will be able to receive payment from Hars & Hagenbauer about two to five working days after the respective models have been implemented. This means that Denau Farming's accounts receivables will reduce by the total value payable by Hars & Hagenbauer while Denau Farming will pay the creditors at the original due date as in the current operations. The net effect of this occurrence is that the cash-to-cash cycle time will be reduced.

The effect of reducing the cash-to-cash cycle time is that Denau Farming will optimise working capital and thus have cash available for unforeseen difficulties. The expected effect on EVA[®] is that working capital will be lowered by reducing the amount owed by buyers. The ripple effect that a change in working capital due to a change in the cash-to-cash cycle time has on EVA[®] is illustrated in figure 6.2.

Figure 6.2 shows the effect that a 2% decrease in working capital can have on Denau Farming's EVA[®]. The figure is based on Denau Farming's 2013 financial statements. Denau Farming's EVA[®] is R24.77 million which can be interpreted as a sign that Denau Farming has made enough profit during 2013 to cover their cost of doing business.

After the implementation of the two SCF models the expected effect is that the cash-to-cash cycle time will decrease and thus reducing working capital and capital employed, with the end result is that EVA[®] increases. To show the sensitivity of a change in working capital due to a lower cash-to-cash cycle time, the EVA[®] model in figure 6.2 is used as an illustration. It is important to keep in mind that the weighted average cost of capital (WACC) is based on Liebenberg's (2004) research on determining the EVA[®] for different agricultural cooperatives in South Africa and the average WACC estimated for the Overhex is used in the illustration. By decreasing the working capital by 2% the EVA[®] of Denau Farming increases by 0.52%. This will translate into an increase of Denau Farming's EVA[®] from R24.77 million to R24.9 million by reducing the working capital by R810 000. This is an indication that Denau Farming's EVA[®] is not extremely sensitive to a change in working capital.

EVA Model (Rm)

ROI Model (Rm)

Value drivers

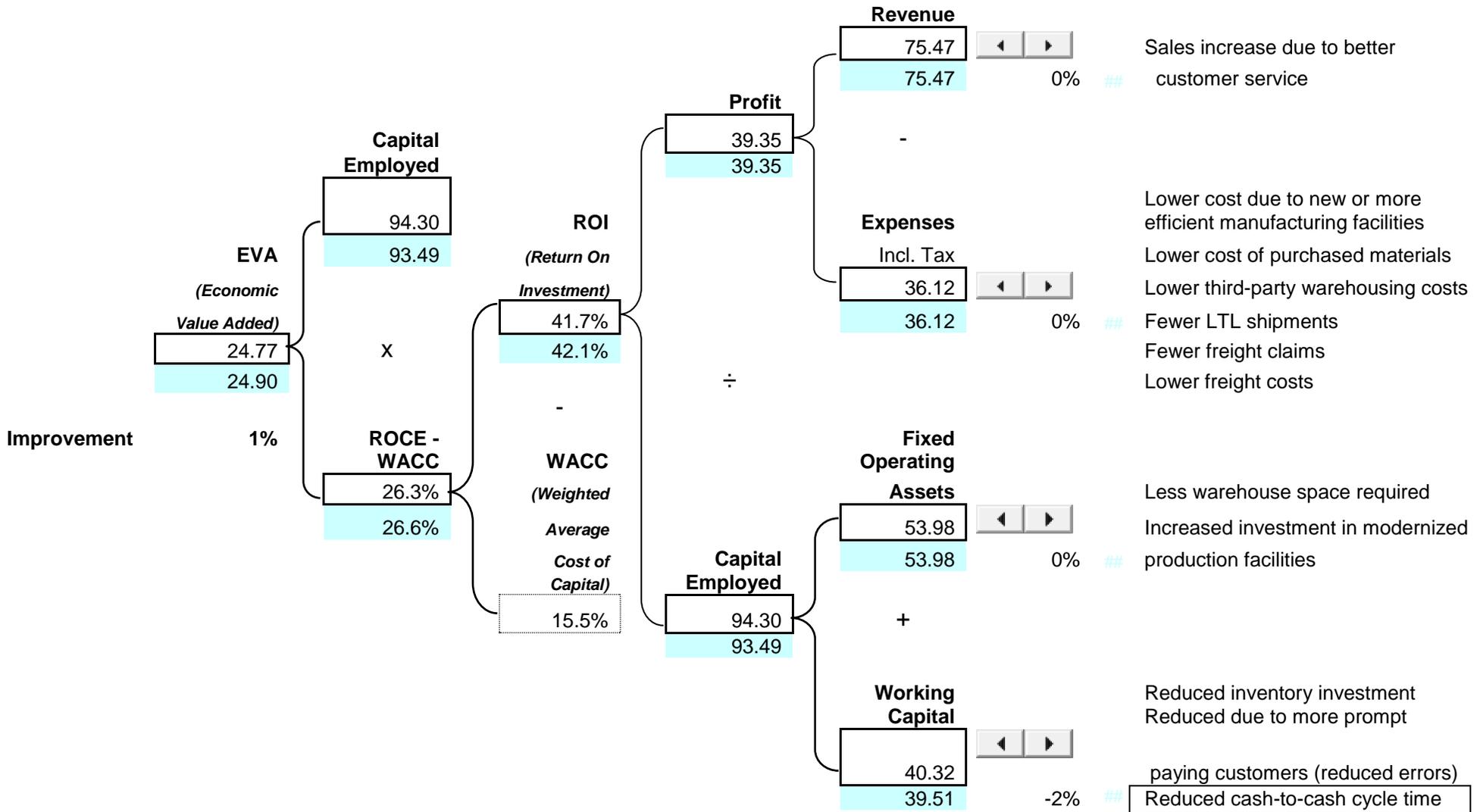


Figure 6.2: Expected effect of reducing Denau Farming's working on EVA®.

Based on the findings of Bolek *et al.*, (2012) the expected result of the implementation of the two SCF models respectively is that the EVA[®] will increase. It is however important to note that other factors that can possibly influence the cash-to-cash cycle time after the implementation of the proposed SCF models should also be considered.

The effect that BPO with Approved Payables Finance and Aztec Money has on EVA[®] respectively has on EVA[®] are dependent on a number of factors. The total payment that Denau Farming receives early on the invoice will determine the extent to which EVA[®] will change. The higher the percentage of the total invoice value each model can offer Denau Farming, the lower the cash-to-cash cycle time and the more EVA[®] will increase.

Also the time in which each model will release tied up capital in the supply chain will have an effect on EVA[®]. The BPO with Approved Payables Finance will transfer the percentage of the invoice value that they agreed upon into Denau Farming's account in about five working days on average, while Aztec Money can have the funds in Denau Farming's account in two to five days on average. The quicker the funds can be transferred into Denau Farming's account the lower the cash-to-cash cycle time will be and thus the lower the working capital and the higher the EVA[®] will be. In this field Aztec Money is able to increase EVA[®] more because this model is able to have the money of the sold invoice in their account after two days.

6.4 Deduction

The average cash-to-cash cycle time of Denau Farming is an indication that late payment received from buyers has a direct effect on their financial statements. The cash-to-cash cycle time can also serve as a key metric of management performance and true economic profitability. After the implementation of both of the proposed SCF models respectively the expected result is that the cash-to-cash cycle time of Denau Farming will decrease and thus that their EVA[®] will increase. The extent to which the cash-to-cash cycle time and EVA[®] will change is dependent on various factors.

Chapter 7: Case Study Discussion

7.1 Introduction

In Chapter 7 the case study that is applied on Denau Farming is explained. This chapter will give the reader an extensive elucidation of each process that from part of M4SC™, SCOR®, and the overview of Denau Farming's current business operations.

7.2 Current Operations

It is clear from the case study that the time it takes for Denau Farming to receive payment from the buyers is very long while the operating cost in the meanwhile is on-going. It takes on average 11 weeks to receive the final payment from Hars & Hagenbauer once a shipment is made. The final payment that is received is the invoice value minus the advance payment minus any levies added because of defects. It is also identified that the gap from the moment the preparation cost starts and the first income is received from table grape exports is very large. Most farms develop a need for financial assistance during this period for efficient working capital management. Denau Farming only develops a need for finance later in the transaction lifecycle when cash flow is required after goods have been shipped.

7.3 Business Plan Analysis

The Business Plan Analysis gives Denau Farming's management a good indication of their strategy to achieve their medium to long term goals. It is important to identify these strategies and goals since the implementation of one of the SCF models may require Denau Farming's management to change or revise some of their strategies to be successful and effective during the implementation.

Denau Farming has a clear vision and mission that states that they want to be a sustainable table grape export producer that delivers top quality grapes and have a competitive advantage over other players. To be able to have a competitive advantage they must have an advantage in reliability, responsiveness, agility, cost, or asset management. Both of the proposed SCF models will enable Denau Farming to have a competitive advantage in terms asset management, improving the cash-to-cash cycle time. In order to meet their physical growth plans Denau Farming will have to invest a large capital amount that will increase their cash flow demands. Approved Payables Finance and selling invoices on Aztec Exchange can improve and optimise Denau Farming's cash flow and working capital during this expansion period in terms of receiving payment earlier from buyers to relieve

short term cash flow problems. It is however important to evaluate other SCF options that will suite the expansion plans better.

7.4 Competitive Landscape Analysis

The Competitive Landscape Analysis enables Denau Farming to identify and focus on their strengths to improve weaknesses during the decision to implement SCF. The external forces that can possibly influence the implementation are also identified. The SWOT analysis should not be done only focusing on financial strengths, financial weaknesses, financial opportunities, and financial threats because all the factors that can potentially influence the implementation phase should be identified. Management should be open to grasp all opportunities to improve the business. The threats identified should be well managed and contingency plans should be developed in case a threat becomes viable.

There are various financial opportunities that can be turned into strengths by implementing SCF. These opportunities include receiving payment earlier from buyers, generate cash flow to pay obligations earlier and thus receiving a rebate, and to reduce the opportunity cost by receiving early payment. There are also potential threats that can turn into financial weakness. The Approved Payables Finances facilitated by a BPO and Aztec Money's SCF models enable suppliers to receive payment much earlier but also not receiving the full value of the invoice. This can be seen as a weakness and a potential threat to Denau Farming.

7.5 Supply Chain Strategy Analysis

Supply Chain Strategy Analysis shows Denau Farming exactly what their performance goals are compared to their competitors. Denau Farming is one of the most reliable suppliers of table grapes of excellent quality that are delivered at the right time and in the right condition. Parity is the performance goal of agility since the total grapes produced is mostly dependent on the farm size. Denau Farming's asset management is a lower-priority performance goal while cash-to-cash cycle time, return on fixed assets, and return on working capital are all components of asset management. If Approved Payables Finance or Aztec Money's SCF model is implemented into Denau Farming's business model the asset management performance goal is expected to move to advantage or even superiority, but at the cost of another performance attribute.

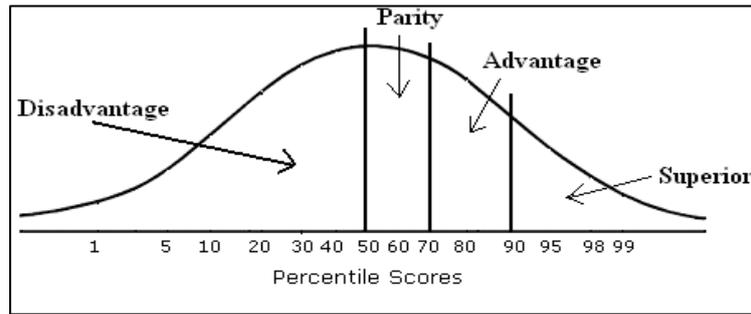


Figure 7.1: Supply Chain Strategy Analysis of Denau Farming.

Source: Supply Chain Council, 2014b.

Figure 7.1 indicates the Strategy Analysis in terms of their asset management. Denau Farming's asset management performance goal is currently to be in the 50th percentile, which means they want to be an average performer. After the implementation of either of the SCF models asset management performance is expected to move to the 70th percentile (to have an advantage) or even the 90th percentile (to be superior to competitors). The main concern is that asset management does not drop below the 50th percentile to have a competitive disadvantage.

7.6 Supply Chain Network Definition

Denau Farming has an effective supply chain network in place with internal and external coordination. The network is seen as effective since no node or major supply chain processes can be removed or changed without disrupting the physical and financial flow. The only change that is possible in Denau Farming's supply chain network is if ownership of transportation and shipping is taken over by them. Denau Farming's internal infrastructure is very efficient that is equipped with information technology, cool storage, packing facilities, and mechanical implements. The foundation of a good infrastructure and information technology capabilities makes it easier to implement SCF since their focus can be on the project alone and not on other priorities. Each of the major supply chain processes is well defined and accountability of each process has ownership.

7.7 Supply Chain Gap Analysis

During the Supply Chain Gap analysis the current cash-to-cash cycle time has been calculated to validate the problem of late payment received from buyers. The problem was firstly identified by observing the supply Chain of Denau Farming and by interviews with Fanie Naudé and Herman Louw. The cash-to-cash cycle time based on the five point rolling average was estimated at 114.89 days. This estimation can be translated into Denau Farming receives their first income 3.6 months after the moment that they have occurred input costs. This is identified as a gap due to the high

operational costs that transpire during the time in which Denau Farming waits for payment from buyers.

7.8 Network Organisational Analysis

Denau Farming's current network figuration is well established with a foundation of good management structures. There is not ample room for improvement regarding the reconfiguration of nodes and activities, since Denau Farming has reached maturity in this regard. The organisation or person responsible for each of these nodes and activities can however be reconfigured. The forwarding responsibility can be placed solely on Hoekstra Fruit Exporters to specialise in the efficient transportation and handling of containers.

Hoektra Fruit Exporters are currently handling Denau Farming's financial supply chain and the responsibility can rather be allocated to dedicated financial professionals. The downstream financial outflow towards the transportation and handling of containers and port expenses can be managed by Hoekstra Fruit Exporters but the upstream financial inflow from the sales of table grapes should be handled and managed by Denau Farming's bank that will be the focal organisation during the BPO or Aztec Money during the sales of invoices on Aztec Exchange.

The organisational hierarchical management structure is well established with all responsibilities clearly held accountable to the allocated representative. Denau Farming's management structure has good practices in place to keep the labour force happy but at the same time manage them to be as efficient as possible by rewarding exceptional work.

7.9 As-Is Supply Chain Process Definition

During the as-is process definition the current downstream flow of grapes and the related upstream financial flow is described. It is identified that Denau Farming is making use of internal finances to pay for all major supply chain processes. This is seen as inefficient because of the long time it takes to receive payment from buyers while the proposed SCF models will enable them to have the money owed by buyers in their accounts in two to five days. With earlier access to money owed to them they will be able to pay creditors earlier to receive a rebate. It has also been identified that Denau Farming receives an advance payment from Hars & Hagenbauer to pay for the first shipment and to release tied up capital in the Supply Chain.

7.10 Process Performance Analysis

The root causes identified for receiving late payment from buyers is twofold. Firstly the time it takes to transport the grapes from the farm to the buyer takes on average 29 days as identified in section 3.10. The second root cause identified is the delayed processing time of paper-based documentation of quality checks and shipping documents.

7.11 Process Solution Definition

Two proposed SCF models were chosen based on the demand of Denau Farming to obtain financing late in the transaction lifecycle. The demand was developed by the long period that Denau Farming waits to be paid for grapes exported from the moment the grapes leaves the farm. The two solutions that were chosen and defined are: Approved Payables Finance facilitated by a BPO and Aztec Money's receivables finance. The reason the two SCF models were chosen is because a need exist to overcome the long period in which Denau Farming receives payment from buyers and both these models do exactly that.

7.12 To-Be Process Definition

The two SCF models are very similar in practice and are based on the more traditional factoring model. Approved Payables Finance is also known as reverse factoring where Denau Farming sells their receivables to the bank receiving cash at a discounted rate in about 5-6 days. The BPO is only security for Denau Farming to get paid by the buyer to prevent default from occurring. The BPO also automates all the documentation required by Denau Farming's bank and Hars & Hagenbauer's bank through the TMA.

Selling invoices on Aztec Exchange is also very similar to Approved Payables Finance the only difference is the source of finance. Here the invoice is sold in an auction on the Aztec Exchange market and the highest bid claims ownership of Denau Farming's receivables. Denau Farming is able to get the funds transferred into their account between 2-5 working days.

7.13 Process Change Portfolio Analysis

After the implementation of either of the SCF models Denau Farming's asset management performance goal would shift from parity to advantage or superiority. The cash-to-cash cycle time is only one of the metrics to improve asset management but can prove to be very valuable. The advantages of having a competitive advantage in terms of cash-to-cash cycle time can be translated

into higher Economic Value Added based on research of Bolek *et al.*, (2012) on the relationship between cash-to-cash cycle time and EVA[®].

7.14 Technology Assessment

An advantage of making use of either of the models is that no additional expensive investment in technology or platforms is required. During the Approved Payables Finance facilitated by the BPO option the bank pays an annual fee for the Transaction Matching Application. Aztec Money has an existing online platform that requires no additional investment in platforms or technology.

7.15 Advantages and Disadvantages of BPO and Aztec Money

One of the advantages of BPO over Aztec Money is that the BPO can be created at any time during the lifecycle of a transaction and for an amount that can differ from the total value of goods sold. Aztec Money on the other hand is restricted to financing of the invoice value of the goods sold.

Another advantage that BPO has over Aztec Money is that with BPO Denau Farming can make use of alternative forms of financing throughout the transaction lifecycle that can result in lower financing costs, and lower confirmation costs. Hars & Hagenbauer can also benefit from dynamic discounting because BPO allows for early payment.

A disadvantage of using Approved Payables Finance facilitated by a BPO is that only a fair number of banks have adapted it. This makes it difficult for Denau Farming to find a bank that is able to provide the related services. It also makes it difficult for banks to have a sustainable customer base that will justify the investment in the TMA.

A disadvantage of using the BPO is that the TMA scheme is limited to banks only. This restricts Denau Farming to only make use of a bank to finance them and not the ability to make use of other financial service providers. Also the BPO is a new instrument and not all banks have the capability and functionality to support it.

One of the definite advantages of using Aztec Money is that it is a much easier source of finance than BPO. Aztec Money requires no investment in information technology like the TMA scheme or any subscription fees. Denau Farming does not need their bank or Hars & Hagenbauer's bank to get on board with the program.

Both Aztec Money and the BPO optimise the working capital of Denau Farming and thus improve their liquidity and cash flow. The key in improving working capital lies in the management of account

receivables (debtors) while the BPO also provide the opportunity to make use of flexible external financing as demand during the transaction lifecycle.

The BPO provide Denau Farming the absolute assurance that they will be paid on time according to the agreed payment terms. The absolute assurance that Denau Farming will receive payment from buyers strengthens their relationship and allows negotiating improved terms and conditions.

The BPO reduces the risk of discrepancies by eliminating manual checking and analysis of documentation. The BPO makes the whole documentation presentation and checking automated by implementing the TMA and reducing the chances of inaccurate documentation, and thus reduces the chance of delayed payment.

Another advantage of using Aztec Exchange to finance receivables is that once the invoice is loaded onto the Aztec Exchange market to be sold and the transaction is unsuccessful, no fees are charged to Denau Farming.

An advantage of using Aztec Exchange is that Denau Farming controls the sales terms. They have the option to choose the percentage of the invoice value they want to receive immediately (2-5 working days). The disadvantage of Denau Farming being able to choose their own sales terms is that it is expensive, the maximum transaction fee they charge is 2% of the invoice value and a minimum of 1% discount rate on the invoice value per 30 days. Using Aztec Exchange to finance Denau Farming would typically receive between 85% and 90% of their invoice value.

Approved Payables Finance is also expensive if it is facilitated by a bank. The average fees that banks charge range from 10% to 15% on the invoice value. This translates in the same total value that can be expected on the invoice value by making use of Aztec Exchange.

It is important to keep in mind that the total value that Denau Farming can receive by making use of Approved Payables Finance is dependent on various factors. These factors include the bank providing the finance, value of the invoice, discount structure, the contract itself and other criteria.

Chapter 8: Conclusions and Recommendations

8.1 Introduction

Chapter 8 explains the conclusions and recommendations that were made from the research. Areas in which there are room for additional research are also identified vis-à-vis the near future. It is derived from the conclusions that SCF is still in its early stages of research in the table grape industry.

8.2 Conclusions

The concern for table grape producers regarding the working capital constraints due to late payment received from buyers during the export of table grapes was the catalyst for the research. The aim of the research was to conduct an exploratory case study on Denau Farming to identify possible SCF solutions to resolve inadequate working capital and generate cash flow for table grape producers during exports. A concept model was created to implement the proposed SCF models into Denau Farming's business model by identifying the table grape producer's strategy, identifying gaps in the supply chain by calculating the cash-to-cash cycle time, proposing a solution to the gap, and identifying the to-be processes after the implementation of the solution. The outcome of the study was then to identify the expected effect the SCF models will have on cash-to-cash cycle time and EVA®.

Secondary research was conducted to complete the literature review of the study. The literature review started by explaining the concept SCF. The advantages and limitations regarding SCF were also discussed. The different SCF models available as cash generating solutions formed part of the research and resulted in the two SCF models investigated. The average working capital requirements for table grape producers were calculated and it was found that on average table grape producer will need R11 388 000 to finance their own exports during the harvest/export season and not all table grape producers has the financial capacity to meet this requirement. The financing needs for table grape producers are explained in detail to get an understanding of the type of SCF model that are demanded. Observations were made using a technique called, "stapling yourself to an order" which entailed following the grapes from the farm to the port. Observations were made on the farm, in the pack houses and cold stores, and in the Container Terminal of the Port of Cape Town to gather information on the average time each major process takes. This lead to the conclusion that it takes

on average 29 days from the moment the grapes have been picked to reach the port of destination and contributed to the delayed payment received from buyers. The literature review ended with a discussion on the relationship between the cash-to-cash cycle time and EVA[®]. Bolek *et al.*, (2012) found that there is a direct relationship between cash-to-cash cycle time and EVA[®] and his research is used to determine the expected effect the two SCF models have on cash-to-cash cycle time and ultimately EVA[®].

Various semi-structured interviews were performed to gather quantitative and qualitative data in order to conduct an explorative case study on Denau Farming. Firstly Denau Farming's physical supply chain is explained with the corresponding financial supply chain. It is found that Denau Farming is paying for all supply chain processes with internal funds and the only tied up capital that is released in the supply chain is by receiving an advance payment from Hars & Hagenbauer to free up tied capital in the supply chain and that only covers the first shipment of the season. It is also found that Denau Farming is waiting 11 weeks to receive their final payment from Hars & Hagenbauer.

The concept model was completed in order to simulate the two proposed SCF models into Denau Farming's business model. The goal was to determine how the cash-to-cash cycle time are impacted and how their physical as well as financial supply chain would change after the proposed models are implemented and to identify resource changes. The data and information that were gathered to complete the concept model are divided into four layers. The strategy layer explained that Denau Farming is striving to be a sustainable table grape producer with future plans to expand farm size and their strategy is to be superior to their competitors in terms of reliability. The supply chain gap is also identified by using the cash-to-cash cycle time as a key performance indicator. The network layer identified key roles and accountability of major supply chain processes and activities. The process layer defined the as-is supply chain processes, identified the root causes for the gap in the supply chain, defined the proposed solution, and identified the to-be supply chain processes.

The first model that is proposed to implement is the International Chamber of Commerce (2013) BPO with Approved Payables Finance. The BPO facilitates a Transaction Matching Application scheme to communicate all data sets between Denau Farming's bank and Hars & Hagenbauer's bank. Denau Farming's bank uses receivables from Hars & Hagenbauer as collateral to finance Denau Farming to improve cash flow and reduce the time to receive payment for goods exported. Hars & Hagenbauer is able to pay Denau Farming's bank on the original date.

The second proposed model is Aztec Money's invoice financing platform. Aztec Money has created a platform called Aztec Exchange where suppliers can sell their invoices to receive immediate cash for their receivables. The platform enables bidders with the highest bid to buy the invoice. Denau

Farming is able to control their sale terms to be able to receive the required amount immediately and the remaining amount on the day that transaction is settled. Hars & Hagenbauer is also able to repay Aztec Money on the original day agreed upon.

In terms of the two SCF models there are various factors that will impact the decision on which model to implement. The BPO with Approved Payables Finance is a solution to improve documentation processing time and increasing the time in which payment is received from Hars & Hagenbauer. The main advantages of using this model include:

- The BPO automates all the documentation with the TMA scheme reducing mistakes that result into delayed financial flow.
- Able to provide finance on different time frames during the transaction lifecycle.
- The BPO enables absolute certainty of being paid for goods exported.

Selling invoices on the Aztec Exchange market is a solution to receive immediate cash for accounts receivable to improve working capital to meet obligations. The main advantages of using this model include:

- The seller of the invoice can control their own sale terms.
- It is a much easier source of finance than most other SCF models.
- Can take as little as three days to have money in account from the time the invoice is sold on Aztec Exchange.

What makes both these models unique from traditional lending is that the buyer's credit rating is evaluated rather than Denau Farming's credit rating. International buyers of fresh fruit consist usually of large multinational companies, like Hars & Hagenbauer, that has a good credit rating. Also both the models will increase the time in which Denau Farming will receive final payment for goods from 11 weeks to between two to five days. There is a trade-off between receiving early payment at about 80% of the invoice value and thus optimising working capital and receiving late payment at the full invoice value and potentially jeopardising working capital.

It was found that Denau Farming's cash-to-cash cycle time during current operations is on average 114.89 days which means it takes 115 days to receive the first income from the moment that input costs occur. Both the Approved Payables Finance through a BPO and selling invoices on Aztec Exchange are proposed to shorten the cash-to-cash cycle time and improving Denau Farming's EVA[®]. Both the SCF models are expected to increase Denau Farming's EVA[®] by reducing the cash-to-cash cycle time and thus reducing working capital and increasing the EVA[®]. Using the EVA[®] model it is found that a 2% decrease in working capital will result in a 0.52% increase in EVA[®], which led to the

final conclusion that Denau Farming's EVA[®] is not extremely sensitive to a change in working capital but if the cash-to-cash cycle time is reduced, as expected, after the implementation of the Approved Payables Finance facilitated by a BPO and selling invoices on Aztec Exchange respectively the EVA[®] of Denau Farming will increase.

8.3 Recommendations

Both of the SCF models are innovative solutions to improve cash flow by reducing the time exporters wait for payment from buyers. Approved Payables Finance through a BPO is yet to prove its effectiveness since it is a fairly new model. I would recommend that Denau Farming consults and examines the International Chamber of Commerce's ICC Guide to the Uniform Rules for BPOs (2013) before deciding to implement the Approved Payables Finance through a BPO. Denau Farming should consult Devine (2014) before deciding to make use of Aztec Money to sell their invoices on the Aztec Exchange market. Aztec Money is not registered as a financial advising company but Devine (2014) can give Denau Farming guidance on the value and terms of sale when selling invoices on the Aztec Exchange market.

Only two out of various existing SCF models are proposed to improve cash-to-cash cycle time, and it is strongly recommended that Denau Farming considers some of the other models that might possibly improve their EVA[®] by a larger extent. SCF is yet to reach maturity and new innovative models are developed each year.

The concept model is only a SCF implementation framework adapted from the Supply Chain Council (2014a) M4SC[™] framework and should be seen as a guideline to improve the supply chain. The concept model is a framework in which:

- a company's business strategy is analysed
- gaps in the supply chain is identified by using SCOR[®] metrics
- accountability and responsibility is identified
- SCF model(s) is proposed to solve existing problem
- Identify the as-is supply chain
- Identify the to-be supply chain after the implementation of the SCF model(s)
- Identify resource changes after implementation

During the research the supply chain network is seen as efficient after observations were made and after conducting interviews with various supply chain stakeholders. If the concept model is used in the future companies should review the Supply Chain Council (2014) M4SC[™] Network Layer to

determine if the as-is network configuration is efficient or whether nodes and activities can be added, changed or eliminated from the supply chain.

It is recommended that additional research is done on the financial supply chains of the fresh fruit export industry in South Africa. The fresh fruit export industry has a significant influence on South Africa's economy in both the value contribution to GDP and job creation. It is recommended that banks and financial service providers work more closely together to continue to improve the services and solutions provided to generate cash flow by releasing tied up capital in the supply chain.

8.4 Areas for Additional Research

After the completion of the research there were areas identified for future research. The research did not include the analysis of the effects on the financial statements after the SCF solutions were implemented. In future research the effects after the SCF solutions are implemented into the table grape supply chains can be analysed to make more quantified conclusions on financial implications.

In order to make these conclusions the SCF solutions should be implemented into the various supply chains with the help of finance and supply chain professionals. Once this is done it can be established if the claimed advantages in existing literature of SCF create a win-win-win situation for the buyers, suppliers, and financial institutions.

There is also room to establish benchmarking standards for SCF solutions in the table grape export supply chains. To establish benchmarks typically more than 30 different supply chains should typically form part of the scope of the research. Benchmarks should include the total average decrease in working capital requirement of different solutions, total average cash-to-cash cycle time decrease of different solutions, and the net effect on return on investment for each of the SCF solutions. To establish these benchmarks and see the effect on return on investment, different table grape supply chains can make use of business simulation software called The Cool Connection. The Cool Connection enables a business to make decisions based on sales, purchasing, finance, and supply chain with the focus on implementing a SCF solution.

The Supply Chain Strategy Analysis percentiles can be used to place the relative advantage competitors have over each other. The table grape farms that form part of the scope can either be ranked below the 50th percentile (disadvantage), 50th percentile (parity), 70th percentile (advantage), or 90th percentile (superiority).

Key performance indicators should be identified to measure the financial performance of supply chains to determine whether or not to implement SCF into the current business structure. This will

enable benchmarks for certain KPI's to identify "laggers" and "leaders" to measure performance against. It will also be advisable to do a risk-return analysis to identify the possible risk as well as the possible return for implementing a specific SCF solution.

Fresh fruit exports contributes to job creation and has a huge contribution to the GDP of South Africa. There is a need for new SCF solutions in the agricultural sector, specifically fresh fruit export supply chains that does not have semi-finished stock. An area for future research is the development of agricultural specific SCF solutions for fresh fruit exports.

The European Cooperation in Science and Technology (COST) is currently working on a project, the SCF Network, to develop new SCF models, develop standard terminology, develop new theory and improve existing theory, and develop handbook guidelines and best practices. After the completion of the project a lot of uncertainties will be resolved and more knowledge will be provided to stakeholders to improve SCF, but the project is estimated to be completed in 2016.

The focus of the research was on the export side of the table grape supply chains to improve cash flow. A need for SCF may develop during the preparation or production phase for table grape farms. Further research can be done on trigger points earlier in the transaction life cycle of table grape supply chains to determine the effect it will have on the farms' financial statements, in particular the cash flow improvements.

The technological development in SCF over the last couple of years has seen great improvement. Various niche markets have been fulfilled by these service providers. In future research all the available SCF technology platforms and service providers can be identified to give stakeholders a variety of options to choose from.

In future research the time frame in which the cash-to-cash cycle time is calculated should be considered. It is proposed that the cash-to-cash cycle time should be calculated during the harvest season or just after the harvest season to catch the direct effect of late payment on financial statements.

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Appendix A

Interviews:

During the interviews triangulation is used to validate the information provided by one party with information provided by another party but from different perspectives.

A1 Freshvest Capital (Pty) Ltd

Freshvest Capital (Pty) Ltd. was established in 2008 to provide financial solutions to create value in the export and agricultural industries. Their services include providing financing and foreign exchange hedging services to organisations. Freshvest Capital (Pty) Ltd. acts as an intermediary and advisor that provide products and services for managing foreign currency exposures and hedging instruments for corporates.

Interviewees: FC Eloff, Financial Director

Wouter Viljoen, Financial Manager

The reason behind choosing to interview Freshvest is because they have expertise in fresh fruit exports and the different financing instruments available to finance exports. The main goal was to gain an understanding of the need that table grape producers develop for financing during exports and the type of financing typically to be obtained. An understanding of the different parties that are accountable during the transaction lifecycle was gained. The credit rating system of third party financial service providers was also examined.

A2 Absa AgriBusiness

Absa AgriBusiness is a division of Absa Group Limited that provides various specialised agricultural financial offerings. These offerings include expanding farming operations, gain access to working capital, insurance coverage, cash flow management

Interviewee: Adri Esterhuyse, Senior Agri-specialist

During the interview with Absa AgriBusiness the early finance needs during the transaction lifecycle was explored. The focus during the interview was based pre-shipment finance of working capital requirements. The different factors that banks look at during credit rating were also examined.

A3 Fruit Route

Fruit Route is a fresh fruit export organisation for the Du Toit Group (Pty) Limited

Interviewee: Andries Greyling, Managing Director

The interview emphasised all the processes after the goods have been shipped. The Incoterms® that usually are negotiated during table grape exports are investigated. The two different tariffs that apply during the exports are explained and when the farmer receives the advance from buyers. The total time it takes to receive final payment from the buyer is explained in detail. The total upstream financial flow of the table grape export supply chain is investigated.

A4 Hoekstra Fruit Exporters

Hoekstra Fruit Exporters is accountable for the export and logistical services of Denau Farming's table grapes and citrus fruit. Denau Farming is a shareholder of Hoekstra Fruit Exporters.

Interviewee: Herman Louw, Managing Director

During the interview the total working capital requirement of table grape farmers is explained with practical examples as well as the income difference of financing exports internally versus making use of external financing. All the documentation that are catalysts for financial flow are explained and copies of Denau Farming's documents are provided. The total time it takes for each major supply chain process is validated with the corresponding financial flow. Denau Farming's market structure is investigated and the structure of Hars & Hagenbauer and Tesco is explained. Some of the problems of factoring as a financial solution is during table grape exports are explained.

A5 Denau Farming (Pty) Limited

Interviewee: Fanie Naudé, Managing Director

Various interviews are held with Fanie Naudé for the duration of the research. All the relevant information and data regarding the completion of the case study and Concept Model is extracted during these interviews. The information gained during the first interviews was the problem of late

payment by received by buyer experienced at Denau Farming. The second set of interviews was to complete the M4SC™ required information and data fields. This data and information include the explanation of the current as-is operations and processes as well as the business plan analysis. The financial statements of Denau Farming are obtained during the interview to contribute to quantitative data.

A6 Vallei Sekretariele Dienste & Geoktrooieerde Rekenmeesters

Provide financial services to fresh fruit farmers.

Interviewee: Erasmus Van Zyl, Management Accountant

During the interview, in which Fanie Naudé was present, the traditional solutions towards working capital requirements for table grape producers were discussed. The time frame in which the documentation and financial flow corresponds is explained in detail. The financial flow and the accountability as well as the Incoterms® are explained. The reasons why CIF and FOB is chosen the majority of the time is made clear.

A7 Aztec Money

Provides export trade finance that the supplier controls by trading export trade receivables and invoices with immediate access to cash on the suppliers terms.

Interviewee: Colm Devine, Business Development Vice President

During the interview the services that Aztec Money provide for fruit exporters is explained. The product is defined and the to-be processes after implementation are explained, with reference to Denau Farming. The advantages that Aztec Money has for Denau Farming is identified and the effect on their cash-to-cash cycle time and EVA is explained. The resources change requirements is identified after implementation. The difference between Aztec Money and making use of SCF through banks is explained.

A8 Involvation Interactive BV

Involvation Interactive BV is the creator of a cross functional business simulation game called The Cool Connection. The aim of the game is to bridge the physical and financial supply chains by learning SCF and Supply Chain Management. They provide webinars, e-learning, and training to align different departments, aligning strategy and execution, and alignment of supply chain partners.

Interviewee: Turner Tian, Business Development Manager

The interview was a conversation via e-mail to explain the correlation between SCF and Incoterms®. It was explained that both the type of Incoterms® and payment terms will determine on what stage the ownership will be carried over as well as when the account payable will be registered on the buyer's balance sheet.

A9

Semi-Structured Interview Questionnaire

Before each interview the author briefly explained what the research is about to give the interviewee background on what answers is expected and to create a conversational atmosphere. The author then asked the interviewee to briefly state what it is they are doing at their organisation.

1. What is the main reason that fresh fruit producers need external finance?
2. What commodity requires financial services on the largest scale?
3. Do large scale producers or smaller scale producers require financing more often?
4. On what stadium does the producer require financing? Preseason? Harvest season? During Exports?
5. What activity/document(s) instigate the start of the upstream financial flow?
6. What advantages does financial assistance have for producers?
7. What type of financial instrument is the most popular? Why?
8. What are the requirements to gain access to finance?
9. Please explain how each of your financing methods work?
10. On what ground does producers get approved or disapproved for financial assistance?
11. What is the trade agreements used the most of the time during fresh fruit exports?
12. How long does it take for the producer to get paid after the goods have been shipped?
13. How do you get reimbursed after the goods have been delivered?
14. What would the best financial solution be to receive payment from the client to the producer earlier during exports? Why?
15. What is the impact on the producers financial statements in particular the cash-to-cash cycle time?
16. How will this solution change the current operations of the producer?
17. What resource changes are required after the implementation of the solution?

*The term finance/financial assistance/financial instrument are used because not all interviewees are familiar with the term Supply Chain Finance.

Appendix B

Appendix B identifies logistical export documents of Denau Farming.

B1

Printed by QX 18/03/2014 09:23:56		SUPER FRUIT		*agent*									
		Hoekstra Fruit Exporters											
PO Number : DDN00712		PACKING LIST											
From : Hoekstra Fruit Exporters PO Box 7178 Paarl North 7623 Tel : +27 21 869 8567 Fax : +27 21 869 8568		To : Anton Dürbeck GmbH Hessenring 120 61348 Bad Hamburg v.d.H., Germany E-Mail : mathias@duerbeck.com Tel : +49 617 2680 6111 Fax : +49 617 2680 6600											
Vessel : MOL CULLINAN		ETD : 17/03/2014		P.O.L.: CAPE TOWN									
Shipping Line : DAL		ETA : 04/04/2014		P.O.D.: ROTTERDAM									
Voyage No : 142B		Inv To :		Sale ID: 6103									
		Temp Serial No :											
Com	Var	Grade	Pack	Count	Inv	Mark	Farm	T/Market	Container No	Pallets	Boxes	Weight	Pallet ID
GR	BNH	1	127H	XL	PC	SUP	H0237	WS	DAYU6713882	1.0	170	4.5	160091600125030352
GR	BNH	1	127H	XL	PC	SUP	H0237	WS	DAYU6713882	1.0	170	4.5	160091600125030796
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031373
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031380
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031397
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031403
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031410
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031434
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031441
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031496
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031502
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031519
GR	BNH	1	127H	XL	PC	SUP	H0239	WS	DAYU6713882	1.0	170	4.5	160091600125031618
GR	BNH	1	127H	XL	PC	SUP	H0240	WS	DAYU6713882	1.0	170	4.5	160091600125031892
GR	BNH	1	127H	XL	PC	SUP	H0240	WS	DAYU6713882	1.0	170	4.5	160091600125031915
GR	BNH	1	127H	XL	PC	SUP	H0240	WS	DAYU6713882	1.0	170	4.5	160091600125031939
GR	BNH	1	B04H	L	PC	SUN	H0237	EU	DAYU6713882	1.0	180	4.5	160091600125030499
GR	BNH	1	B04H	L	PC	SUN	H0237	EU	DAYU6713882	1.0	180	4.5	160091600125030505
GR	BNH	1	B04H	L	PC	SUN	H0240	EU	DAYU6713882	1.0	180	4.5	160091600125031731
GR	BNH	1	B04H	L	PC	SUN	H0240	EU	DAYU6713882	1.0	180	4.5	160091600125031748
Total										20	3440		
PACKING LIST - SUMMARY													
Com	Vari	Pack	Grade	Count	Inv	Mark	T/Market	Container No	Pallets	Boxes	Weight/KG		
GR	BNH	127H	1	XL	PC	SUP	WS	DAYU6713882	16.0	2720	12240		
GR	BNH	B04H	1	L	PC	SUN	EU	DAYU6713882	4.0	720	3240		
TOTAL									20	3440	15480		

B2

	Hoekstra Fruit Exporters A.P.E. DECLARATION INVOICE		PO Box 7178 Paarl North 7623 Tel: +27 21 869 8567 Fax: +27 21 869 8568 VAT No : 4310221710																																														
	DATE: 17/03/2014	INVOICE NUMBER: HK-5926																																															
Anton Dürbeck GmbH Hessenring 120 61348 Bad Hamburg v.d.H. Germany		TEL : +49 617 2680 6111 FAX : +49 617 2680 6600 EMAIL : mathias@duerbeck.com		PO No:DDN00712																																													
INFORMATION:																																																	
Vessel : MOL CULLINAN Voyage No. : 142B Shipping Line : DAL POL : CAPE TOWN		Customs Authorisation No: 20408379 UCR No: 4ZA204083795926 ETD : 17/03/2014 ETA : 04/04/2014																																															
<table border="1"> <thead> <tr> <th>Cartons</th> <th>Pallets</th> <th>Commodity</th> <th>Variety</th> <th>Brand</th> <th>Count</th> <th>Container No</th> <th>Unit Price</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>720</td> <td>4</td> <td>GR</td> <td>BNH</td> <td>SUN</td> <td>L</td> <td>DAYU6713882</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>2720</td> <td>16</td> <td>GR</td> <td>BNH</td> <td>SUP</td> <td>XL</td> <td>DAYU6713882</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td colspan="8"></td> <td style="border-top: 1px solid black;">0.00</td> </tr> <tr> <td colspan="8">TOTAL DUE</td> <td style="border-top: 1px solid black;">0.00</td> </tr> </tbody> </table>	Cartons	Pallets	Commodity	Variety	Brand	Count	Container No	Unit Price	Price	720	4	GR	BNH	SUN	L	DAYU6713882	0.00	0.00	2720	16	GR	BNH	SUP	XL	DAYU6713882	0.00	0.00									0.00	TOTAL DUE								0.00				
Cartons	Pallets	Commodity	Variety	Brand	Count	Container No	Unit Price	Price																																									
720	4	GR	BNH	SUN	L	DAYU6713882	0.00	0.00																																									
2720	16	GR	BNH	SUP	XL	DAYU6713882	0.00	0.00																																									
								0.00																																									
TOTAL DUE								0.00																																									
Banking Details: Bank Name: Standard Bank of South Africa Ltd Paarl Branch, 45 Lady Grey Street, Paarl Bank Branch Code: 050210 USD CFC Acc No: 090418760 EUR CFC Acc No: 090418778 GBP CFC Acc No: 090418786 Bank Swift Code: SBZAZAJJICM		Declaration: "The Exporter of the products covered by this document (Customs Authorisation No: 20408379) declares that, except where otherwise clearly indicated, these products are of South African preferential origin"																																															
		Dated: 17/03/2014		Signature: A.H. LOUW																																													

B3

	Hoekstra Fruit Exporters		PO Box 7178 Paarl North 7623				
	COMMERCIAL INVOICE		Tel: +27 21 869 8567 Fax: +27 21 869 8568 VAT No : 4310221710				
DATE:	17/03/2014	INVOICE NUMBER:	5926				
Anton Dürbeck GmbH Hessenring 120 61348 Bad Hamburg v.d.H. Germany			TEL : +49 617 2680 6111 FAX : +49 617 2680 6600 EMAIL : mathias@duerbeck.c				
INFORMATION:							
Vessel : MOL CULLINAN		UCR No: 4ZA204083795926					
Voyage No. : 142B		ETD : 17/03/2014					
Shipping Line DAL		POL : CAPE TOWN					
Cartons	Pallets	Commodity	Variety	Brand	Size/Count	Container No	ZAR Price
720	4	GR	BNH	SUN	L	DAYU6713882	30.00
2720	16	GR	BNH	SUP	XL	DAYU6713882	30.00
3440		20					103,200.00
TOTAL DUE							R 103,200.00
Banking Details:				Declaration:			
Bank Name: Standard Bank of South Africa Ltd Paarl Branch, 45 Lady Grey Street, Paarl				"The Exporter of the products covered by this document (Customs Authorisation No: 20408379) declares that, except where otherwise clearly indicated, these products are of South African preferential origin"			
Bank Branch Code: 050210							
ZAR Acc No: 07 221 4252							
				Dated: 17/03/2014		Signature: A.H. LOUW	

B4

		HOEKSTRA FRUIT EXPORTERS (PTY) LTD ADVANCE PRICE INVOICE Reg No 2005/000426/07			Invoice ID: 5926			
		VAT Reg No.: 4310221710 TEL +27 21 869 8567 FAX +27 21 869 8568 MOBILE +27 83 321 2755		PO Box 7178 Paarl North 7623				
CLIENT: Anton Dürbeck GmbH Hessenring 120 61348 Bad Hamburg v.d.H. Germany,		UCR No : 4ZA204083795928 PO No : DDN00712 Vessel : MOL CULLINAN Date : 17/03/2014						
Commodity	Variety	Pack Code	Count	Quantity	Cartons Per Pallet	Total Cartons	Rate	Amount
Grapes	Bonheur	127H	XL	16	170	2720		
Grapes	Bonheur	B04H	L	4	180	720		
				20		3,440		
							Subtotal	
							Vat @ 14%	0.00
							TOTAL	
Payment Terms								
Advance due 7 days from receipt.								
Banking Details								
		Standard Bank of South Africa Ltd						
		Paarl Branch, 45 Lady Grey Street, Paarl						
Bank Code	050210							
EUR CFC Acc No	090418778							
Bank Swift Code	SBZAZAJJICM							

B5

ANTON DÜRBECK		gmbh									
<p>ANTON DÜRBECK GmbH Hessenring 120 DE - 61348 Bad Honberg v.d.H. HDEKSTRA FRUIT EXPORTERS (PTY) LTD , HEXRIVER PO Box 7178 Paarl North 7823 Südafrika</p>											
ACCOUNT SALE											
Page:		1									
Document Date:	09.05.14										
Master Batch No.:	1400541										
Voyage No.:	1414039										
Vessel departed:	MOL CULLINAN										
Vessel arrived:	MOL CULLINAN										
Mode of transport:	C.I.F.										
Departure date:	17.03.14										
Arrival Date:	03.04.14										
Port:	Rotterdam										
Creditor's no.:	614377										
Your VAT No.:											
Our VAT No.:	DE 114118807										
Result											
Batch	Product Brand	Variety Size	Orige Cat Color	Unit	Quantity	Price	Total Value				
14001874	Grapes SUNSHINE	Bonheur L	ZA	I	Kollo 4,5kg Poly duty paid		720				
14001875	Grapes SUPERGRAPE	Bonheur XL	ZA	I	Kollo 4,5kg Poly duty paid		2.720				
Total Result							3.440				
Costs							Total				
Forwarding							97,80				
Terminal Handling Charge							270,00				
Coolstorage							260,00				
Merchant haulage R'dam - de Meern							309,75				
Costs for Survey Report							85,00				
Laboratory Costs							390,00				
Total costs							1.412,55				
Commission 7%							2.273,71				
Total Result EUR											
CONTAINER LIST: DAYU 671388-2											
<p>Es gelten unsere allgemeinen Geschäftsbedingungen.</p> <table border="0"> <tr> <td>ANTON DÜRBECK GmbH Geschäftsführer Karl Dürbeck, Matthias Dürbeck Telefon (0 61 72) 68 06-0 Telefax (0 61 72) 68 06-800 E-Mail: anton@duerbeck.com</td> <td>Reg. No.: 002840190 VAT Reg. No.: DE 114118807 Anlagenort: Frankfurt HRB: 2762</td> <td>Commerzbank AG BSB: 50050000 Acc.: 420730000 IBAN: DE00500500000420730000 Swift: DRESDEFF</td> <td>HypoVereinsbank AG BSB: 80320191 Acc.: 8404610 IBAN: DE5050320191000840610 Swift: HYVEDEMM30</td> </tr> </table>								ANTON DÜRBECK GmbH Geschäftsführer Karl Dürbeck, Matthias Dürbeck Telefon (0 61 72) 68 06-0 Telefax (0 61 72) 68 06-800 E-Mail: anton@duerbeck.com	Reg. No.: 002840190 VAT Reg. No.: DE 114118807 Anlagenort: Frankfurt HRB: 2762	Commerzbank AG BSB: 50050000 Acc.: 420730000 IBAN: DE00500500000420730000 Swift: DRESDEFF	HypoVereinsbank AG BSB: 80320191 Acc.: 8404610 IBAN: DE5050320191000840610 Swift: HYVEDEMM30
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