Analysing the competitiveness performance

of the South African apple industry

by

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Declaration

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Dedication

I dedicate this masters thesis to my mother Funeka Jafta, who has been my constant source of inspiration. She has given me the drive and discipline to tackle any task with enthusiasm and determination. Without her love and support this project would have not been a success.

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Abstract

The South African apple industry is influenced by a number of factors, including increased globalisation of markets, trade liberalisation, advances in information technology and consumer preferences. These factors have a continuous effect on the competitiveness of the industry and force producers and processors to position themselves as capable competitors in the global free-market environment. This study measures and analyse the competitiveness of the South African apple industry, including some aspects in the value chain, in an attempt to address the following research question: What is the global competitive advantage of the South African apple industry relative to its competitors.

To adequately address this research question, a five-step methodology was used to direct the study: The first step was to define competitiveness in the apple industry. Due to the diversity of definitions of competitiveness as a concept, this study adopted the following working definition based on how Esterhuizen, 2006; Freebairn, 1986 define competitiveness. In their view competitiveness is defined as the ability of an industry (apple industry) to trade its products successfully in order to achieve sustainable business growth within the global environment, while earning at least the opportunity cost of returns on resources employed" This definition is accepted in this study because it is noted that competitiveness is most often associated with trade performance. With the above in mind, and in view of the importance of open global apple trade, competitive performance in the South African apple industry is strongly linked to trade performance.

The second step was to measure competitive performance based on the accepted definition. Data from the Food and Agricultural Organisation of the United Nations and Trade Map was used to examine the competitiveness of the industry. Three internationally recognised indexes were used to calculate the comparative and competitive advantages of the apple industry in South Africa, namely the Revealed Comparative Advantage (RCA#) index, the Net Export index (NXi), and the Relative Revealed Comparative Trade Advantage (RTA) index.

The results show that South Africa's apple industry has sustained a competitive advantage, with most of the recent RCA# and RTA index values moving towards 10. When compared with its competitors, Chile and New Zealand show a strong competitive performance, with RTA index values above 10. However, South Africa has a relatively better global competitive advantage over Italy, Argentina, France, Poland, China and the United States of America and are sustaining a

third position on the "international apple podium". Netherlands and Brazil are internationally uncompetitive in the production of apples

In step 3 the Apple Executive Survey (AES) was used to identify the factors that constrain and enhance the competitiveness of the South Africa apple industry so that the industry can improve on those factors that constrain competitiveness in order to improve its competitive performance status. The most important factors that were found to have a negative impact on the competitiveness of the South African apple industry were quality of low-skilled labour, cost of crime, availability of skilled labour, SA labour policy, the cost of infrastructure, trust in the political system, administrative regulations, health-related issues (HIV/Aids), the cost of capital and land reform policy. The findings indicate that much needs to be done in these focus areas to boost the competitiveness of the industry in the international market.

Factors that enhance the competitiveness of the industry were growth in the international market, the availability of unskilled labour, the availability of transport, competition in the domestic market, industry expenditure on research and development (R&D), the quality of infrastructure, the availability of storage facilities and South African (SA) competition policy. The industry needs to capitalise on these factors in order to improve its competitiveness.

In step 4 the Porter Model was then used to group these factors in to the main determinants for competitiveness to prepare the date for an strategic analyses in step 5 where recommendation were made on actions to enhance and rectify or mitigate some of the challenges that are faced by the apple industry in South Africa – these includes: skills training, development of alternative markets, improved cooperation between the apple industry and the government is necessary in supporting the apple industry through infrastructure development, R&D, globally aligned regulations and support to trade promotion.

Opsomming

Die Suid-Afrikaanse appelbedryf word deur 'n verskeidenheid van faktore beïnvloed, waaronder verhoogde globalisering van markte, liberalisering van handel, vooruitgang in inligtingstegnologie en verbruikersvoorkeure. Hierdie faktore het 'n deurlopende effek op die mededingendheid van die bedryf en dwing produsente en prosesseerders om hulleself as bekwame mededingers in die globale vryemarkomgewing te posisioneer. Hierdie studie meet en analiseer die mededingendheid van die Suid-Afrikaanse appelbedryf, insluitende aspekte van die waardeketting, in 'n poging om die volgende navorsingsvraag aan te spreek: Wat is die globale mededingende voordeel van die Suid-Afrikaanse appelbedryf teenoor dié van sy mededingers?

Om hierdie navorsingsvraag behoorlik aan te spreek, is 'n vyfstap-metodologie gebruik om hierdie studie te rig: Die eerste stap was om mededingendheid van die appelbedryf te definieer. As gevolg van die verskeidenheid van definisies van mededingendheid as 'n konsep, het hierdie studie die volgende bruikbare definisie aangeneem, wat gebaseer is op hoe Esterhuizen (2006) en Freebairn (1986) mededingendheid definieer. Hulle siening is dat mededingendheid die vermoë van 'n bedryf (die appelbedryf) is om suksesvol met sy produkte handel te dryf om sodoende onderhoubare besigheidsgroei binne die globale omgewing te behaal, terwyl dit ook ten minste die geleentheidskoste verdien van die opbrengs op hulpbronne gebruik. Hierdie definisie word in die studie aanvaar om beslag te gee aan die uitvoergeneigdheid van die appelbedryf en dat dit opgelet is dat mededingendheid in die bedryf sterk verband hou met handelsprestasie.

Die tweede stap was om die mededingende prestasie op grond van die aanvaarde definisie te meet. Data vanaf die Verenigde Nasies se *Food and Agricultural Organization(vanaf 1961)* en *Trade Map (vanaf 2001)* is gebruik om die mededingendheid van die bedryf te ondersoek. Drie internasionaal erkende indekse is gebruik om die vergelykende en mededingende voordele van die appelbedryf in Suid-Afrika te meet, naamlik die *Revealed Comparative Advantage* (RCA#) indeks, die Netto Uitvoer-indeks (*Net Export index (NXi)*), en die *Relative Revealed Comparative Trade Advantage* (RTA) indeks.

Die resultate toon dat Suid-Afrika se appelbedryf deurlopend 'n posetiewe mededingende voordeel het, met die meeste van die RCA#- en RTA-indekswaardes oor die afgelope dekade stygend na net onder die waarde van 10. In vergelyking met die land se mededingers toon Chili en Nieu-Seeland sterker mededingende prestasie, met RTA-indekswaardes bokant 10. Suid-Afrika het egter 'n relatief beter globale mededingende voordeel oor sy belangrikste

mededingers, naamlik Italië, Argentinië, Frankryk, Pole, China en die Verenigde State van Amerika en beklee n konstante derde plek op die "internasionale appel poduim". Nederland en Brasilië is internasionaal onmededingend in appelproduksie.

In stap drie is die *Apple Executive Survey* (AES) gebruik om die faktore te identifiseer wat die mededingendheid van die Suid-Afrikaanse appelbedryf strem of verhoog. Die belangrikste faktore wat gevind is om 'n negatiewe impak op die mededingendheid van die Suid-Afrikaanse appelbedryf te hê, was die kwaliteit van laag geskoolde arbeid, die koste van misdaad, die beskikbaarheid van geskoolde arbeid, SA arbeidswetgewing, infrastruktuurkoste, lae vertroue in die politieke stelsel, komplekse en tydrowende administratiewe regulasies, gesondheidsverwante kwessies (MIV/Vigs), die koste van kapitaal en sake wat verband hou met die grondhervormingsbeleid. Die bevindinge toon dat veel nog in hierdie fokusgebiede gedoen moet word om die mededingendheid van die bedryf in die internasionale mark te verhoog.

Faktore wat die mededingendheid van die bedryf verhoog, was groei in die internasionale mark, die beskikbaarheid van ongeskoolde arbeid, die beskikbaarheid van vervoer, mededingendheid in die binnelandse mark, besteding op navorsing en ontwikkeling, die kwaliteit van infrastruktuur, die beskikbaarheid van opbergfasiliteite en Suid-Afrikaanse (SA) mededingingsbeleid. Die bedryf moet op hierdie faktore kapitaliseer om sy mededingendheid te verbeter.

In stap vier is die Porter-model gebruik om hierdie faktore in die vernaamste determinante vir mededingendheid te groepeer om die raamwerk te stel vir 'n strategiese analise in stap 5, waar aanbevelings gemaak is oor optredes om sommige van die uitdagings wat die appelbedryf in Suid-Afrika in die gesig staar aan te pas, te verbeter en reg te stel. Hierdie sluit in verbeterde vaardigheidsopleiding veral in die laag geskoolde groepe, ontwikkeling van alternatiewe markte, en verbeterde samewerking tussen die appelbedryf en die regering, wat nodig is om vertroue te skep en die appelbedryf d.m.v. infrastruktuurontwikkeling, navorsing en ontwikkeling, globaal belynde regulasies en handelsbevording te ondersteun.

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CHAPTER 1: INTRODUCTION

1.1 Background

The South African agricultural food sector is experiencing a period of rapid structural adjustments: South Africa is fully part of the global food economy, and global and local consumer preferences are changing continuously, having an ever-changing impact on the industry, inter alia as a result of income developments, shifts in the population structure, food safety standards, tastes and food style changes, new lifestyles and technology, to name some of the factors and determinants. Liberalisation of world trade and agricultural markets, and the opening up of new markets (for example from central and eastern Europe to Africa, India and China), hinges on technology, including information technology and biotechnology, which have led to new products, production systems and new methods of organising the supply chain (Darroch, 2001; Hughes, 2004; O'Rourke, 2011). Any industry or firm operating in this sector thus is truly challenged to become and remain competitive in such a "dramatic" environment.

In his State of the Nation Address in 2006, the former President of South Africa, Thabo Mbeki, identified agriculture as a key contributor to South Africa's targeted economic growth of 6%. The National Planning Commission (NPC) confirmed this in 2011. The sector's importance lies in its potential to make a significant contribution to economic development through job creation, assisting with poverty alleviation, earning foreign exchange and providing rural development and household food security. During the 2009/10 season, apples contributed approximately 34% (R2.9 billion) to the total gross value of deciduous fruit (R8.8 billion) in South Africa (DAFF, 2012). The apple industry also makes an important contribution to direct employment in apple production and processing. It provides indirect employment for numerous support industries in the areas where apples are grown. In 2011, direct employment within the industry was estimated at 27 493 people with 109 971 dependents (DAFF, 2012).

According to their study of competitiveness, Van Rooyen *et al.* (2011) argued that being competitive is necessary for the long-term sustainability of the agricultural sector; therefore, businesses along the food value chain, including farmers, have to position themselves to be competitive in the world market. This situation raises questions about the competitiveness of the apple industry: how competitive is the industry, are there new market developments, what are the constraints and strong points, and how will these develop under future globalisation trends? The

competitive strength of the sector is affected by intensifying trends of globalisation, a broad spectrum of regulations and policies, and international trade negotiations. Consumer concerns regarding food safety and health have imposed requirements on agricultural products, and this calls for a highly dynamic, competitive and environmentally sustainable economy. These orientations directed the inquiry of this study.

1.2 Problem statement

Globalisation of the economy has contributed many new challenges to agriculture around the world. Agriculture not only needs to compete in its domestic markets, but also in new and foreign markets and needs to develop strategies to induce new customers in new markets to buy its products and attract investors (Kirsten, 1999; O'Rourke, 2011). It is for this reason that the issue of competitiveness has become important for agricultural industries, as these industries cannot sustain their financial relevancy and growth without producing and marketing competitive products and services (O'Rourke, 2011). According to Kalaba and Henneberry (2001), globalisation, technology and, in particular, rapidly changing trends in consumer behaviour have a strong impact on the way agricultural industries conduct their business. Siggel (2006) concurs and explains that the changes are also very dynamic, changing the nature of both farming and business.

The South African deciduous fruit industry is indeed highly influenced by a number of factors, including increased globalisation of markets, trade liberalisation, advances in information technology and consumer preferences (Ndou, 2012). These factors are changing rapidly and have a continuous effect on the competitiveness of such fruit, and also on the apple industry, and forces producers, traders and processors to position themselves as capable competitors in the global market environment.

Global deciduous fruit markets are becoming more sophisticated and competitive, thereby emphasising elements that could give an competitive advantage to the South African apple industry with regard to both the challenges of global competition and the satisfaction of local consumer demand; for example, according to Ortmann (2005), consumers worldwide have become more health conscious; they demand high-value products like fruit and vegetables, so industries like the apple industry need to be competitive enough to meet the required standard of apples required by consumers.

Furthermore, and according to Porter (1990), government plays a vital role in influencing the competitiveness of a sector or an industry, either positively or negatively. It can be argued that South African (SA) farmers are in a relatively unique situation when compared with other farmers from completing apple-producing countries. In addition to globalisation, the industry has had to adapt to the major deregulation of domestic agricultural markets in the mid-1990s, and to changing global trade practices together with a rapidly changing political and policy environment that has an impact on all aspects of the agri-food sector. Aspects such as land reform, black economic empowerment in agriculture (AgriBEE), new labour legislation, minimum wages, changed taxes and skills levies, increased administrative costs (water fees, electricity, fuel) have a strong impact on the competitiveness of industries. The government extension service has also shifted its focus away from serving commercial agriculture to advising and supporting mainly small-scale (emerging) producers, while the durability of water rights for irrigation farmers has become less certain (Kalaba & Henneberry, 2001). SA farmers, therefore, faced and still face a range of challenges to remain productive and competitive (Van Rooyen *et al*., 2011).

O'Rourke (2011) did a study on the competitiveness of apples in the world, based on three factors, production efficiency and infrastructure, input costs and the stability of financial markets. This analysis was partial, however, and too narrow to fully measure competitive performance; factors such as policies, markets, labour matters, research and development were not taken into consideration, in their own right, to determine competitiveness performance, as is suggested by Porter (1990) which argued for a far more comprehensive approach to measure and analyse competitiveness. Therefore there is a need for a more comprehensive analysis than that of O'Rourke to measure and analyse the competitiveness of the SA apple industry. However the O'Rourke measurement is highly respected in the industry, and will be used in this study, but only as a component of more comprehensive approach proposed.

The study thus aimed to develop and apply a more comprehensive framework of analysis to: define and measure SA's competitive performance; to establish a range of factors and determinants of such performance; and to propose some industry positioning strategies on how the South Africa apple industry can improve its competitive performance.

1.3   Research objectives and questions

1.3.1   Primary objective

The primary objective of this study was to design an analytical framework and methodology, and to apply this to do a comprehensive analysis on the competitiveness performance of the South African apple industry, taking into consideration the various factors mentioned above.

1.3.2   Secondary objectives

In order to reach the primary objective, a number of secondary objectives needed to be met.

These include:

- ➢ Defining competitiveness performance in the South African apple industry
- ➢ Measuring the competitiveness performance of the South African apple industry
- ➢ Determining the factors/elements that influence the competitiveness of the industry
- ➢ Proposing possible strategies that could promote the industry's level of competitiveness

1.3.3   Research questions

The following research questions were answered by this study and a conclusion was reached on them:

- ➢ How does one comprehensively define competitiveness in the SA apple industry?
- ➢ How can competitiveness performance be measured empirically?
- ➢ How can competitiveness performance be analysed and improved systematically?

1.4   Hypotheses

In order to focus the analysis, and in view of the problem statement above, the following hypothesises were formulated:

- ❖ Competitiveness in the SA apple industry is determined by a range of factors, which include productivity, market strategy, increased exports and local sales, the strength of the institutional support system, government policy and the value of the Rand.

❖ There has been a marked improvement in the competitiveness of the South African apple industry since the deregulation of the agricultural sector in 1997.

1.5 Analytical framework and research methodology

Guided by the research questions and objectives above, this study will use both quantitative and qualitative methods to measure the competitive performance and analyse the major constraints to and enhancements of the competitiveness of the South African apple industry. A "five-step" analytical framework was used to conduct the research. This framework was adopted from the work of ISMEA (1999), Van Rooyen, Esterhuizen and Doyer (2000), Esterhuizen (2006) and Van Rooyen *et al*. (2011). Each step takes full cognizance of the information gathered in previous steps, i.e. an interactive process is followed during the data gathering and analysis (the analytical framework is explained in full in Chapter 3).

Step 1: Define competitiveness, taking a comprehensive view of factors and forces impacting on competitive performance;

Step 2: Measure competitive performance of the South African apple industry empirically;

Step 3: Identify the major factors impacting on competitive performance through interviews with industry experts and knowledgeable stakeholders

Step 4: Analyse and cluster these factors to establish the strategic determinants of competitiveness for this industry; and

Step 5: Use the above information to propose strategic measures to enhance the competitiveness performance of the apple industry in South Africa.

1.6 The importance of the study

The long-term success of agricultural industries in today's changing business environment is determined by sustained competitiveness performance. Therefore there is a need to evaluate and understand the factors that have an impact on the competitiveness of industries, and to formulate some recommendations for appropriate strategies in order to show direction and where resources needs to be committed. By taking a comprehensive view of the factors that determine the competitiveness performance of the industry, this study will assist in providing guidance to the industry's stakeholders and executives for enhancing the competitiveness of their industry.

Added knowledge on which sets of factors have an influence on competitiveness will help the industry's stakeholders to make more informed decisions on how to enhance competitiveness.

1.7 Delimitations of the study

This study analysed the competitiveness performance of the South African apple industry only not that of the whole deciduous fruit industry. However, apples generally are produced (at the farm level) in combination with other deciduous crops. A more integrated view thus may be somewhat be lacking. The time period on which this study was based for measuring competitive performance was from 1961 to 2012, with emphasis on the post-deregulation phase (since the mid-1990s). This was due to data availability issues. The Apple Executive Survey also only covered the 2012/2013 period due to time constraints facing the researcher.

This study furthermore did not attempt to predict the future, but rather to use the relevant historical experiences to make some recommendations to enhance the competitiveness of South Africa apple industry. The study did not focus on particular varieties, but rather on the industry in general – thus not on specific business strategies or scenario development.

1.8 Outline of the study

The thesis is organised into six chapters. Chapter 1 has presented an introduction to the main thrust of the study: a problem statement; the research objectives and questions; the hypotheses of the study and its delimitations. The next chapter (Chapter 2) reviews the relevant literature on competitiveness analyses, with applications in SA agriculture. This chapter also establishes a definition of competitiveness; reviews previous studies conducted in the area of competitiveness; and evaluates the different measures of competitiveness. Chapter 3 presents the analytical framework, outlining the methodologies and data that were used.

Chapter 4 provides a descriptive overview of the South African apple industry. It deals with the key industry statistics and includes information on how the industry evolved over the years. The chapter also provides information on the industry's structure. Chapter 5 provides a description and interpretation of the research findings and results. Lastly, Chapter 6 provides conclusions, findings and recommendations on how the industry can enhance the competitiveness performance of the South African apple industry.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Competitiveness analysis has become a rapidly evolving area of research interest. This is evident from the increasing number of studies that have been conducted in this area (Esterhuizen, 2006; ISMEA, 1999; Van Rooyen *et al*., 2000). This interest in competitiveness has opened up the debate on the true meaning and understanding of competitiveness. The aim of this chapter is firstly to review the relevant literature on the concept of competitiveness and establish a definition thereof that is appropriate for use in the analytical framework of this study, i.e. the analysis of the competitiveness performance of the South African apple industry. Competitiveness is also a frequently misused and misunderstood terms (Ketels, 2006). The literature notes that the precise definition of competitiveness is subject to vagueness and that it has been explained and interpreted in different ways (Esterhuizen, 2006; Kennedy, Harrison, Kalaitzandonakes, Peterson & Rindfuss 1997; Ortmann, 2000; Siggel, 2001). The difficulty in defining competitiveness has been attributed to its multidimensional applications and interpretations. Some authors define it based on its sources, i.e. productivity, whilst others place more emphasis on the indicators of competitiveness, such as profits (Esterhuizen, 2006; Kennedy *et al.*, 1997; Ortmann, 2005). Two concepts, viz. competitiveness advantage and comparative advantage, are important to clarify the underlying factors responsible for current trade patterns, and a better understanding of how these two concepts pertain to measuring and analysing an industry's international competitiveness is also useful (Mashabela, 2007). Various methods and techniques used to measure competitiveness will then be discussed to direct the methodology of the enquiry and the analytical framework used in this study.

2.2 Comparative advantage and competitiveness

Competitiveness is grounded in the theory of comparative advantage (Ricardo, 1951). Siggel (2006) concurs and emphasises that comparative advantage is an important source of competitiveness, and that actual competitive performance is derived from comparative advantage, as well as from the benefits that domestic firms receive due as factors such as government support policies and research and technological developments. As a result, competitiveness is sometimes aligned with the concept of comparative advantage. Some authors use the term competitiveness synonymously or in a similar way as comparative advantage, while others view

it as an economy-wide characteristic. The concepts are clearly related, but there is also a clear difference between them. Therefore understanding the essential meaning of these two terms is important to define measure and analyse the competitiveness of an industry or a sector. It is for this reason that these concepts are discussed in more detail in this section.

2.2.1   Comparative advantage

The principle of comparative advantage is historically tied to the framework of Smith (1976), and as later revised in an attempt to understand the principles underlying free trade in goods and services (Pugel, 2004). According to Smith, a country can enhance its prosperity if it specialises in producing goods and services in which it has an absolute cost advantage over other countries, and imports only those goods and services in which it has an absolute cost disadvantage. This theory explains why, through imports, countries can increase their welfare by selling and buying goods and services in international markets. Smith thus viewed trade as a positive sum game. This was in direct contrast to the viewpoint of the mercantilists of the 16th century, namely that trade is a zero sum game. They believed that if countries wanted to become rich and powerful, they must export more and restrict imports to the minimum. Such a policy, for example, would result in an inflow of gold and silver that would make a country wealthy and, because they viewed trade as a zero sum game, they advocated strict government control and preached economic nationalism (Salvatore, 2002).

Ricardo's theory of comparative advantage is based on the labour theory of value. This implies that labour is the only production factor and that it is used in fixed proportions in the production of all products. The theory also assumes that labour is homogeneous (Salvatore, 2002). These assumptions are unrealistic in the real-world situation and led Ricardo to incorporate opportunity cost into the explanation of the theory of comparative advantage. If the Ricardian theory of comparative advantage is redefined in terms of opportunity cost, then a country will have a comparative advantage in the production of goods and services if such goods and services can be produced at a lower opportunity cost than in other countries (Pugel, 2004; Salvatore, 2002).

According to Lipsey, Courant, Purvis and Steiner (1993), comparative advantage refers to the ability of one nation to produce a commodity at a lesser opportunity cost of other products forgone than another nation. This implies that, despite absolute cost disadvantages in the production of goods and services, a country can still export those goods and services in which its absolute disadvantages are the smallest and import products with the largest absolute

disadvantage. It also implies that a country with absolute cost advantages in all its products will specialise and export those products of which the absolute advantage is the largest, and will import products with the smallest absolute advantages. According to Warr (1994), comparative advantage thus also leads to specialisation, but differs from specialisation based on absolute advantage in that a country will always import, whether or not it is more or less efficient overall in the production of all goods and services relative to other countries. According to Du Toit (2009), comparative advantage explains how trade could benefit nations through the more efficient use of the world's resource base (i.e. land, labour and capital inputs) when that trade is totally unrestricted, i.e. a free-market environment, or at least when 'an equal playing field' exists. In other words, comparative advantage indicates whether it is economically advantageous to expand the production and trade of a specific commodity.

2.2.2   Competitiveness

Although there is general consensus on what defines comparative advantage, there is less consensus on what defines competitiveness, despite the fact that the term has generated a great deal of debate. The Organisation for Economic Co-operation and Development (OECD, 2004) states that competitiveness is a dynamic concept that is strongly influenced by the macroeconomic and regulatory environment, with producers and processors (the micro-economy) in a continuous "treadmill" in the market place. The literature on competitiveness supplies a wide variety of definitions of the term. The difficulties in defining competitiveness derive from the various dimensions of this concept. The OECD (2002) defines competitiveness as the degree to which a nation can, under free trade and fair market conditions, produce goods and services that meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long term. Competitiveness is thus is a comparative concept of the ability and performance of a firm, subsector, industry or country to sell and supply goods and/or services in a given market. Competitiveness captures the awareness of both the limitations and challenges posed by global competition, at a time when effective government action is constrained by budgetary constraints and the private sector faces significant barriers to compete in domestic and international markets (Valentine & Krasnik, 2000).

Frohberg and Hartmann (1997) define competitiveness as an indicator of the ability to supply goods and services at the location, in the form, and at the time sought after by buyers, at prices that are as good as or better than those of potential suppliers, while earning at least the

opportunity costs of returns on resources employed. Therefore, a competitive firm, industry or country has the ability to meet the requirements of consumers with a product of the right price, right quality, right packaging, etc., creating place, time and form utility and, by doing this, expanding its ability to continue to trade and even expand.

Esterhuizen, 2006; Freebairn, 1986 define competitiveness. as the ability of an industry to trade its products successfully in order to achieve sustainable business growth within the global environment, while earning at least the opportunity cost of returns on resources employed"

Warr (1994) views competitiveness as an indication of whether a firm, industry or country could successfully compete in the trade of a commodity in the international market, given existing policies and economic structure. Worley (1996) concurs with Warr's (1994) definition of competitiveness, and further highlights that the term competitiveness explains existing trading patterns as they operate in the real world, including all the barriers to free trade, i.e. policy effects, product quality differences and industry marketing skills, which are ignored by comparative advantage. Ortmann (2000) and Fafchamps, De Janvry and Sadoulet (1995) define competitiveness as the ability of a firm or a country to produce a commodity at an average variable cost below its price. Yet, Porter (1998) states that even though a country can have good production factors, it does not guarantee its competitiveness, and this is mainly because of technology and management. Technology lets industries operate in a more sophisticated way and creates new alternatives. Spies (1999) concurs and emphasises that "competitiveness implies superior performance in productivity growth – especially in multi-factor productivity, which is best reflected in the effective rate of technological innovation in an economy".

The definition of competitiveness is also crucial in guiding the research methodology (Esterhuizen, 2006). For this reason, it also is important to determine a clear definition of competitiveness so that applicable measures of competitiveness can be used.

Warr (1994) summarises the definitions of comparative and competitive advantage and, according to him, comparative advantage refers to the ability of one nation to produce a commodity at a lower opportunity cost than another nation, while competitive advantage indicates whether a firm could compete successfully in the trade of a commodity in the international markets, given existing policies and economic structure. Khemani (1997) notes that comparative advantage can form the basis for building competitive advantage. The mere fact that

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a country has a comparative advantage in an industry does not imply that firms in that industry are internationally competitive. Ortmann (2000) argues that competitiveness and comparative advantage are closely related. Cordon (1974) and Kannapiran and Fleming (2000) argue that competitiveness and comparative advantage would be the same in a world of perfect competition in which there are homogenous products, perfect information and an absence of market failure. However, in the real world, the two typically differ because of distortions in inputs and product marketing systems. The only difference between the two is that competitiveness includes market distortions, whereas comparative advantage world argue for the removal of such market distortion, making this a more "policy-orientated" concept. Competitive advantage thus is determined by the commercial performance of individual firms or industries, whereas comparative advantage is about the economically efficient allocation of resources among sectors producing traded goods and services.

2.3 Research on the competitiveness of agricultural commodities

Given the recent global free-market orientation trends in the agricultural sector, it is not surprising that agricultural competitiveness has become the area of interest; as a result, numerous authors have recognised that the precise definition of competitiveness is unclear due to its multi-dimensional applications and interpretations, and many studies have been conducted in the area of competitiveness.

Vink, Kleynhans and Street (1998) conducted a study on the international competitiveness of Western Cape wheat production, using producer profitability of wheat production per hectare as a substitute for competitiveness. Producer gross incomes and production costs were also included in the comparison. This type of data was also used to compare the South Africa industry with Argentina, Australia, Canada, Britain, Germany, the USA and Zimbabwe (Mashabela, 2007). The results of the study showed that Western Cape wheat production was not internationally competitive. Wheat producers in countries having lower yields per hectare were found to have three times the net gross margin of SA producers. However, producer profitability cannot be used as the only measure of competitiveness, as competitiveness is determined by many factors, including those listed by Porter (1990), i.e. the competitiveness of a sector or an industry is determine by six factors, namely factor conditions, demand conditions, related and supporting industries, company strategy, structure and rivalry, government support and attitude and, lastly,

chance factors. Therefore, producer profitability is just a single measure, and although it is an important indicator at farm level, it does not capture all the elements of the concept.

In a study on the competitive nature of the SA sheep meat value chain relative to the Australian industry, Venter and Horsthemke (1999) applied the Porter's Diamond Model approach (considering the factor conditions; demand conditions; competitiveness of related and supporting industries; firm's strategies, structures and rivalry; the role of government; and lastly, the chance factors) to analyse the competitiveness. Southern African countries included in the analysis were Namibia and South Africa, and data from these countries were compared with data from Australia. The study found that Australia was more competitive than both South Africa and Namibia in terms of mutton production, but was not competitive in terms of lamb production. The study identified that an important factor constraining improvements in the competitiveness of the sheep meat value chain was the high cost associated with value adding by market participants in the retail sector. The study recommended that SA producers add more features to sheep meat products, thereby generating greater customer value, and also that the role players within the red meat industry form strategic alliances to improve the overall competitiveness of the value chain. Although the Porter Model was used to measure the competitiveness in this study, the Porter Diamond Model cannot be used as the only measure in the study, as it relates only to qualitative analysis.

Kalaba and Henneberry (2001) studied the competitiveness of South African apples, pears and grapes in the European Union. Their findings suggest that South African fruit exports are the least competitive among the selected suppliers, i.e. Chile, the United States, New Zealand, Argentina and Turkey using revealed comparative advantage (RCA) methodology. The authors argue that the lack of competitiveness from South African products might be attributable to many years of isolation or poor product quality compared to other products.

Mosoma (2004) analysed the agricultural competitiveness and supply chain integration of South Africa, Argentina and Australia using the Relative Trade Advantage (RTA) method developed by Balassa (1965) and extended by Vollrath (1991). The analysis shows that South Africa's agricultural food chains are marginally competitive internationally, whereas Argentina's and Australia's agricultural food chains are generally more competitive internationally than those of South Africa (these analyses were of the tobacco, maize, tomato, sugar and grape value chains). The findings show that South Africa has managed to move further up the value chain compared

to Argentina and Australia. It was concluded that, in all three countries, competitiveness decreases when moving from primary to processed products in the chain, which implies that value-adding opportunities are limited in these countries. The results support the findings of Venter and Horsthemke (1999), Blignaut (1999) and Esterhuizen and Van Rooyen (1999, 2001) that South Africa's agricultural competitiveness decreases when moving from primary to processed products in the supply chain, i.e. from farming to value adding Mosoma (2004) recommended that a great deal of attention has to be given to creating value-adding opportunities through aggressive research and the development of new products and production techniques.

Hallatt (2005) used three indexes, namely the Revealed Comparative Advantage (RCA#) index, the Net Export Index (NXi) and the Relative Revealed Comparative Trade Advantage (RTA) index to analyse the relative competitiveness of the South African oilseed industry by comparing it with that of Argentina. Hallatt's (2005) analysis shows that South African groundnuts and sunflower seeds have a competitive advantage in their primary form, but also found that oilseed has a competitive disadvantage, exactly the opposite of Argentina's oilseed products. The study revealed that the South African oilseed industry is struggling with a comparative and competitive disadvantage for value-added products. These findings led Hallatt (2005) to analyse the competitiveness of the secondary oilseed industry, and it was found that the oilseed industry also is price-driven. Hallatt (2005) then recommended that there should be innovations in sunflower oil production, and effective marketing and distribution of services for the industry to gain more of a competitive advantage.

Esterhuizen and Van Rooyen (2006) and Van Rooyen *et al*. (2011) measured the competitiveness of the SA wine industry and identified factors affecting that competitiveness. Using the Relative Trade Advantage (RTA) method they measured the operational trading performance of SA wines relative to international competitors. Key success factors affecting the competitiveness of the wine industry were found to be intense competition between market participants, the production of affordable, high-quality products, efficient supporting industries and the availability of internationally competitive local suppliers of primary inputs. The study found that the SA wine industry was highly competitive internationally relative to countries such as Australia, Chile, Italy and New Zealand. It was futher , noted in this study that fluctuations in the exchange rate, trust in the political support system, and the competence of administrative personnel in the public sector and the growth and size of the SA market were important factors for market participants,

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and were considered to be able to enhance the competitiveness of the SA wine industry in the future.

Esterhuizen (2006) analysed the competitiveness of 16 selected food commodity chains in South Africa using Balassa's (1965) RCA method for the period 1961 to 2002. The study revealed that the majority of these commodity chains were marginally competitive and that, except for the maize, pineapple and apple chains, competitiveness was found to decline when moving from primary to processed products. Fresh milk showed increasing competitiveness in both the long and short run, whilst the competitiveness of other dairy products such as cheese, butter and skim milk remained unchanged over the period 1961 to 2002. Esterhuizen (2006) noted that it is of vital importance that the underlying reasons for the lesser competitiveness of some commodity chains be identified. The reasons for lesser competitiveness of these commodity chains may relate to a lack of technical innovation, unproductive labour, high input costs or government trade policy. The study concluded by noting that strategic international alliances may be a possible solution to improving the competitiveness of poorly performing commodity chains.

Ndou (2012) wrote a paper on the competitiveness of the South African citrus industry in the face of the changing global health and environmental standards. This study measured the competitiveness of the South African citrus industry between 1987 and 2009 against its major rivals: Spain, the USA, Turkey, China and Morocco. South Africa is one of the top three countries dominating the citrus fruit export market. Since its entry into the citrus fruit export markets in the 1900s, the industry has sustained its activity in the international market. Due to the diversity of the definitions of competitiveness as a concept, this study formulated the following working definition: competitiveness is defined as the ability to create, deliver and maintain value and constant market share through strategic management of the industrial environment or competitiveness drivers (Ndou 2012). This was based on the understanding that the international market shares of an industry are a function of forces in the business environment, which range from intra-industry, external and national elements to international elements. Ndou adopted a stepwise methodology to measure the competitiveness of South African citrus industry, making use of both quantitative and qualitative methods. The quantitative measurement made use of the Constant Market Share model and the Porter Model, and questionnaires were used extensively for the determinants of competitiveness.

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O'Rourke (2011) did a report on the competitiveness of apple-producing countries in the world. The analysis to determine the competitiveness of each country was based on three criteria, the first being production efficiency, the second infrastructure and inputs, and lastly the financial market. Based on this analysis, South Africa was ranked 11th in the competitiveness of apples out of 29 major apple-producing countries in 2011. This analysis considered only some of the factors that determine competitiveness, not the overall factors that determine the competitiveness of an industry or a country, identified by Porter as factor conditions, demand factors, the firm's structure, rivalry, government support and policy, and lastly chance factors.

2.4 Measuring competitiveness

The aim of this section of the literature review is to highlight the various measures that are used to measure competitiveness quantitatively, with an emphasis on their results and limitations in order to choose appropriate methods to measure the competitiveness of the South African apple industry. This section will review as many measures as possible to show the wide variety of measures that can be used to attempt to measure competitiveness of the industry however not all these measures will be used in measuring the competitiveness of the apple industry, and only selected methodologies will be used. Valentine and Krasnik (2000) note that there are many ex-post and ex-ante methods developed and used by researchers to measure competitiveness (*e.g.* in terms of changes in the real exchange rate, foreign direct investment and domestic resource costs). It has been highlighted that single measures of competitiveness do not capture all the elements of the concept. Studies have argued that trade performance measures only do not adequately reflect the state of competitiveness. Despite these views, it is noted that competitiveness is most often associated with trade performance (Arndt 1993; Frohberg & Hartmann 1997). Imports and exports in a globalised trade economy therefore must be included when measuring competitiveness (Esterhuizen, 2006)

When analysing competitiveness, it is crucially important to be able to benchmark performance across nations, countries and sectors (Mashabela, 2007). Several variables have been used as indicators of competitiveness. Therefore, before any conclusions on the competitiveness of the South African apple industry can be reached, it is necessary to review a number of criteria and methods that are used to measure competitiveness. A precise and reliable method for measuring competitiveness is critical in order to give good results. The choice of measurement is also influenced by the particular question or aspect of competitiveness that one wishes to deal with,

for example studies can be carried out at various levels of product aggregation, across the entire economy, across a specific sector, or for a single product (or aggregate of products). Methods and techniques for measuring competitiveness include Revealed Comparative dvantage (RCA), Relative Trade Advantage (RTA), the Net Export Index (NXI), the Real Exchange Rate (RER), Foreign Direct Investment (FDI) and Unit Labour Cost (ULC), which are discussed below.

2.4.1   Revealed Comparative Advantage (RCA)

According to Bowen (1983), researchers have employed a number of measures of trade performance to study the structure and determinants of a country's foreign trade. A commonly used family of measures is indices of trade intensity, the most popular member of this family being the index of revealed comparative advantage. The concept of Revealed Comparative Advantage (RCA) is grounded in conventional trade theory. RCA can be indicated in terms of the trade performance of the individual commodity pattern of trade, which reflects the relative market costs and differences in non-price competitive factors (Balassa, 1965). The OECD (2004) argues that the Balassa method compares a country's share of the world market in one commodity relative to its share in all traded goods. The RCA basically measures normalised export shares with respect to the exports of the same industry in a group of reference countries (Siggel, 2006). The literature shows that this method has been applied in many studies in an attempt to measure trade competitiveness.

Balassa (1965) defined the RCA of a product as the ratio of the share of that product in world trade. Balassa's RCA method, an ex-post measure of competitiveness, compares a country's share of the world market in one commodity relative to its share of all traded goods, i.e. competition between all traded goods and not only selected ones. Given a group of reference countries, the Balassa RCA index basically measures normalised export shares, where the normalisation is with respect to exports of the same industry in the group of reference countries. In particular, if X_{Aj} is country A's export value of industry j, X_{refj} is industry j's export value relative to the group of reference countries, and we define $X_i = SjXij$ for $i = A$, $X_i = ref$, then country A's Balassa RCA index for industry j, i.e. RCA_{Aj} equals:

$$RCA_{Aj=} \frac{\left(\dfrac{X_{Aj}}{X_A}\right)}{\left(\dfrac{X_{refj}}{X_{ref}}\right)}$$

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All values greater than one signal that the country has a comparative advantage in the production of that product, and all values less than one signal a comparative disadvantage in the production of that commodity. In other words, if RCA_{Aj} exceeds 1, country A is said to have a comparative advantage in industry j, since this industry is more important for country A's exports than the exports of the reference countries

The RCA index is often multiplied by 100 for ease of presentation. An index of 110 for a particular industry in a particular country would then mean that its share of the world market in that industry is 10% higher than its share in total exports, and that the country has a comparative advantage in that industry (Mashabela, 2007). Figures below 100 indicate comparative disadvantage.

Vollrath (1991) improved the Revealed Comparative Advantage method. Vollrath's (1991) RCA index will be denoted by RCA# for the purpose of differentiating it from Balassa's (1965) original RCA. Vollrath (1991) improved the original version of Balassa's RCA index to reflect both imports and exports. The RCA# index considers the significance of a country's exports in a given sector and at the world level, and eliminates any double counting problems in world trade. Vollrath's (1991) RCA# formula is expressed mathematically as:

$$RCA\#_i = \frac{\left\{ \dfrac{X_{ij}}{\left[\left(\sum_i X_{ij}\right) - X_{ij}\right]} \right\}}{\left\{ \dfrac{\left(\sum_j X_{ij}\right) - X_{ij}}{\left[\left(\sum_j \sum_i X_{ij}\right) - \left(\sum_j X_{ij}\right)\right] - \left[\left(\sum_i X_{ij}\right) - X_{ij}\right]} \right\}}$$

where X_{ij} are the exports of sector "i" of country "j"; $\sum_i X_{ij}$ are the total exports of country "j" $\sum_j X_{ij}$ are the world exports of sector "i", and $\sum_j \sum_i X_{ij}$ are total world exports. An index of 1.1 for a particular industry (commodity) in a particular country means that its share of the world market is 10% higher than its share of total exports, and thus this country has a revealed

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comparative advantage in the industry (commodity). RCA# less than 1 indicates that the country has a comparative disadvantage.

2.4.2 Relative Trade Advantage (RTA)

Vollrath (1991) further expounded the Revealed Comparative Advantage (RCA) method to Revealed Trade Advantage (RTA) index. The RTA index describes a country's share of the world market pertaining to one commodity relative to its share of all traded goods. The RTA considers both export and import activities and this seems to be an advantage from the point of view of trade theory and globalisation trends. Due to the increase in intra-industry trade, this is becoming more important (Frohberg & Hartmann, 1997).

RTA is calculated as the difference between relative export advantage (RXA), which equates to the Balassa index, and its counterpart, relative import advantage (RMA). It can be expressed as follows:

$$RTA_{ij} = RXA_{ij} - RMP_{ij} \tag{Equation 1}$$

$$RXA_{ij} = \left(X_{ij} \ / \sum_{1,1 \neq j} X_{i1} \right) \bigg/ \left(\sum_{k, k \neq i} X_{kj} \ / \ \sum_{k, k \neq i} \sum_{1,1 \neq j} X_{k1} \right) \tag{Equation 2}$$

$$\text{(Equation 3)}$$

$$RMP_{ij} = \left(M_{ij} \ / \ \sum_{1,1 \neq j} M_{i1} \right) \bigg/ \left(\sum_{k, k \neq i} M_{kj} \ / \ \sum_{k, k \neq i} \sum_{1,1 \neq j} M_{k1} \right)$$

In Equations 2 and 3, X (M) refer to exports (imports), with the subscripts i and k denoting the product categories, while j and 1 denote the country categories. The numerator is equal to a country's exports (imports) of a specific product category relative to the export (import) of this product from all countries except the country under consideration. The denominator reveals the exports (imports) of all products but the considered commodity from the respective country as a percentage of all other countries' exports (imports) of all other products.

A positive value indicates a competitive advantage and a negative one a competitive disadvantage. If $RTA > 0$, export has a higher comparative advantage than import, but if $RTA < 0$, import has a higher comparative advantage than export.

A reality with these types of indices is that observed trade patterns are likely to be distorted by government policies and interventions, and therefore may misrepresent underlying comparative

advantages (Valentine & Krasnik, 2000). In addition, these two techniques do not reveal how a country acquired its competitive edge. Therefore, it fails to significantly reveal what the reasons are for the non-competitiveness of a country or an industry, or how the situation possibly could be rectified; it also says nothing about how a country acquires its market share, and does not provide a basis for discussion in the future. It does, however, provide a good indicator of trade performance, hence gives an accurate view of competitiveness as the definition is accepted in this study.

2.4.3   Net Export index (NXi)

Due to the criticism of the RCA index, which is that it only takes into account exports, overlooking the imports, another measure has been developed to calculate competitiveness and comparative advantage. Vollrath (1991) and Balassa (1989) suggested the Net Export Index as an alternative measure of competitiveness and comparative advantage bearing differentiated products, intra-industry trade, and flows of exports and imports in mind. In order to calculate the index, net exports (exports minus imports) are divided by the total value of the trade (exports plus imports) of the commodity in question, in this case apples.

The NX_i index formula is expressed mathematically as:

$$NX_i = \left[\frac{(X_i - M_i)}{(X_i + M_i)} \right] X\ 100$$

where X_i is exports and M_i is imports. An index with an upper limit of 100 indicates that there are no imports, and a lower limit of negative 100 indicates that there are no exports. According to Galetto (2003), the Net Export Index NX_i has one problem it does not take into account the overall level of trade in a specific commodity. This implies that a country that is relatively self-sufficient, with a small exportable surplus and no imports, would have an index of 100 and, therefore, appear to be very competitive, even though it hardly trades at all. For these reasons, Galetto (2003) recommended that both the RCA and NXi should be used together in assessing and analysing the comparative advantage and competitiveness of a specific industry or commodity.

2.4.4   Porter's Model

From the above it can be argued that only empirically based measures do not sufficiently reveal the competitive status of a product or country. Porter (1990) developed a competitive diamond model that offers an explanation of national competitiveness in an attempt to answer why some countries are more successful in particular industries than others. Porter (1998) noted that competitive advantage is derived from a firm's organisational structure and the way in which it performs its activities. Furthermore, he argued that, to gain competitive advantage, a firm must perform crucial activities more efficiently than its rivals (lower cost advantage), or perform these activities in a unique way, thereby generating increased buyer value and commanding a premium price (differentiation advantage). According to Porter (1990), competitiveness lies in four broad criteria or attributes that shape the environment in which firms or industries compete, with these attributes providing the underlying conditions or platform for determining competitiveness. These attributes are factor conditions, demand conditions, related and support industries, and company strategy, structure and rivalry. According to ISMEA (1999), Esterhuizen (2006) and Thomas (2007), Porter later included two additional attributes, namely government policy and the role of chance (exogenous shocks), which support and complement a comprehensive system of competitiveness. All the Porter attributes are detailed next.

2.4.4.1 Factor conditions

Factor conditions refer to the nation's position in terms of the factors of production, the level of natural resources or the production costs, such as the price of variable inputs (labour, pesticides, machinery, fuel or diesel), infrastructure and knowledge resources. The fact that a country has good non-key factors, such as unskilled labour and raw materials, does not generate sustained competitive advantage, as these can be obtained by any industry. However, specialised key factors, such as skilled labour, capital and infrastructure, lead to a competitive advantage, since these factors are more difficult to duplicate. According to Porter (1990), these key factors of production are created, not inherited.

2.4.4.2 Demand conditions

Demand conditions are based on the nature of domestic demand for an industry's product or service. Such conditions involve the effects of domestic composition, demand size and growth patterns, as well as the interplay of demand conditions (Porter, 1990). Demand conditions are an important factor in helping to produce competitiveness. A sophisticated domestic market

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pressures a company, industry or nation to sell superior products. The fact that markets demand high-quality products and close proximity enables companies or industries to better understand the needs and wishes of their customers.

2.4.4.3 Related and supporting industries

These refer to the presence or absence in the nation of suppliers and related industries that are internationally competitive. Porter (1990) explains that a set of strong, related and supporting industries is important to the competitiveness of firms or industries. These industries include input and service suppliers and the level of skilled labour available to the industry.

2.4.4.4 Firm strategy, structure and rivalry

Firm strategy, structure and rivalry relate to the national conditions governing how companies and industries are created, organised and managed, and the nature of domestic rivalry. Porter (1990) based the structure of firms on management styles, which vary among industries. Some countries may be oriented toward a particular style of management. If a particular management style suits a country it will tend to be more competitive in those industries in which that management style dominates. Rivalry spurs innovation, which is needed for sustainable competition. According to Oster (1994), the process of competition clears out inferior technologies, products and management practices, leaving only the most efficient firms as survivors. When competition is strong, firms are forced to become more efficient, to adopt new cost-saving technologies, to reduce product development time and to learn to inspire and control workers more effectively. The presence of strong domestic competition also encourages firms to look to outside markets for growth, particularly in industries in which scale economies are important (Porter, 1990).

2.4.4.5 The role of government

Generally, the government is supposed to play a significant role in international competitiveness of its country or industries. It can influence each of the above determinants, either positively or negatively, through government policies and operational capacity. The government acts as facilitator in this model, encouraging firms to become competitive and creating the environment that enables firms to increase productivity and become more competitive by improving the infrastructure and investing in specialised education and engineering, etc. (Kalaba & Henneberry, 2001). Porter (1990) argues, like everyone else, that there are some things that governments do that they should not, and other things that they do not do but should. He states that "government's

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proper role as a catalyst and challenger is to encourage or even push companies to raise their aspirations and move to higher levels of competitive performance".

2.4.4.6 The role of chance

The role of chance refers to events that have little directly to do with circumstances in a nation or industry, and that often are largely outside the power of firms (and often the national government) to influence. Porter (1990) emphasises the role of chance in his model of competitive advantage, stating that random events can either be beneficial or harmful to a firm or industry's competitive position. Wars, political decisions by foreign governments, large increases in demand, shifts in world financial markets and exchange rates, discontinuity of technology or major technological breakthroughs or inventions, and input demand can be described as chance events.

2.4.4.7 Application of Porter's Model

As Porter (1990) identified the six determinants of competitiveness, it is stated that the "Competitive advantage is created and sustained through a highly localized process". Porter goes on to note that differences in a country or a region or an industry's economic structures, values, cultures and institutions affect its competitiveness, along with the traditional notions of resource endowments and factor prices. He argues that the key issue is to know which factors affect the competitive advantage of the firms within the industries. In his diamond, the four "pillars" that determine the competitiveness of an industry or a sector are factor conditions, firm structure and strategy, demand conditions, and related and supporting industries. Chance factors and the government are auxiliary factors that influence the four pillars of the diamond (Mashabela, 2007). The Porter Model is illustrated in figure 2 below.

In applying his diamond framework, Porter focuses on an industry's capacity to improve, innovate and grow – all factors related to an industry's potential to expand and capture more global market share. Embedded within Porter's framework is a fundamental assumption that growth and relative productivity will determine an industry's long-term sustainability (Ndou, 2012).
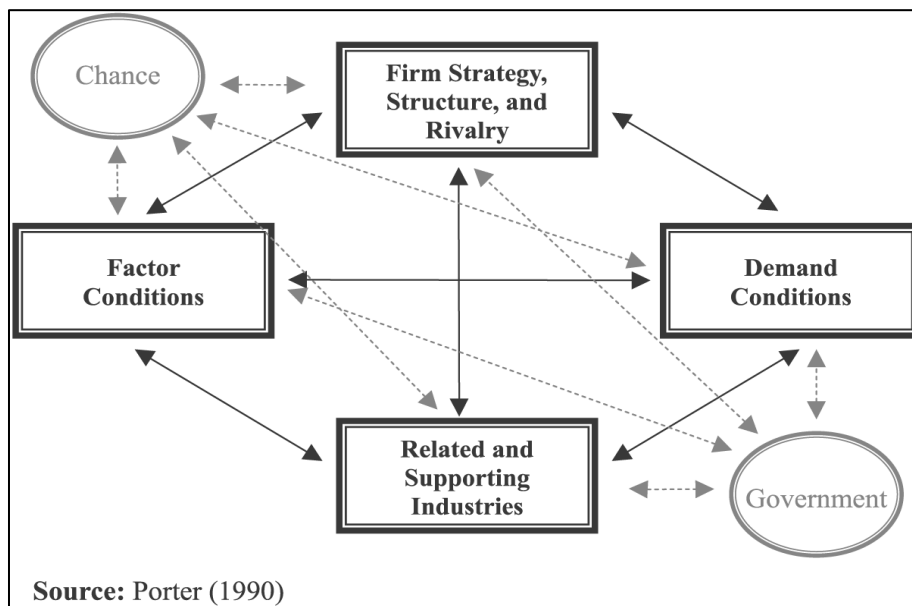
Figure 2.1 The Porter diamond
Source: Porter (1990)

A range of authors have criticised Porter for some of the judgements that he made as to what is important when it comes to competitiveness. However, the diamond remains a widely used framework for analysing the resources and constraints that influence industry competitiveness. Porter (1998) proposed that the diamond has to be considered as a system in which all the corners interact with each other. Competitive advantage cannot be obtained if only one corner of the diamond is favourable and the others do not enhance this source of competitive advantage. Similarly, the two external factors affect, in different ways, each of the four determinants of the diamond. Consequently, it is necessary, when using the framework, not only to analyse the effect of the determinants, but also to consider their interactions with the other corners and the external factors.

In South Africa, Porter's model (1990) has been widely used to measure competitiveness (Esterhuizen & Van Rooyen, 1999; Siggel, 2006; Valentine & Kransnit, 2000). Van Rooyen *et al*. (2000) explain that the Porter methodology was applied to an industry-wide analysis of more than 400 agribusinesses in South Africa. It is interesting to note that the International Institute for Management Development (IMD) also uses Porter's diamond analysis (1990) for the World Competitiveness Report. Therefore it is advantageous to use Porter's method because it does not only evaluate the competitiveness of the farmer, but that of all the participants in the supply chain. Siggel (2006) concurs and emphasises that Porter's method is the most recent theory that

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explains the competitiveness of countries: "It is the first multilevel theory to realistically connect firms, industries and nations, whereas previous theories only work on one or two dimensions." This method allows one to identify and analyse the structure of a sector and to point out its strengths and weaknesses, and critical strategic factors can be identified to which firms have to pay special attention to in order to develop and sustain competitive advantage in years to come.

2.4.5   Real exchange rate (RER)

An alternative way to assess competitiveness is to explore real exchange rate dynamics, proposed and used by authors within the IMF. According to Edwards (1989), the appreciation/depreciation of the real exchange rate of a particular country shows the loss/gain in the competitiveness of that particular country. Kazaks (2000) explains that an appreciation in the real exchange rate is associated with a loss in a country's competitiveness, while a depreciation in the real exchange rate implies an improvement. Edwards (1989) defined real exchange rate as the domestic relative price of non-tradable goods to tradable goods (i.e. an indicator of the incentives guiding consumption and the allocation of resources between the tradable and non-tradable sectors). This definition is represented following formula:

$$RER = \frac{p_t}{p_{nt}}$$

where

p_t = Price index of tradable commodities

p_{nt} = price index of non-tradable inputs

The price for non-tradable goods (i.e. goods only traded domestically) is also determined by domestic factors, while, especially in small countries, the prices of tradable goods (i.e. goods only traded internationally) are determined by international prices and the nominal exchange rate. Hence, an increase in the relative price of non-tradable goods indicates an increase in domestic production costs, and *ceteris paribus*, a reduction in the profitability of tradable sectors (Bella, Lewis & Martin, 2007). The cost of producing tradable commodities differs between countries because of the varying prices of factors of production used in the production of those commodities, for example input prices. Therefore, a relative increase in the cost of non-tradable

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inputs that is equivalent to an appreciation of real exchange rate will lead to higher production costs.

There are, in general, several problems associated with real exchange as a measure of competitiveness (Minale, 2002). The problems are categorised as conceptual and methodological. Two Conceptual problems are identified. Firstly, measuring competitiveness as a relative price or cost narrows the definition of competitiveness. The Competitiveness of a country or an economy cannot be expressed as a function of wages and price, relative to other countries, but it is also greatly influenced by non-price factors (for example delivery date, quality design, etc.). Secondly, the intuitive behind using the real exchange rate as a measure of competitiveness is difficult to apply in developing countries, which have developed countries as trading partners. The assumption of homogeneity of tradable inputs, both in the domestic economy and in the rest of the world, is embedded in the definition of RER. The assumption that technology is costless and available to all countries is implied in the definition of real exchange rate. Both of these assumptions do not hold in the real world: Technology is more costly and difficult to obtain in developing countries relative to developed countries, and tradables in developing countries are quite different from tradables in developed countries. Therefore, an increase in the world price of tradables with respect to the domestic prices of non-tradables does not indicate a shift of resources to the production of tradables in the economy of developing countries (Minale, 2002).

According to Bella *et al*. (2007), many authors have argued that RER cannot be used as a measure of competitiveness because it does not give consistent results; an appreciation of the RER will not always result in a loss of competitiveness and, conversely, a depreciation in RER will not always imply better competitiveness. Some examples may be useful to illustrate this point: (i) an increasing RER might be a reflection of productivity gains in the tradable sector, and (ii) even in the case in which productivity increases occur predominantly in the non-tradable sector, an RER appreciation is possible if the country under analysis has a fixed exchange-rate system, non-tradable prices tend to be sticky (i.e. inflexible downwards), and the government does not apply an accommodative policy (thus leading to higher interest rates). Thus, analysing competitiveness based only on the RER can result in misleading conclusions. Various authors have argued that the function of real exchange rate is to close an excess-supply gap when an import tariff is imposed, and to close an excess-demand gap when export tax is imposed. Then it

becomes the price of the export good when an import tariff is imposed, and it becomes the price of the import good when export tax is imposed. The RER thus may influence competitiveness.

2.4.6   Foreign Direct Investment (FDI)

According to Narula and Wakelin (1998), the post-war era has been a significant period for growth in foreign direct investment (FDI) and world trade. They aspects both form important determinants of national competitiveness. It has been explained that one way to overcome trade barriers is by investing in other countries. FDIs therefore can lead to a partial substitution of exports. Thus, if a particular nation has a high level of investment in foreign countries, this is also seen as an indicator of competitiveness. With increased globalisation over the last decades, the phenomenon of FDI has increased and it has become very important for global business. According to Venter and Horsthemke (1999), countries differ in their factor endowments; the Hecksher-Ohlin model leads to factor price differentials among the countries. Therefore, a relatively capital-abundant country would either export the capital-intensive good to the host country, or move capital to foreign locations where there is a high return on capital and low return on labour until the equalisation of factor price. Thus, FDI is also used as a measure of competitiveness, because the factors that make a country attractive to inward FDIs are similar to the factors that determine their competitiveness. For example, a country will attract FDIs if it has the advantage of production conditions that the country making such an investment are lacking.

According to Siggel and Cockburn (1995), FDI has played an important role in the economic development of many developing countries. First, it has provided an additional source of capital and expanded host country production activities. The inflows of capital in the form of FDI allow host economies to invest in production activities beyond what could be achieved by investing domestic savings alone. Second, it has promoted exports and trade, especially in the more open host nations. It is often argued that there is a strong correlation between export growth and FDI inflows. Third, FDI has crucially helped to transfer new technology to the host country. In general, FDI provides the fastest and most effective way to deploy new technologies in developing host countries. Thus, the amount of FDIs a foreign country attracts is seen as a sign of competitiveness of that nation as a whole, or of the sector or region attracting the investment. Van Rooyen *et al*. (2000) agree that an industry that is not competitive will not attract investment.

2.4.7   Unit labour cost

The measures of competitiveness have been expanded to include the index of unit labour cost. The unit labour cost measure gives an indication of cost pressures in a given sector or economy. According to Esterhuizen (2006), unit labour cost can be defined as the ratio of labour compensation (i.e. the nominal wage rate plus all other labour-related costs to the firm, such as payments in kind related to labour services, social security, severance and termination pay, and employers' contributions to pension schemes, casualty and life insurance, and workers' compensation and, in some cases, payroll taxes as well as fringe benefits taxes, etc.) to labour productivity (output per man hour). The formula can be represented as follows:

$$ULC_n = \frac{W_n}{\left[\frac{Q}{H}\right]}$$

where

W_n represents the nominal wage rate,

Q represents domestic production,

H denotes the number of hours worked, and

$\left[\frac{Q}{H}\right]$ is equal to labour productivity (P).

Firms obviously do care about unit labour costs, because they track the relationship between their total labour costs and how productive workers are. If a firm's unit labour cost increases, and even more so vis-à-vis that of its competitors, it most likely will lose market share and its growth expectations will be affected negatively (Lall, 2001). Thus, ULC_n is directly related to the nominal wage rate and inversely related to labour productivity. As labour productivity increases, the labour input required to produce a unit of output decreases, therefore unit labour cost decreases and this increases the competitiveness of the country, for example Switzerland is one of the lowest labour-cost countries in the industrial world because of very high labour productivity (Nabi & Luthria, 2002).

There are various combinations of W_n and P that would result in either an increase or decrease in ULC_n. Table 2.1 below examines those combinations that lead to a decrease in ULC_n. The converse is true for an increase in ULC_n

Table 2.1 A Decrease in Unit Labour Cost

Nominal wage	Productivity
Decrease	Same
Same	Increase
Increase	Increase*

* At a faster rate than the increase in W_n
(Source: Lall, 2001)

The view is often expressed that, in order to improve a country's international competitiveness, unit labour cost must be reduced, as this can result in lower production cost and thus lower prices, assuming that all other costs of production remain fixed. This implicitly assumes that international prices will remain unchanged, resulting in lower domestic prices relative to those of major trading partners. Similarly, there exists a notion that unit labour cost refers specifically to a decrease in the nominal wage rate. While this view is correct to a certain extent, decreases in unit labour cost generally occur as a result of increased productivity. Nominal wages tend to rise over time due to inflation, so for ULC_n to fall, it must be that output per man hour increases at a faster rate than the increases in nominal wages.

Unit labour cost suffers a number of drawbacks as measures of competitiveness. According to Esterhuizen (2006), countries cannot be compared across each other using unit labour cost, as it first needs to be converted using a common denominator, such as the exchange rate. The variables required to calculate unit labour cost, such as wages, product prices, output and exchange rate, represent both micro- and macro-elements of the economy. However, calculating unit labour cost is difficult given the sensitivities allied with acquiring accurate wage information and the difficulty of finding a comparable basket of goods across nations. Therefore it is virtually impossible to get an accurate unit labour cost for most developing countries. Furthermore, competitiveness based on low labour cost does not last for a long time, meaning it is not sustainable, because history shows that successful nations have a tendency to close the labour cost gap more quickly than their competitors.

2.5 Concluding remarks

Competitiveness can be analysed at various levels – either at a macro- or a microeconomic level – depending on the objectives in competitiveness analyses due to the desired outcomes of those analyses (Esterhuizen, 2006). Methods such as the Revealed Comparative Advantage (RCA) and Relative Trade Advantage methods developed by Balassa (1965) and Vollrath (1991) respectively, are examples of commonly used methods for a more comprehensive and macroeconomic measurement of competitiveness. Porter (2005) argues that most of the discussion regarding competitiveness is related to the macroeconomic, social and legal policies that form the basis of a successful economy, and that these factors are necessary but not sufficient for explaining competitiveness. Porter (2005) maintains that, although the implementation of proper statutory institutions provides the opportunity to create wealth (competitiveness), these do not create wealth themselves. This is due to the fact that wealth is created at the microeconomic level by the capabilities of a nation's companies, a process driven by the microeconomic business environment in which these companies compete. Therefore, the Porter method is one of the measures of competitiveness at both the macro- and microeconomic levels and focuses on the factors or determinants of competitiveness performance in countries and industries.

According to Oster (1994), on the other hand, the microeconomic concepts, which apply to single producers or industries, are less controversial despite the variety of indicators within this group. Although the public discourse in recent years has focused more on the macro-concept, it is less well established in economic theory than the micro-concept. Countries may compete for market share or for foreign investment, but the attributes of stability, good government and profitable investment opportunities are better summarised as a favourable business climate than competitiveness.

Additionally to RCA and RTA, possibly the best known version of the macro-concept is the World Competitiveness Index, which is computed and published yearly by the World Economic Forum and Institute of Management Development (WEF/IMD, annual since 1995). The index is the basis for an international ranking of countries in terms of their business climate. It is a composite of a large number of attributes condensed into a single index. It may serve a useful purpose for international investors, but its theoretical base and, especially, its aggregation method are problematic (Mosoma, 2004).

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Microeconomic concepts and indicators of competitiveness have a more solid theoretical base, because they focus on the essential characteristics of producers in competition for market share and profits or the ability to export. This ability can be measured by the size of or increase in market share, by export performance, by price ratios (cost competitiveness), or by more complex and multi-dimensional indicators (Porter, 1990). These indicators differ from each other in terms of various characteristics, especially in terms of the number of dimensions on which they focus.

There are certain problems in measuring the competitiveness of a country or an industry. According to the OECD (2004), one of the biggest constraints involved in measuring competitiveness is the lack of reliable data on production costs at farm level, as few producers have good information about their cost structures. Competitiveness at production level is also strongly influenced by the prices farmers receive from their final output. The OECD (2004) states that production can be competitive over a wide range of farm sizes once the minimum farm size and technology level have been reached. The OECD (2004) states that the relatively low productivity and the low quality of many products, caused mostly by the two fold structure of agriculture, i.e. the small number of commercial farmers and the large number of subsistence farmers, generally hamper the attainment of a competitive supply chain.

CHAPTER 3: ANALYTICAL FRAMEWORK AND RESEARCH METHODOLOGY

3.1 Introduction

In the previous chapter, the concept of competitiveness in the agricultural sector and its definitions and measurements were considered in order to create an appropriate analytical framework for the study. The main objective of this chapter is to develop such a framework that will be used to measure and analyse the competitiveness of SA apple industry. The analytical framework will guide in answering the research questions outlined in this study and will define the methodology followed in achieving the objectives of this study.

Esterhuizen (2006) explains that there are three very important aspects that need to be looked at when developing a theoretical framework to analyse a sector or industry`s competitiveness status. Firstly, it is important to determine the current and past competitiveness of a sector or an industry. The second aspect is to determine the key success factors that established such a competitive advantage, while constraints that adversely affect the competitiveness of a sector must also be determined. Lastly, the sustainability of the sector's competitiveness status must be investigated.

3.2 Analytical framework

Given the conditions above, a framework analysis consisting of five steps and derived from similar frameworks used by Esterhuizen (2006), and recently by Van Rooyen *et al.* (2011) and Ndou, 2012, was used to direct the analyses of the competitiveness performance of the SA apple industry.

Step 1: Define and describe competitiveness: Competitiveness is defined in various ways but, to achieve the study's objectives, it was imperative that an appropriate and unambiguous definition of competitiveness be adopted so that applicable measures of competitiveness could then be chosen. Based on the literature review in Chapter 2, competitiveness in this study was defined as the ability of an industry (apple industry) to compete successfully in order to achieve sustainable business growth within the global environment while earning at least the opportunity cost of returns on resources employed (Esterhuizen, 2006; Freebairn, 1986; Van Rooyen *et al.*, 2011).

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Step 2: Measuring competitive performance of the South African apple industry: Step 1 laid the foundation for the analysis. The challenge now was to select an appropriately method to be used in this study to measure the competitiveness of the South African apple industry, from the measures that were reviewed in Chapter 2. This step measured whether the South African apple industry could compete globally. Step 2 employs quantitative methods, with the collection and preparation of appropriate data sets. As mentioned in the literature review, the measures of competitiveness differ with respect to the level of investigation; RTA, RCA# and NXI measures will be used to measure competitiveness in this study. RTA (Revealed Trade Advantage) method allows for the comprehensive measurement of competitiveness under real-world conditions, such as uneven economic "playing fields", distorted economies and different trade regimes, and therefore is the most suitable measure of competitiveness where such conditions prevail, as in global apple trade, with various levels of government intervention, price distortion subsidies, etc. (Mashabela, 2007).

RCA# is used in this chapter to calculate the comparative advantage of the South African apple industry. The RCA# has been widely criticised since it only takes into account exports, ignoring the level of imports. According to Vollrath (1991), with differentiated products, intra-industry trade and flows of exports and imports, net trade effects should be taken into account (Mashabela, 2007). For this reason, Galetto (2003) recommended that both the RCA# and NXi should be used together in assessing and analysing the comparative advantage and competitiveness of a specific industry or commodity as NXI takes into consideration both imports and exports of the product in consideration.

Using RTA as a measure of competitiveness supports the final definition of competitiveness referred to in this study; therefore it was necessary to determine how successful the industry traded its products over time in the local and global environment relative to other competitors. For this reason, import and export data were used to determine the competitiveness of the South African apple industry. The data was sourced from FAOSTAT and the Trade Map database, available on the internet at www.fao.org and www.trademap.com respectively. A combination of these databases was used because, at the time when this analysis was done, the 2011 and 2012 data was not available on FAOSTAT, and also FAOSTAT also only provides data for agricultural products, therefore statistics on all products traded in South Africa, the other

countries that were considered in this study and those that trade in the world, were sourced from Trade Map.

Other measures, such as factor productivity, product characteristics, unit production cost and profit ratios, organisational performance and benchmarking or applied comparative advantage analysis, only describe certain aspects influencing competitiveness and thus are "more restricted", not dealing with "playing fields" issues as the RTA formula does (Porter, 1990).

Step 3: Identifying the factors of competitiveness in the SA apple industry: In order to determine how competitive the SA apple industry is, it was necessary to determine key factors that enhance the competitive advantage and those that constrain the competitive advantage. In Step 2, quantitative data was used to measure the competitiveness performance of the SA apple industry. Step 3 employs qualitative method by making use of the information gathered from questionnaires that requested information on the factors affecting competitiveness. The questionnaire was sent to 100 participants through the offices of Hortgro (the horticultural commodity group). These were industry participants and farmers, as they are the ones who are responsible for taking decisions affecting the success or failure of the industry. The questions were both open-ended and closed-ended, and the questionnaire is attached as Annexure A of this thesis (the Apple Executive Survey (AES). Two focus group discussions were held with the Hortgro working group and personal interviews were held with experienced farmers in the apple industry to capture the opinions and perceptions of the people responsible for strategic direction and executive level decisions in the SA apple industry.

Step 4: Determinants of competitiveness in the SA apple industry (applying the Porter Model): This step in the analysis compliments the step above, as it summarises and groups the factors identified by the selected industry participants into clusters of determinants of competitiveness. The methodology, developed by Porter (1990) to analyse competitiveness (Porter's Diamond), was used in an adapted form to derive the key determinants that both enhance and constrain the competitive performance of the apple industry in South Africa. The information from the AES and the related focus group and individual sessions thus was interpreted in the Porter Diamond determinant categories. According to Porter (1998), six broad competitiveness attributes that each nation establishes and operates for its industries must be considered. These are:

Factor conditions – the industry's endowment in factors of production, such as climate, terroir, skilled labour, infrastructure, etc. necessary to compete.

Demand conditions – the nature, changes and knowledge of the market demand for the industry's products or services.

Relating and supporting industries – the presence or absence of competitive suppliers and other related industries.

Firm strategy, structure and rivalry – the way companies are created, organised and managed, as well as the nature of domestic rivalry.

Government support and policy – government can influence each of the above determinants, either positively or negatively, through policies and the environment that is created, funding support and the provision of public goods to support private operational capacity and social stability.

The role of chance (or luck) – chance factors/events/ luck are occurrences largely beyond the power of individual firms and governments. Such events can nullify sources of competitive advantage, and create new ones.

Step 5: Developing strategies to enhance the competitiveness of the apple industry in South Africa: The above steps provided viewpoints on the issue of competitiveness, and contributed to the greater understanding and a comprehensive statement on the competitiveness of the South African apple industry. The information gathered from all the above steps therefore was used to determine whether the industry can compete internationally or not, and was used to propose strategies to enhance the competitiveness of the apple industry in South Africa. The proposed theoretical framework to measure the competitiveness of the South African apple industry is schematically indicated in Figure 3.1. This framework guided in answering the research questions raised in this study; in addition, it helped in achieving the objectives of this study.
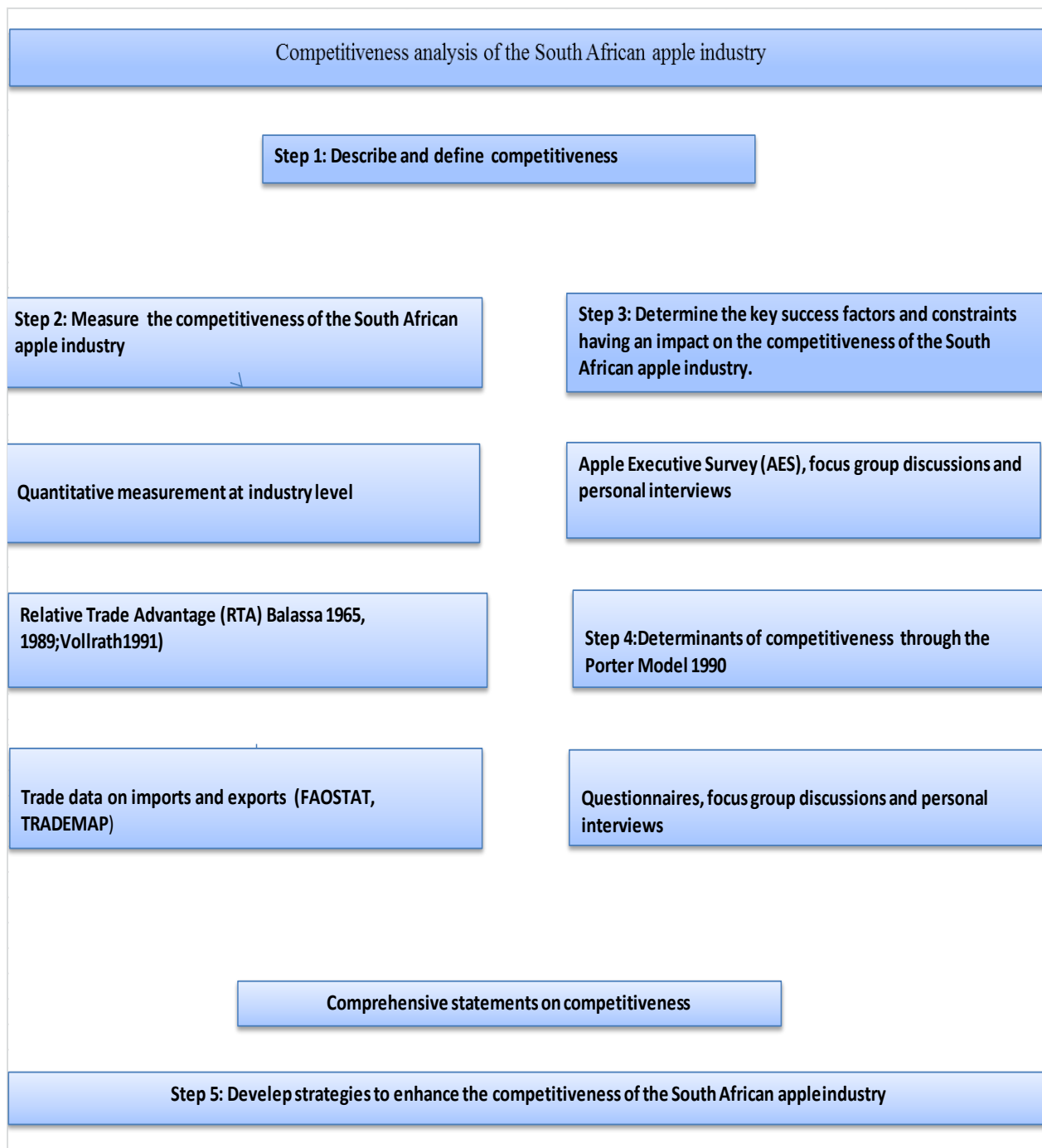
Figure 3.1 A framework to measure and analyse the competitiveness of the South African apple Industry
Source: Adopted from Esterhuizen (2006)

3.3 Data used

Trade data was used for the measurement of competitiveness. Both primary and secondary forms of data collection were used in this study. Secondary data basically were the trade figures and destinations to which South African apples are marketed internationally. Available export and

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import data were obtained from the database of the Food and Agricultural Organisation Statistical office (FAOSTAT) and the Trade Map database. Trade data from between 1961 and 2012 were considered for this study. FAOSTAT-Agriculture provides trade statistics on crops, livestock, irrigation, land use, fertiliser, pesticide consumption and agricultural machinery. FAOSTAT data takes into account only agricultural commodities, (Mosoma, 2004). Trade Map provides import and export values, volumes, and growth rate and market shares for all products. Trade Map covers 220 countries and territories and 5 300 products that are traded globally.

Primary data on the factors that determine the competitiveness of the apple industry were gathered from prominent industry players, farmers and the Hortgro working group, using questionnaires, focus groups and personal interviews (the Apple Executive Survey).

3.4 Sampling method

The population of interest was producers, also those providing strategic inputs and those on the Hortgro member list for the apple industry. There are 150 producers of apples in the Western Cape. A non-probability method was used to determine the sample size that best represents the population of apple farmers. One hundred questionnaires were distributed by e-mail through the offices of Hortgro to farmers in the Western Cape province, since the Western Cape is the major apple-producing province in South Africa; sixty-one questionnaires were returned by the respondents and were used in the analysis. This represents a response rate of 61%.

The 39% no response rate was considered in terms of the following, firstly the letter of request to respondents to participate in this study was analysed and it was found to be clear and concise. Secondly Hortgro members email list was used correctly although it was establish that not all email addresses might have been in a working status. Thirdly, the time of sending out the questionnaire (end May-end June) coincide with the time when most deciduous fruit producers take their annual break or visit their overseas markets, It was thus decided that a 61% response (61questionnaires) received would entail a sufficient opinion or statement.

3.5 Data analysis and verification

The primary data of this study were collected through questionnaires. This data was then used to establish the nature of the Porter determinants. The advantage of the diamond model is that it allows for a comprehensive statement on all relevant matters affecting competitiveness (Porter,

1990, 1998). While the approach points out the weaknesses and strengths of a sector, it also identifies critical success factors to which special attention can be paid, with the objective of developing and sustaining competitiveness as successfully as possible in years to come.

The first stage of data analysis was to prepare the raw data and transform them into a machine-readable format. A database was created on the basis of the information collected, in the form of spreadsheets in MS Excel. Descriptive statistics were used for analysing the collected data. The main descriptive indicator that was employed was mean values. Excel and the Statistical Package for Social Scientists (SPSS) were used to run the data collected from the questionnaires.

Focus groups were also used in this study to gather and verify the qualitative measures of the competitiveness of the South African apple industry. Such groups have clear advantages, one being that focus groups are an economical, fast and efficient method for obtaining data from multiple participants, thereby potentially increasing the overall number of participants in a given qualitative study. Interactiveness of the discussion in a focus group provides a particular advantage to the analytical processes, i.e. offering the analysis resulting from previous steps and then requesting participants to respond and comment – a focused screening of the analysis from Steps 1, 2 and 3). The information from the focus group was used to discuss and analyse the trends in the competitive performance of the South African apple industry measured using the RTA methodology. Unstructured interviews were conducted with experienced farmers to describe the trends in the competitive performance of the SA apple industry and to determine the factors that constrain and enhance the competitive performance of the industry.

CHAPTER 4: AN OVERVIEW OF SOUTH AFRICAN APPLE INDUSTRY

4.1 Introduction

The structure of an industry will determine how it deals with ever-increasing local and international competition and utilises or combats the effects of these forces by effectively focusing on its strategic areas (Porter, 1990). In considering the competitive performance of the South African apple industry, it is important understand the context and to know where the industry has come from and where it is expected to go.

The purpose of this chapter is to provide a descriptive overview of the South African apple industry. First, the historical background, information on how the industry evolved over the years since it started and production trends will be discussed. The focus will be on the post-deregulation period, i.e. mid-1990s onwards. The chapter secondly provides information on the industry structure during and post the regulated marketing of agricultural products. The chapter concludes by looking at marketing structures and aspects of the value chain in the South African apple industry.

4.2 A short historical overview

Apples belong to the deciduous fruit industry, which is believed to have been established in South African in 1652, during the settlement of the Dutch at the Cape of Good Hope. According to Du Toit (1981), the deciduous fruit industry was "born" on 24 August 1652, although little is known about the first varieties that were planted. There were many factors constraining the development of the fruit industry, including the lack of a well-established marketing system, and institutional and market infrastructure kept the development of the industry at a suboptimal level, as did the quality of fruit produced. The formal development of the industry has its origins in the early 19th century, when the industry excelled to new levels with the development of railway lines through Mitchell's Pass, forming a direct railway link from the high-potential production areas to the Cape Town harbour, which facilitated the export process. Producers were encouraged to produce more, which is evident from the fact that the SA apple industry saw an increase in the number of fruit trees planted (Beukes, 2009). Despite the increase in production, many factors continued to inhibit the growth of the industry, e.g. essential facilities and the infrastructure

necessary for good agricultural practices were lacking The growth of the fruit industry was also generally constrained by the 1933 depression (DFPT, 2003).

During World War II (1939 to 1945), exports virtually came to a standstill and only resumed when the war ended. Du Toit (1981) explains that it was only after World War II that exports, especially to Great Britain, started their dramatic growth. The post-war years were a period of progress on all fronts for the industry. More research was carried out, and new and improved cultivars, more effective methods of pest and disease control, new irrigation techniques, and significant advances in production methods and management skills were developed in the industry. These resulted in an increase in the production of apples and hence an increase in exports to European and UK markets. Through export trade the South African deciduous fruit industry thus came to be, developing from humble beginnings in the Western Cape in 1652 into an internationally recognised business.

The policy and institutional environment in which the agricultural sector operates has also changed dramatically over the decades, and this has had an impact on its structure and performance, with certain sub-sectors being affected more acutely. The analysis that follows focuses primarily on the past twenty years, as this period saw major changes from an economic, social, political and technical perspective, which had a dramatic impact on the competitiveness of the sector. Important earlier changes will also be highlighted.

The description begins by sketching the major policy changes affecting the agricultural sector, and then gives an indication of how this has affected the horticulture export industry, in particular the apple industry.

Historically, the South African agricultural sector has been heavily regulated, having been influenced significantly by the existence of many statutory boards. Like other agricultural industries, the deciduous fruit industry was regulated, and its marketing was controlled by a central body under the deciduous fruit scheme. According to De Swardt (1983), the first control boards for the marketing of agricultural products in South Africa were introduced in 1934 as a result of the recommendations of the Viljoen Committee. Another Marketing Act was introduced in 1937. Under this legislation, agricultural commodity producers could call for the introduction of a scheme to market their produce. The Deciduous Fruit Control Board was formed to modernise and strengthen farming. The Board was given monopolistic powers over the

distribution of deciduous fruit products (Broens, Van Dyk & Tavasszy, 2000). According to Keetch (2000), the Marketing Act of 1937 gave the Deciduous Fruit Board powers to fix prices and to regulate the overall marketing of the deciduous fruit industry.

In 1968, the South African agricultural sector, under the apartheid regime, introduced a new agricultural marketing system, viz. the Agricultural Marketing System Act of 1968 (Act No. 59). Its main objective was to control the production, movement, pricing, quality standards, selling and supply of a large volume of farm produce, securing price stability and narrowing the gap between producer and consumer prices in South Africa (NAMC, 2008). However, this Act was fundamentally racially orientated and also excluded other categories of farmers, such as smallholder farmers and part-time farmers, in favour of commercial farmers (Mashabela, 2007).

In 1986 the powers of the Deciduous Fruit Board were delegated to the Universal Fruit Trade Cooperative (Unifruco) to be solely responsible for the distribution, marketing and export of fresh produce on its behalf.

In 1992, the Kassier Report on South African marketing schemes called for the abolition of all control boards and the deregulation of agriculture.

These recommendations were supported by the African National Congress (ANC), the governing political party after the first democratic elections in SA in 1995, and became official government policy and were eventually taken up in the new Marketing of Agricultural Products Act, No. 47 of 1996. This new Act represented a radical departure from the marketing regime to which farmers had become accustomed in the period since the 1930s.

The Act came into operation on 1 January 1997, was racially neutral and, among others, aimed at increasing market access to all market participants, promoting efficient marketing of agricultural products, optimising export earnings from agricultural products, and enhancing the viability of the agricultural sector (NAMC, 2008).

This policy change led to numerous other changes. However, as much as the deregulation and liberalisation of the South African agricultural sector brought opportunities, it had its own challenges. These included:

- Government policy, for example, aimed at promoting black farmers, including smallholder farmers, to benefit from this Act.

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- The deregulation increased the vulnerability of producers to external commercial risks and increased the competition between them to access the more profitable northern hemisphere markets. According to Barrientos *et al*. (2003), the process has affected some fruit producers and exporters in the industry negatively; others have been able to ride the crisis successfully; but some, for example many smallholder farmers, have been left struggling or have gone out of business.

- Phasing out the control and marketing boards led to a short-term shortage of essential services formerly provided by the boards, such as storage, grading, deliveries, value adding, information development and dissemination, and research development and technology transfer.

- There was a collapse in information systems. To operate, the free market needs good information, and the industry still suffers from a lack of this due to the deregulation process. This is in contrast to regulated markets, in which quality standards were simple to maintain because producers were exporting through a single channel. This advantage was lost in the deregulated market environment.

- According to Vink (2003), the first effect of deregulation in the fruit export industries was increased competition as hundreds of marketers and marketing agents entered the industry, and that resulted in a sharp decline in price and in quality delivered to a global market characterised by a rising demand for new products and a stagnant demand for conventional cultivars. Vink (2003) argues that the apple industry was hardest hit and experienced a decline in exports in the period immediately after deregulation in the mid to late 1990s. Nevertheless, total fruit exports increased in volume and value in the post-deregulation era.

- Van Rooyen *et al.* (2000) state that these changes required that producers and agribusinesses had to position themselves as business-driven competitors, not government-directed producers, operating in a less controlled and highly competitive global trading environment.

- Darroch (2001) observed that the deregulation of the marketing of agricultural products in South Africa since 1996 created a much wider range of marketing alternatives for a number of commodities. This meant that the deregulated market structure now in place allowed freedom of choice. Producers were free to choose through whom to market their fruit; they could choose their own exporters and foreign markets. Under the newly

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deregulated trading regime, producers thus were exposed more to the shifting demand for new fruit types and varieties.

- De Vos (2003) also argued that, prior to deregulation in 1997, there was a situation of single-channel marketing for most deciduous fruit: this meant that the supply chain was structured and served relatively simply and was easy to manage. This feature has been lost since the deregulation of the fruit sector in 1997.

- Vink (2003) argues that all of this resulted in a new investment boom, as farmers have shifted replanting and new plantings to reflect this change in demand.

4.3 New industry structures since deregulation

After the deregulation process, started in the mid-1990s, and with the abolition of the activities of the Deciduous Fruit Board, several new representative organisations were formed. The industry's new structure comprises producers, the different fruit associations, namely Fruit South Africa (FSA), the South African Apple and Pear Producers' Association (SAAPPA), the South African Stone Fruit Producers' Association (SASPA), and the Deciduous Fruit Producers' Trust (DFPT), which is the umbrella organisation for the producers in the industry Moreover, after deregulation, the industry experienced growing numbers of private companies involved in fruit marketing and distribution (Louw & Fourie, 2004); in many cases, poor coordination in the fruit value chain resulted in high transaction costs and financial losses to role players (Du Toit, 2000). Much emphasis was also put on the export market, resulting in a general neglect of the role of the domestic market. This is evident in, amongst others, the general perception that poorer quality fruit are normally directed to the domestic market (largely the FPMs after deregulation), the generally poorer state of infrastructure available for fruit distribution and marketing on domestic markets, and the lack of information on domestic markets (FIP (Fruit Industry Plan), 2004). Recent years have seen a gradual increase in the level of sophistication in terms of the value chain for fruit marketed domestically with the introduction of new value chain methodologies, more sophisticated consumers and more advanced information technology (FIP, 2004).

4.3.1 Fruit South Africa (FSA)

Fruit South Africa (FSA) is an alliance of the various fruit-exporting sectors, consisting of citrus, deciduous and subtropical fruit. As such, FSA facilitated an inclusive process through which all

stakeholders are represented to develop a Fruit Industry Plan (FIP) based on the framework provided by the Sector Plan for Agriculture.

The process was directed by a steering committee consisting of commercial and emerging farmers, business partners, labour and government officials from the Department of Agriculture, the Department of Trade and Industry and NAMC (DFPT, 2008).The steering committee focused on a process to identify all the factors that impact on the three pillars contained on the Sector Plan, namely

- ➢ Equal access and participation of all
- ➢ Competitiveness and profitability
- ➢ Sustainability (DFPT, 2008)

4.3.2   Deciduous Fruit Producers' Trust (DFPT)

The DFPT is a service organisation established in October 1997 by two associations, namely the South African Apple and Pear Producers' Association (SAAPPA), the South African Stone Fruit Producers' Association (SASPA) to protect their common interests as a result of the restructuring of the deciduous fruit industry, as well as the phasing out of the Deciduous Fruit Board. DFPT therefore is an umbrella body established to handle and coordinate all matters of common concern to producers in the industry. The Trust aims to provide a cost-effective communal system that will interact with farmers to provide necessary activities such as research and development, plant improvements, certification, domestic generic promotions and general information distribution. Its priority is to collect information regarding developments, trade and market access opportunities, phytosanitary protection, production levels, and industry figures, statistics and norms. It acts as the mouthpiece of the industry and communicates with government authorities and other interest groups (Hortgro, 2012).

The DFPT represents South African fresh deciduous fruit producers to ensure a global competitive edge, and it aims to promote growth and prosperity for the wider deciduous fruit community. It works actively to promote South African produce overseas, as well as in local markets. In this regard, it manages and coordinates various special export programmes on behalf of the industry.

4.3.3   The South African Apple and Pear Producers' Association (SAAPPA)

SAAPPA was established in the early 1970s to promote and protect the interests of the apple growers and later also those of the pear growers of South Africa. The Association is a Section 21 (non-profit) company representing the eight main pome fruit production regions in South Africa. SAAPPA falls under the structure of the DFPT, the umbrella industry service organisation to which SAAPPA nominates trustees. It also is a shareholder in DFPT research, the entity that directs and guides the industry's research needs and expenditure. The main functions of SAAPPA are to rationalise and promote the production and marketing of apples and pears (and apple and pear products); to encourage and pursue constructive dialogue and mutual co-operation with government and other parties in order to promote the interests of the Association and its members; to foster mutual trust and long-term relationships among role players and stakeholders; to establish a reciprocal information system; to promote the maintenance of responsible and sustainable production and marketing practices; and to support and assist the development of its decision-making systems and structures. It facilitates, among other functions, research, communication, trade and market access, transformation and training, Black Economic Empowerment (BEE), land reform, social development projects, plant improvement, plant certification and cost surveys (Hortgro, 2012).

4.3.4   The Fresh Produce Exporters' Forum (FPEF)

The Fresh Produce Exporters' Forum (FPEF) was registered in 1998 as a non-profit industry organisation. Its membership is voluntary and open to all companies that export fresh fruit from South Africa. Whilst its membership is voluntary, strict accreditation criteria are put in place to ensure that only competent and reliable marketing agents and grower-exporters are admitted to the Forum (Hortgro, 2012).

The FPEF's mission is to create, within free-market principles and a deregulated environment, a prosperous but disciplined fruit-export sector. It was established primarily to provide leadership and services to its members and the international buying community.

The following five objectives were tabled by the FPEF's board of directors as priority areas that would best serve its constituency:

➢ To encourage the international community to use its members as the gateway to procuring South African fresh produce.

> ➤ To facilitate for its members the procurement of the right fruit from their suppliers.

> ➤ To signal to the industry – through its accreditation standards – a standard worth aspiring to for all exporters and their producers operating in the South African industry.

> ➤ To facilitate access for its members to relevant, accurate and timely generic information.

> ➤ To source funds, over and above the voluntary membership fees, so that the FPEF secretariat can perform its mandate more effectively (Hortgro, 2012).

4.4 Apple production in South Africa

South Africa has diverse weather and climatic conditions, which enables the country to cultivate a variety of fruits. The country is a globally well-known producer and exporter of apples. Western Cape Province is the major contributor to apple production in South Africa; it contributes more than 60% of the total production. This is due to its Mediterranean climate (Hortgro, 2012). The major apple-producing region is the Western Cape province are Groenland, Ceres and Villiersdorp, accounting for more than 60% of the total production in South Africa., followed by Langkloof East in the Eastern Cape, with small amounts of production in the Northern Cape, Free State, KwaZulu-Natal and Mpumalanga (Hortgro, 2012).

According to Hortgro (2012), the total production area for apples in 2012 was 22 443 hectares. Figure 4.1 below illustrates the apple production areas in hectares in 2012. Ceres was the largest production area in 2012, with 6 569 hectares, which is 29% of the total hectares of land planted in South Africa. Groenland was the second largest, with 5 795 hectares planted, accounted for 26% of total hectares under apple production in 2012. Langkloof East, with 3 971 hectares under apple production, accounted for 18% of the total hectares of apple production in South Africa, while Villiersdorp accounted for 16% of the total area planted with apples in South Africa, with 3 721 ha. The four main production regions represent 89% of the total land planted with apples in South Africa. The other areas represent 11% of the total land planted with apples in South Africa, with 2 429 hectares.

Apple production areas in hectares, 2012
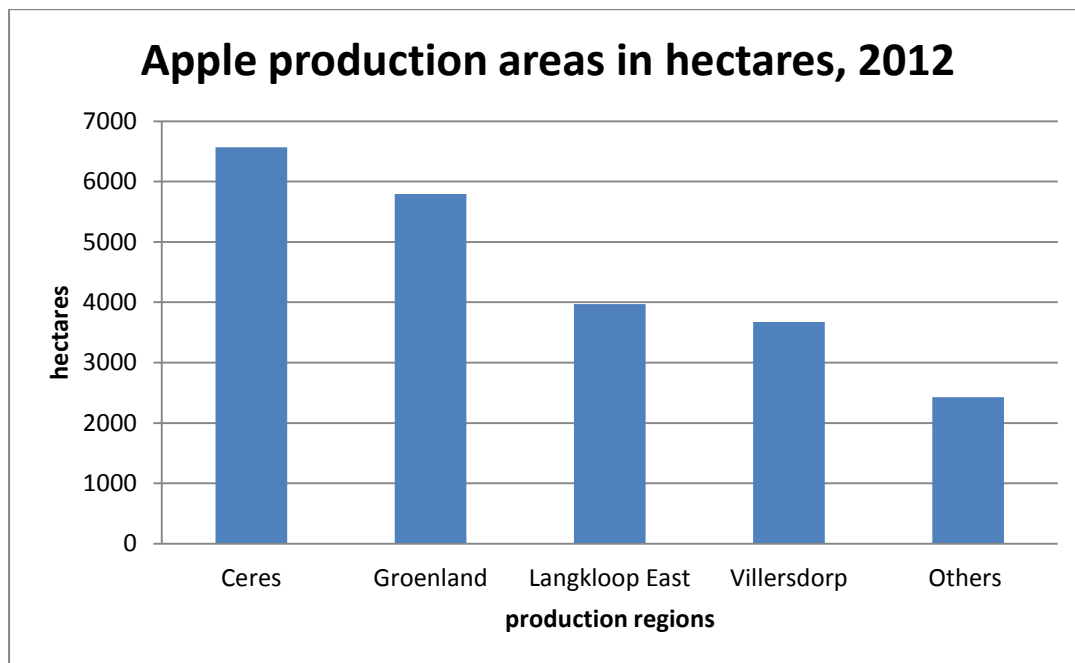
Figure 4.1 Apple production areas in hectares, 2012
Source: DAFF (2012)

The amount of apple production in South Africa has increased over the years, as can be seen in Figure 4.2 below. The figure shows the period from 1961 to 2012. There was a decline in the production of apples during the 2005 and 2006 production seasons. This was because of unfavourable weather conditions and drought in certain parts of the apple-producing areas, especially in the Western Cape, which contributes a greater percentage of apple production. The production picked up again during the 2007 production season and was on the rise from then until 2009. This was the results of many factors, but amongst others was the increase in demand from the export market, as well as improvements in apple size and the quality of the fruit. In 2010, the production of apples decreased compared to the previous year (2009). The lower production can be attributed to the effects of a heat wave that affected the production of apples in the Western Cape (Dall, 2013). The heat wave resulted in a high incidence of sunburn on the fruit, which led to a substantial proportion of the crop not meeting the minimum requirements for export and subsequently being absorbed by the local market (Hortgro, 2012). Production picked up again from 2011 to 2012.

Total production of apples from 1961-2012
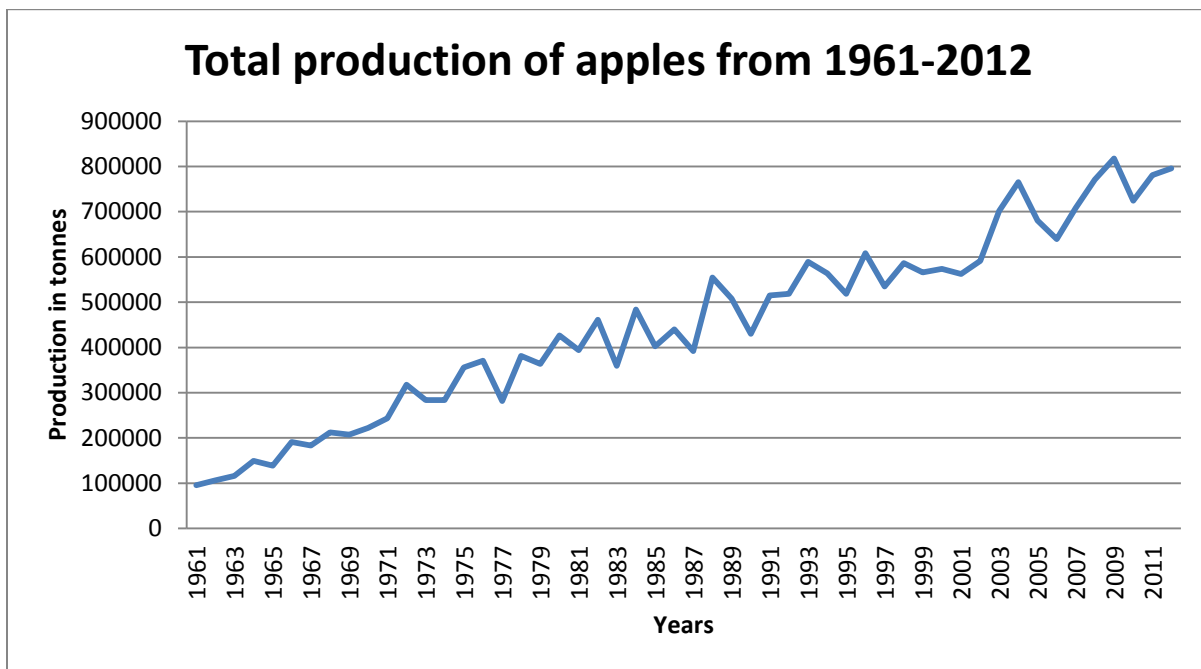
Figure 4.2 Total production of apples in South Africa from 1961 to 2012
Source FAO (2012)

4.5 Apple cultivars grown in South Africa

When it comes to apples, everyone has their favourite. Some like them crisp, some like them soft, some like them sweet, and some like them tart. Some demand "eye appeal", while others only want taste. Apples come in many colours: red, green, yellow; they also come in a number of shapes and sizes. The major apple cultivars grown in South Africa are Granny Smith, Golden Delicious, Royal Gala, Pink Lady, Fuji and Topred (Hortgro, 2012). Like most of the major producing countries, South Africa's varietal spread has changed significantly over the past years because of changes in consumer tastes and preferences. Traditionally, South Africa has been the main southern hemisphere producer of Granny Smith and Golden Delicious, which explains why these two varieties formed the core of the South African apple area, representing more than 50% of the total production (Hortgro, 2012). The Granny Smith variety remains the most popular variety and is favoured for its long shelf-life, flavour, and functionality in cooking and baking (Hortgro, 2012).

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4.6 Orchard distribution in the apple industry

The age of the tree has a strong effect on fruit quality. Young trees tend to produce good quality fruit, in contrast to fruit produced by older trees. It can be seen from table 4.1 below that 33% of South African apples orchard are older than 25 years. The two main apple cultivars in South Africa represent more than 50% of all production. The normal replacement age of most apple cultivars is around 20 years old (Conradie 2008; Hortgro, 2012).

Table 4.1 Apple orchard age distribution in 2012

Cultivar	0-3 years	4-10 years	11-15 years	16-25 years	25+ years
Golden Delicious	520	904	256	1482	2407
Granny Smith	162	357	163	622	2913
Royal Gala/ Gala	516	876	480	1458	246
Topred/ Starking	281	440	106	464	1635
Pink Lady	440	663	269	1025	24
Fuji	431	793	227	373	28
Braeburn	36	213	50	409	28
Cripp`s Red	89	155	137	132	6
Oregon Spur	0	0	13	171	53
Kanzi	138	27	0	0	0
Other	111	137	84	111	48
% of total area (ha)	11%	20%	8%	20%	33%

Source: Hortgro, 2012

Over the past five years there has been a significant restructuring in the South African apple basket. The total number of hectares planted with apples increased from 2008 to 2012, although there had been a decrease in the number of hectares planted with the main apple varieties in South Africa, namely Golden Delicious and Granny Smith, because of the changes in international consumer trends towards the consumption of bi-colour apples, which led to a trend in which new plantings were focused more on these varieties, with Royal Gala, Pink Lady and Fuji showing the most significant growth. The table 4.2 below shows the changes from 2008 to 2012.

Table 4.1 Apple cultivars planted in hectares, 2012

Cultivar	2008	2009	2010	2011	2012
Golden Delicious	520	904	256	1482	5433
Granny Smith	162	357	163	622	4475
Royal Gala/ Gala	516	876	480	1458	3431
Topred/ Starking	281	440	106	464	3061
Pink Lady	440	663	269	1025	2080
Fuji	431	793	227	373	1694
Braeburn	36	213	50	409	743
Cripp`s Red	89	155	137	132	427
Oregon Spur	0	0	13	171	245
Kanzi	138	27	0	0	113
Other	111	137	84	111	474
Total	20736	21100	21554	21920	22166
% of total area (ha)		2%	2%	2%	1%

Source: Hortgro, 2012

4.7 The market for apples

The South African apple crop is distributed across various markets, namely the fresh produce local market, the fresh produce export market, the processed foods market and the dried fruit market. The apple export market is the main marketing segment of the South African apple crop. South Africa is a relatively small apple grower in terms of global hectares. However, the country is a major volume exporter in global terms (Hortgro, 2012). South African exports of apples have grown over the past 12 years. The local market and the processed market are equally important, while the dried fruit market is relatively insignificant (Hortgro, 2012). The export and processing markets have been increasing since the 2004/2005 and 2005/2006 marketing seasons, due to changes in consumer demands for high-value products, while volumes sold in the local markets have been declining since 2004/2005. However, between 2008/2009 and 2009/2010, the quantity of apples sold in local markets increased by 21%. These are illustrated in Figure 4.3 below
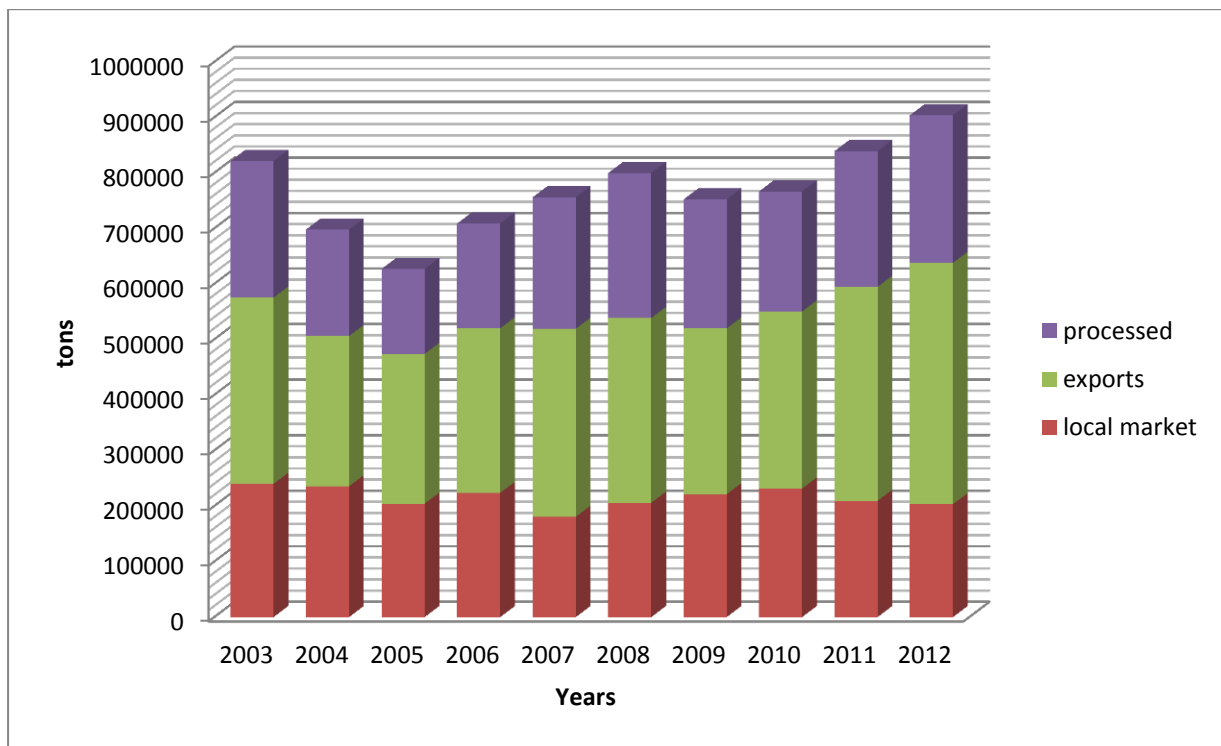
Figure 4.1 Market for South Africa apples
Source: Hortgro (2012)

4.7.1   Export market

Exports of South African apples to the various regions of the world over the past decade are presented in Figure 4.4 below. Europe has been a major destination for South Africa's exports for a long time, although the market (Europe) has been declining in the past five years. Nonetheless, the losses in this market have been captured by growth in the Asian and African markets. This means that South Africa has been exporting massive quantity of apples to Asian and African markets in the past five years. The two continents present massive opportunities for South African apple exports because of their ever-increasing populations and per capital income, and the growing consumer demand and awareness of healthy and high-value products like fruit (Hortgro, 2012)

Volumes of apples exported to the various regions

Tons

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
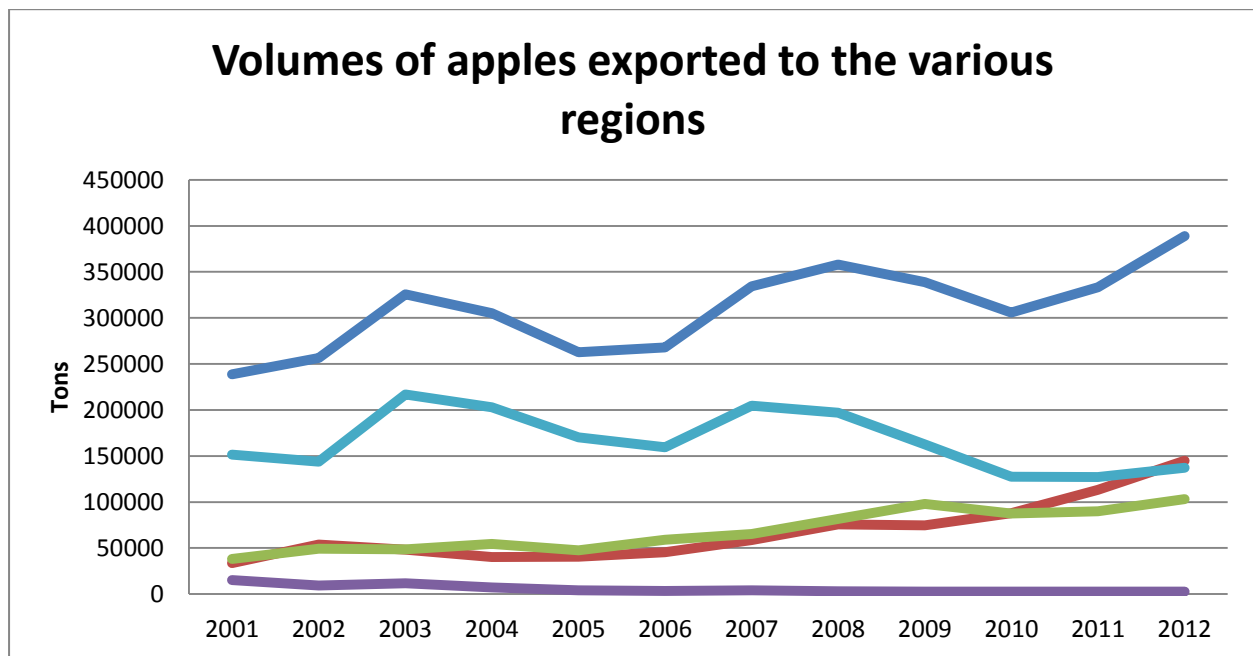
Figure 4.2 Volumes of apples exported to the various regions, 2001-2010
Source: Trade Map (2012)

4.7.2   The apple value chain

To fully understand the functioning of the SA apple industry, it is important to consider and describe the apple value chain. A value chain is defined as institutional arrangements that link producers, processors, marketers and distributors (from the farm, beyond the farm-gate right up to serving the final consumer), often separated by time and space, that progressively add value to products as they pass along the chain (Christopher, 1992; Esterhuizen, 2006).

A value chain focus on competitiveness is necessary, because one approach amongst the rest to achieve competitiveness is a closer supplier-customer relationship. It is argued that competitive advantage can be gained not just through the products sold, but also through the way in which the flows in a value chain are managed (Ajay & Nitin, 2011). Mashabela (2007) concurs that the supply chain is crucial in agriculture because it offers new ways to compete in new markets and provides previously unattainable levels of service. It is a powerful tool to achieve competitiveness and is of the utmost importance for the competitiveness of the industry. Effective, efficient and competitive supply chains improve profitability and investment. Value will be lost if the supply chain does not function in an effective and efficient manner.

Value chains have gained importance in agriculture and in other sectors for many reasons. Zuurbier and Trienekens (2000) present the following rationale for the value chain in agriculture. They state that, firstly, a value chain is needed for increased coordination so that costs are cut to

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counter intensive competition. Secondly, a value chain is needed in agriculture to mobilise all the competencies in order to introduce new products and to reduce the time to market of these products, as well as to ensure a year-round supply of products. The DAFF (2012) explains that the value chain is important in agriculture because it stabilises returns and prices and also creates the economies of scale needed for successful competitive advantage. Thirdly, a value chain is justified in agriculture because of increasing consumer interest in, and demand for, safe and healthy foods. A successful value chain takes into account the final consumers and their needs. In order for the industry to become competitive in the competitive modern economy, the entire supply chain must achieve high performance in effectively serving the needs of its customers. Therefore, industries and organisations can only survive in this global competitive environment if they are competitive enough from both a value chain as well as customer satisfaction point of view.

Any comprehensive statements on competitiveness thus should account for supply chain relations. There are several role players in the apple industry, each of which has different and specific roles in the apple value chain. This section briefly discusses the role players within the supply chain of the apple industry (as shown in figure 4.5 below), and the responsibilities of the main role players will be explained. Figure 4.5 below also provides a schematic representation of the apple value chain.

```
Research  →  Breeding  →  Plant  →  Nursery
                                       ↓
                        Production  ←  Orchard
                             ↓
                          Picking
```

Activities -

```
                   Packaging  →  Cold
                                   ↓
        Fresh local              Export
                                   ↓
Processing                 Sea freight      Airfreight
   ↓                               ↓
Wine/Spirit  Canning  Juice  Dry    Fresh produce   Retail/informal    Cold stores, terminals &
                                                                         Containerised, conventional
                    Process                              Consume         Cold stores, terminals & post
                                                                         Importer, receiver
Local              Export                                                Distribution, pre packing
                                                                         Distribution
                                                                         Shelf
                                                                         Consumer
```
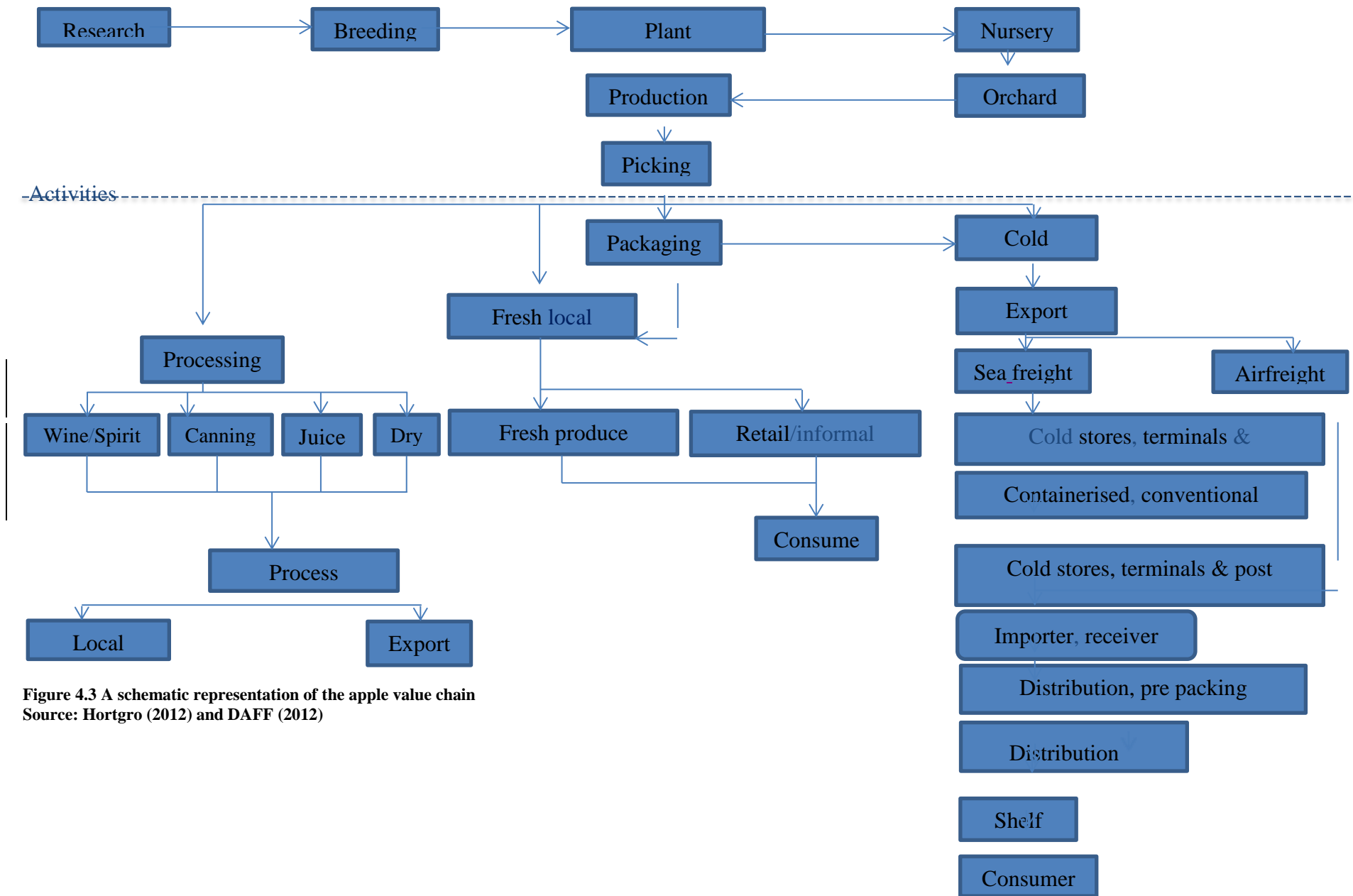
Figure 4.3 A schematic representation of the apple value chain
Source: Hortgro (2012) and DAFF (2012)

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Suppliers of inputs

Apple production requires certain specialised inputs and chemicals. Porter (1990, 1998) refers to these as related and supporting industries. Good suppliers of inputs are crucial for sustainable production and are also important where issues of traceability, environmental concerns and quality assurance are involved (DAFF, 2012).

Producers

The core role of producers is to produce a high-quality crop, as requested by the market, and where appropriate also within "Good Agricultural Practice" protocols – relating to consistency, reliability of supply and producing varieties of their products at affordable prices as demanded by consumers.

Fresh produce markets (FPMs)

FPMs are the dominant player and form of wholesaling in the South African apple and fresh fruit and vegetable (FFV) sector. However, other wholesale forms do exist, including independent wholesalers, contract buyers, supermarkets, wholesaling subsidiaries, as well as farmer sales direct to retailers and consumers.

Retailers

South African apple retailers exist in both the formal and informal sectors. The formal sector refers to formally registered retail chain supermarkets and neighbourhood stores. The informal sector covers tuck shops (*spazas*) and hawkers.

Processors

Processing of apples consists of canning, drying and juice manufacturing. There also is a set of further processors not captured in the group above. These entities use apples (and apple products) in food preparation. They include caterers, hospitality and other institutions such as corporates, and government institutions like hospitals, prisons, etc. (DAFF, 2012).

Cold storage facilities

Apples are one of the perishable products in agriculture, therefore they require storage. Cold storage operators are responsible for receiving, handling and cooling the apples to the required

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temperature, and for ensuring that the correct fruit is loaded, according to the exporter's specifications, into a truck or container that has been approved or registered by the Perishable Produce Export Control Board (Hortgro, 2012).

Consumers

Apples are commonly consumed not only because of their flavour and taste, but also because of their important nutrient content, including high levels of antioxidants, vitamins and dietary fibre. According to Ndou (2012), food trends indicate that consumers are becoming increasingly concerned about the health benefits of the food they eat. Thus there is a growing demand for foods that improve health, protect against disease, influence mood, promote weight loss and slow ageing. In addition, busy consumer lifestyles promote the demand for convenience foods; globalisation causes growth in the demand for novelty foods; and consumers are becoming more concerned about the impact of food production systems on the environment and society.

According to Hughes, 2004, as apples are naturally healthy and lend themselves to a variety of snacking options, the industry is well positioned to capitalise on these trends. In recent years, a number of studies confirmed the relationship between the consumption of fruits and specific health benefits. Specific elements within fruit, such as antioxidants and certain well-known vitamins, have been identified as beneficial in helping to prevent the incidence of certain health problems and illness. However, what is less well known is that apples are a potent source of powerful antioxidants plus other protective plant compounds, with epidemiological studies linking their consumption with a reduced risk of some cancers, cardiovascular disease, asthma, and diabetes 2. Apples are one of the very few individual foods specifically identified in population studies as having the capacity to reduce the risk of cancer and, more specifically, that of lung cancer. Therefore there are endless opportunities to increase the demand for apples by differentiating it according to its health benefits. To increase the demand it has been proven that consumers need to be influenced to alter their behaviour (APAL, 2008).

4.8 The South African deciduous fruit industry's contribution to the economy

Apples are one of the most important deciduous fruits grown in South Africa because of their contribution to foreign exchange earnings, domestic consumption and employment. The industry is highly important to the economy of South Africa, specifically to that of Western Cape province

as the heart of apple production (FIP, 2004).The agricultural sector is an important component of the South African economy, with the deciduous fruit industry being the most important sector of the horticultural industry by gross value, contributing more than 28,7% of the total gross value of the sector. During 2001/2002, deciduous fruit contributed approximately 29% to the gross value of horticultural products, with apples making a greater contribution as they constitute the bulk of deciduous fruit produced in South Africa. For example, in 2000, apples made up the largest percentage of the deciduous fruit crop (43%). During the 2009/2010 season, apples contributed approximately 34% (R2.9 billion) of the total gross value of deciduous fruits (R8.8 billion) in South Africa (DAFF, 2012). However, the agricultural sector only contributes less than 4% of the country's GDP. This smaller contribution of the agricultural sector does not mean that the sector is declining in absolute terms; it rather is an indication that the services sectors are growing faster (Vink & Van Rooyen, 2008).

Deciduous fruit is an export-driven industry, exporting most of its fruit to international markets and, in the process, earning more than R4.6 billion per annum. The foreign exchange earned by the industry's exports is important to South Africa as a developing country. The apple industry also contributes to the economy through employment; the industry employs people full time and part time for various responsibilities or tasks.. According to Mashabela (2007), full-time labourers employed on apple farms are primarily employed for a number of specialist tasks such as the pruning of trees. Labour is also required to carry out thinning practices during blooming or during the first four weeks of fruit growth. Other tasks include harvesting, supervision, operational duties in the pack house, irrigation management, scouting for insects and diseases on a seasonal basis, tractor or forklift driving, and grafting. Seasonal labour is employed on a contractual basis for a fixed period of time with the main purpose of harvesting or fruit packing. The prescribed minimum wage is used as a baseline for determining basic wages in accordance with the legislation governing conditions of service (Beukes, 2009). The minimum wage is currently R105 per day. The industry makes an important contribution to direct employment in apple production and processing. It provides indirect employment for numerous support industries in the areas where apples are grown. In 2010, direct employment within the industry was estimated at 27 033 people with 108 131 dependents. This represented a 4.5% increase in the number of people employed in the apple industry from 2009 to 2010 (DAFF, 2012).

4.9 Concluding remarks

The purpose of this chapter was to provide an overview of the South African apple industry. The chapter provides an overview of the industry, with a special emphasis on its historical background and value chain structure, and the contribution of the industry to the economy, and to global and local production trends.

As discussed in this chapter, there have been structural changes that took place in the apple industry over the years, and they affected the quantities of apples produced, processed into apple juice over the years. Despite the changes in the business environment, the South African apple industry has managed to keep quantities of apples exported to the international markets. The industry has managed to cope with competition and challenges to some degree.

CHAPTER 5: RESULTS AND FINDINGS

5.1 Introduction

This chapter provides the definition of competitiveness and discusses the results and findings of the competitive performance analysis of the SA apple industry in terms of the first four steps of the "five-step" framework of analysis used in this study. Step 5 will be discussed in the next chapter, as it extends the empirical and quantitative analysis in Steps 2 to 4 and only proposes pointers for consideration in a comprehensive industry strategy.

5.2 Definition confirmed (Step 1)

The competitiveness analysis in this study is directed by defining it as "the ability of an industry (apple industry) to trade its products successfully in order to achieve sustainable business growth within the global environment, while earning at least the opportunity cost of returns on resources employed" (Esterhuizen, 2006; Freebairn, 1986). This definition allows a comprehensive approach to the issue of competitiveness performance and considers trade as a key element of the measurement of such performance. This definition was also confirmed with industry representatives during the focus group sessions.

5.3 Measurements (Step 2)

The second step of the methodology was to measure the competitiveness of the apple industry in South Africa. After consideration of various measures that can be used to measure the competitiveness of the South African apple industry comprehensively in the context of the global environment in which it operates, as most of the crop is exported, the RCA, NXI and RTA measures were selected. As the trade in fresh apples is dominant, the trade data of this category of apples was used in the various calculations.

Competitiveness based on trade performance is measured by the application of the RCA, NXI and RTA formulae. In this quantitative method, it is argued that competitive advantage could be indicated by the trade performance of 'traded' individual commodities, value chains and countries in the sense that a commodity's trade pattern reflects relative market costs as well as differences in non-price competitive factors, such as subsidies, government policies and other public support measures, i.e. the true cost of doing business by trading a commodity. The measures selected in this study therefore allow for the measurement of competitiveness under

real-world trade situations and also for including the realities of 'uneven economic playing fields' due to distorted economic policies and different trade regimes (Esterhuizen, 2006). RTA is the most appropriate methodology to measure the competitiveness of the industry that is why it is used in this study, The RCA# and NXI methodologies are only partial measures of the competitive status of an industry.

These measures thus support the above definition of competitiveness; to measure how competitively the apple industry in South Africa performed, it is necessary to determine how successfully the industry traded its products in the local and global environment over time relative to its competitors. This approach considers trade performance, i.e. the ability to continue to trade in a competitive global environment.

5.3.1   Relative Comparative Advantage (RCA)

Table 5.1 below shows the RCA values for the SA apple industry from 1961 to 2012. The trend is shown in Figure 5.1. All the values are above 1, with most of the values being close to 10; this shows that South Africa has shown a good comparative advantage in the production of apples, with the years from 1966 to 1973 in particular showing strong comparative advantage ratings – in general, thus, a sustained competitiveness performance.

Table 5.1 RCA index of South African apples from 1961 to 2012

Years	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
RCA	5.23	6.11	7.41	9.62	8.2	11.71	10	13.91	10.61	13.43	13.11	14.53	10.22
Years	**1974**	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**
RCA	6.44	5.78	9.37	3.57	6.52	5.17	4.85	5.61	7.85	5.09	8.68	5.67	4.23
Years	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
RCA	5.53	3.23	5.79	6.05	8.05	10.46	9.79	5.29	7.18	5.27	7.36	9.54	8.26
Years	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
RCA	6.32	6.46	8.97	8.06	9.97	8.86	8.29	9.67	8.03	8.96	8.52	8.14	9.79

Source: Own calculation based on data from FAOSTAT (2012)

Figure 5.1 Comparative advantage trends of the South African apple industry based on RCA calculations (1961 to 2012)
Source: Own calculations based on the data from FAOSTAT (2012)

5.3.2 Net Export index (NXi)

In Table 5.2 and Figure 5.2, the NXi index for apples is given. As mentioned in Chapter 3, an upper limit of 100 indicates no imports and a lower limit of negative 100 indicates no exports. The South African apple industry shows a positive net export value performance for the whole period, with values mostly close to 100. This indicates that South Africa is a net exporter of apples. The NXi shows no difference from the RCA index, with both telling the same story – that the apple industry is experiencing a sustained comparative advantage.

Table 5.2 NXI of the South African apple industry from 1961 to 2012

Years	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
NXI	99.79	99.97	99.52	99.56	99.5	99.36	99.8	99.9	100	100	100	100	99.96
Years	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
NXI	99.9	99.56	99.65	99.97	99.4	99.63	99.72	99.49	99.61	99.93	99.61	99.93	99.85
Years	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
NXI	99.62	99.97	100	100	100	98.15	100	100	100	100	100	97.17	100
Years	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
NXI	100	100	100	99.93	100	100	99.97	99.88	99.93	99.83	99.69	99.88	99.88

Source: Own calculation based on the data from FAOSTAT 2012

Figure 5.2 Comparative advantage trends of the South African apple industry based on NXI calculations (1961 to 2012).
Source: Own calculations based on the data from FAOSTAT (2012)

5.3.3   Relative Trade Advantage (RTA)

Competitiveness performance trends for the apple industry in South Africa, as measured by the Relative Trade Advantage (RTA), are shown below in Table 5.3 and figure 5.3. It can be seen that the RTA index values are mostly positive, with values mostly around a value of 8 over the past decade and increasing to just less than 10 in recent years. This indicates that the South African apple industry performed competitively in the global market and has sustained such performance since 1961, with the period from 1966 to 1973 being relatively higher than the other years and with a gradually increasing trend again over recent years.

Table 5.3 RTA values of the South African apple industry from 1961 to 2012

Years	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
RTA	5.23	6.11	7.41	9.62	8.2	11.71	10	13.91	10.61	13.43	13.11	14.53	10.22
Years	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
RTA	6.44	5.78	9.37	3.57	6.52	5.17	4.85	5.61	7.85	5.09	8.68	5.67	4.23
Years	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
RTA	5.53	3.23	5.79	6.05	8.05	10.46	9.79	5.29	7.18	5.27	7.36	9.54	8.26
Years	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
RTA	6.32	6.46	8.97	8.06	9.97	8.86	8.29	9.67	8.03	8.96	8.52	8.14	9.79

Source: Own calculation based on the data from FAOSTAT 2012

5.4 The trends in the competitiveness performance of the South African apple industry

Figure 5.3 below shows the trends in the competitiveness of the apple industry from 1961 until 2012. It can be seen from the graph that the competitiveness of South African apples varies quite considerably through the years; these variations, however, can be grouped into four stages or phases, depicting certain trends in performance. From discussions with industry representatives, the focus groups and interviews with experienced producers, four phases can be distinguished in the competitive performance of the industry. These stages are discussed below.
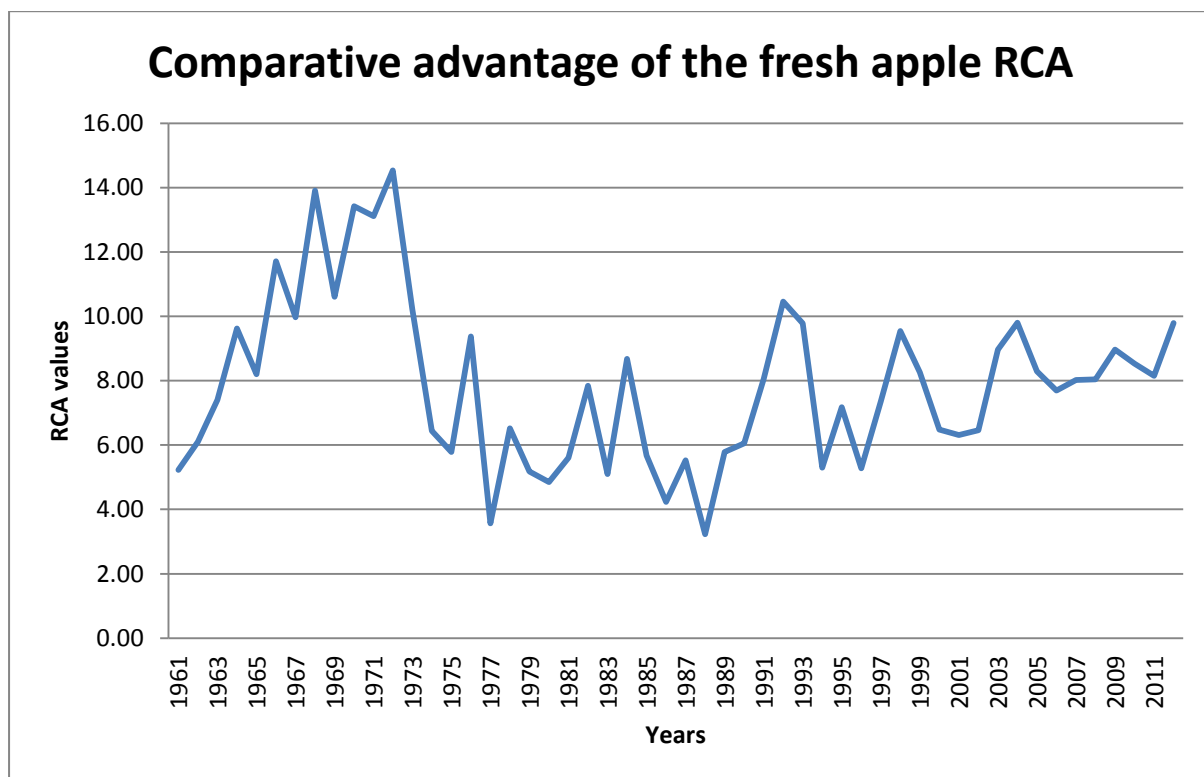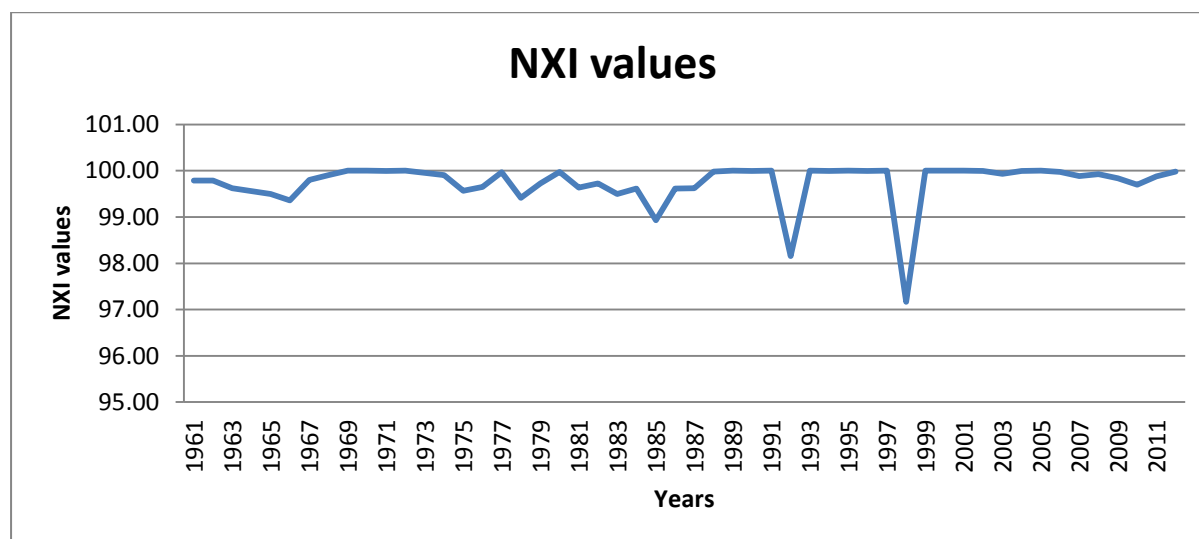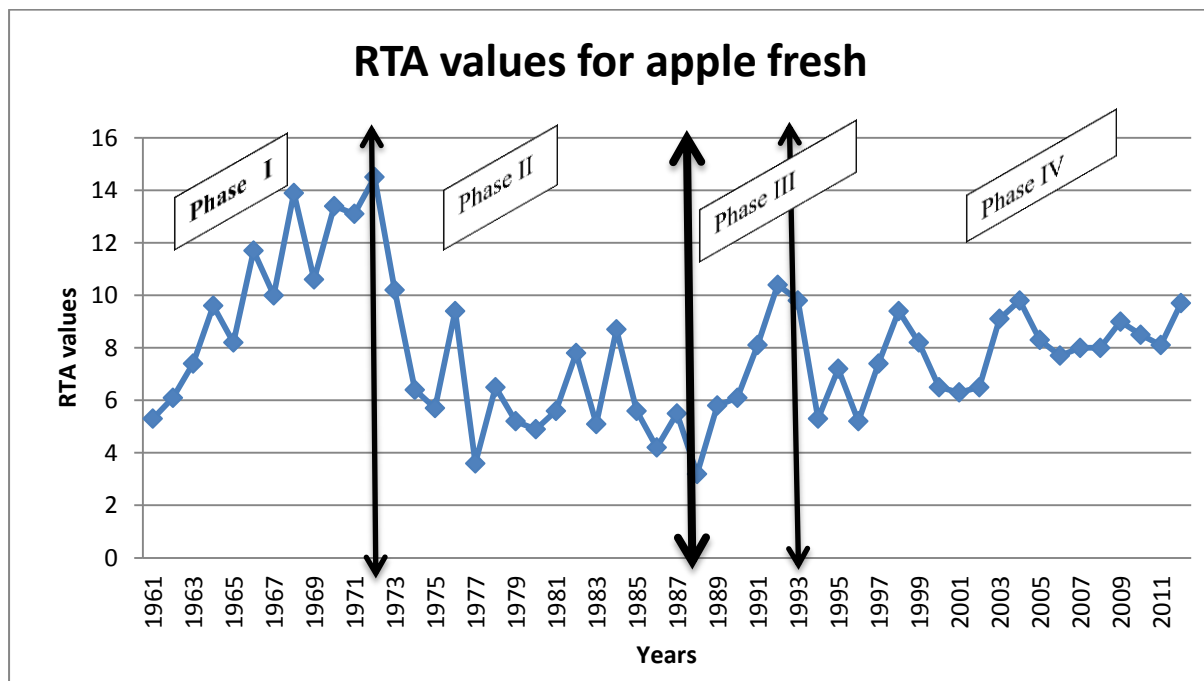

Figure 5.3 Competitive trends of the South African apple industry based on RTA calculations (1961 to 2012)

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Source: Own calculations based on the data from FAOSTAT (2012)

Phase 1: Protective competition

In phase one, from the 1961 to 1972, the South African apple industry was increasingly competitive, reaching a high of 14.55 in 1972. Prior to the 1960s, South Africa was a member of the British Commonwealth, but it left the Commonwealth in 1961 and became a republic. However, the preferential status of exports to the United Kingdom continued (Du Toit, 2000). As a result, South Africa had an advantage over Southern Hemisphere, non-commonwealth apple-producing countries, because it had tariff advantages over its competitors (Du Toit, 1981).

Another reason for the relative competitiveness of the apple industry was relatively low interest rates and low inflation, promoting investment. Historically, South Africa's inflation rate was tied closely to that of its major trading partners. In the 1960s, annual inflation averaged about 3%. Furthermore, South African policies played a major role; the country was still supporting its farmers through various forms of subsidies and protection at that time, including "low" interest rates through the cooperative movement and the Land Bank (Du Toit, 2000). In this phase, the South African apple industry was relatively more competitive because some of the highly competitive countries of today were not yet operational in the global market, for example Chile and New Zeeland, the current leaders. The competition from Southern Hemisphere exports was relatively limited (Du Toit, 1981).

In addition, the quality demands were not highly stringent, fruit size was not a major issue, consumers were generally satisfied with a limited cultivar mix, and fruit colour was of lesser importance in contrast to what it is today – the market was "easier than today" (Dall, 2013).

Phase 2: Declining competitiveness due to economic and political sanctions

Phase 2 was the period from 1973 to 1988. This was the period of increasing economic and political sanctions, increasing political pressure on South Africa by the international community during the 1980s, and the imposing of "anti-apartheid" trade sanctions. This brought the agricultural export industry almost to a standstill by restricting its access to international markets (Du Toit, 2000), resulting in a huge drop in the competitiveness of the industry. South Africa lost markets, for example the American market, due to sanctions. This strongly constrained SA's ability to compete successfully in the international markets (Dall, 2013).

Interest rates and inflation were also on the rise by that time, as inflation rose from about 3% in the 1960s to over 10% in 1974, and fluctuated between 11% and 14% through the early 1980s. During the late 1980s, however, South Africa's inflation rate did not decline along with those of its Western trading partners. Inflation reached a high of 18.6% in 1986 (Du Toit, 2000; Ndou, 2012).

Competition from the Southern Hemisphere, one of the world's market leaders in producing and exporting apples, increased during this period. Chile appeared on the global market in 1974 and its government heavily subsidised the farmers, who also enjoyed the benefits of good climatic conditions, water and superior soils that contribute to good quality fruit (Dall, 2013, Mashabela, 2007).

There also were serious droughts in the apple-producing areas during this phase – in 1973/1974, 1978/1979, 1983/1984 and 1984/1985 – which led to decreases in the level of production and lower quality of apples, which adversely affected the competitiveness of the industry (Mashabela, 2007).

Phase 3: Political reforms and fluctuating competitiveness

Phase three, from 1989 to 1993, saw a large increase in the competitiveness of the apple industry with the release of Nelson "Madiba" Mandela in 1990 and the subsequent political liberation of South African society. As a result, the apple industry went through a remarkable period of activity and transformation. Economic sanctions were lifted in the early 1990s, leading to international business exposure, access to international markets, interaction with trade supply chains and increased investments (Dall, 2013; Hortgro working group, 2013). Kirsten (1999) concur that the general level of investment in South African agriculture was relatively high throughout the 1990s, and substantially higher than the period before 1990. There is a positive relationship between investment and the competitiveness of an industry (Narula and Wakelin (1998).

The period from 1992 was the start of the sharp and continuous decrease in the value of the Rand against the US$. The devaluation of the Rand plays a crucial role in making the prices of South African products more competitive. (Ndou, 2012).

Phase 4: Gradual increasing competitiveness

Phase four is from 1994 to the present, and presents a sustained, gradually increasing competitive performance after an initial shock decline from 1993 to 1995. The deregulation of agricultural markets took place during this period and this, understandably, initially had a negative impact, for example due to "market and agent confusions" (Dall, 2013; Du Toit, 2000; Vink, 2003). As was shown in Chapter 4 of this study, the production of apples was high during this period and the changing trade environment opened up new opportunities, resulting in an increase in the export of South African apples to international markets.

After the initial impact, deregulation in general had a positive effect on the competitiveness of the industry, as explained in Chapter 3. Fluctuations were also recorded over this period, although the trend generally appears to be increasing – from below 7 from 1994 to 1997, to just below 10 in the period from 2010 to 2012. These fluctuations can be explained partly by new and increasing "regulations" in the international markets, to which the SA industry had to conform. Some of these related to changing consumer concerns about the health of products, with the EU market, which is the main export market for South Africa, becoming more stringent in terms of quality and food safety. Producers supplying the EU market thus have to meet increasingly stringent technical and environmental standards, as the market requires compliance with external certification of standards, particularly EUREPGAP and HACCP, which cover production and environmental standards, as well as their own standards (Ndou, 2012). Such adaptations took time to install the necessary changes and certifications (Dall, 2013)

The financial crisis from 2007 to 2009, leading to 'economic meltdown', also contributed to the fluctuations in the competitiveness of the apple industry. This crisis resulted in the threat of total collapse of large financial institutions, the bailout of banks by national governments, and downturns in stock markets around the world. The crisis played a significant role in the failure of key businesses, declines in consumer wealth and a downturn in economic activities.

5.4.1   Comparison with other countries

The main drive of this study was to establish the competitive performance of the South African apple industry in the global environment. Therefore a view of the competitive performance of the South African apple industry, as measured by the RTA, in comparison with some other major apple-trading economies, is instructive. It will give an overview of how South Africa is rated

with regards to competitiveness in the apple industry in the global environment. RTA methodology allows for comparison between countries because it is a ratio that measures the exports and imports of a country relative to what the world exports or imports in terms of the product in question. RTA methodology captures market distortions and the size of the economy, that is why it is acceptable to compare RTA between countries.

Chile is one of the biggest apple producers in the Southern hemisphere and is one of South Africa's major competitors in trade in apple fruit. Argentina, the Netherlands, Italy, Brazil, France, China, the United States of America, New Zealand and Poland are also competitors of the South African apple industry. The study measured this performance from the period between 1990 (base year) and 2012 against South Africa's major competitors; this period also includes the period just before the deregulation of the SA industry until the present. Figure 5.4 shows the competitiveness of the South African apple industry versus its major competitors in the industry.
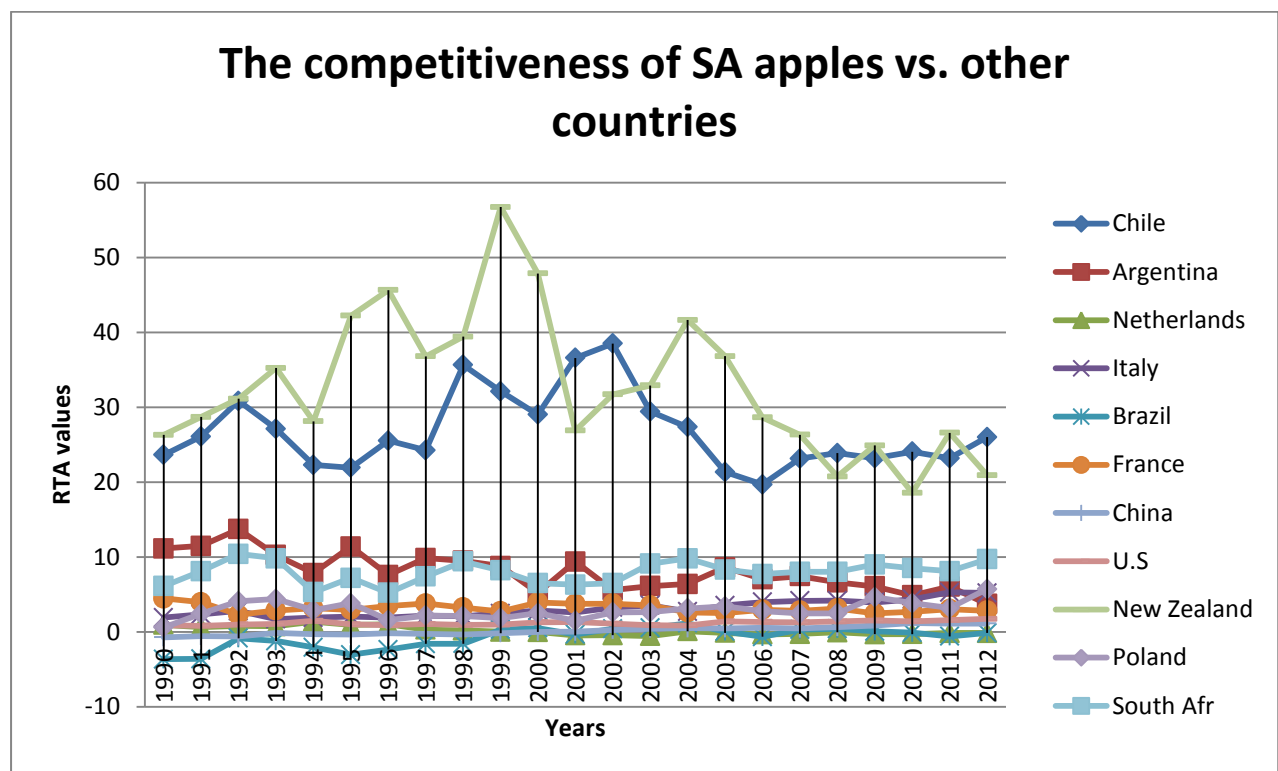
Figure 5.4 Competitive status of the South African apple industry vs. other major apple-producing countries from 1990 to 2012
Source: Own calculation based on the data from FAOSTAT (2012)

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From the graph, RTA index values for Chile and New Zealand show that these two countries have the strongest and globally most competitive status in apples. Their RTA values are consistently much higher than all other countries. South Africa, Italy, Argentina, France, Poland, China and the United States of America are generally competitive, with South Africa rated better than the rest, i.e. fairly consistently in third position 'on the apple podium', with Argentina the most consistent competitor. The apple industry in the Netherlands and Brazil is internationally uncompetitive. Most other countries, however, are challenging the SA position and strong directives and strategies will be required to upgrade SA's performance in the future (refer to Step 5 in Chapter 6 for a discussion on this).

5.4.2   The competitiveness of the SA apple value chain

According to Wentzel (1996, as cited in Van Rooyen, 1998), agricultural products can be highly competitive in their primary form, while further processing or value adding to these products show a reduced level of competitiveness. This has been observed for maize (unmilled) when processed as animal feed. In 1998, Van Rooyen analysed the competitiveness of the flower industry in South Africa and concluded that wild flowers and foliage production were highly competitive, while house plants and cut flowers were less competitive. Esterhuizen (2006) performed a comprehensive analysis of most of South Africa's agricultural commodities and found that the competitiveness of many agricultural commodities such as grapes, apricots, nectarines, plums etc. declined as they were processed or value added, meaning the primary form of an agricultural product will have greater competitiveness than when it is processed. Mosoma (2004) also found this to be true, as his analysis shows that there was a general tendency in South Africa and in other members of the Cairns Group's food chains to decrease in competitiveness when moving from the primary to the processed products. This trend was again confirmed recently for the South African agri-value chain by Van Rooyen *et.al* (2011). This implies that value-adding opportunities are constraining. In the case of South Africa, this has been attributed to uncompetitive behaviour and high transformation/value-adding costs, combined with low productivity in value adding, poor business strategies and inefficiencies (DAFF, 2012).

This study, however, did not explore the value-add environment in detail and refers only briefly to the apple juice value-add activity in the industry. A comment to this effect will be made in the concluding chapter in the discussion of future research that is required. Table 5.4 below presents the RTA values for apple juice.

Table 5.4 The competitiveness status of the South African apple juice industry

Years	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
RTA	16.18	12.89	13.87	9.63	15.9	19.97	8.67	15.48	12.33	13.27
Years	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
RTA	10.06	7.89	7.89	12.28	3.68	10.91	10.26	8.13	1.96	3.34
Years	2004	2005	2006	2007	2008	2009	2010	2011	2012	
RTA	3.89	0.95	1.16	-2.69	-1.9	1.15	1.16	2.25	3.56	

Source: Own calculation based on the data from FAOSTAT (2011)

Data for apple juice exports and imports was not available from 1961 to 1983. The apple juice industry started off as highly competitive, exceeding the competitiveness of fresh apples. The reason for this, as explained by the FAO, is that, during the early 1980s, the value of world trade in processed agricultural products grew more quickly than trade in primary agricultural products. Exports of processed agricultural products grew 6% per year during the period 1981 to 2000, compared with 3.3% for primary products. As a result, the share of processed products in total agricultural trade increased from 60% in 1981 to 1990 to 66% in 1991 to 2000 (FAO, 2004). Growth rates have been exceptionally high (above the average of 6%) for the processed forms of cereals, fruit, vegetables, pulses, tropical beverages and poultry products.This is in line with the finding of Vink (2002), who concluded that exports of processed foods and beverages have shown strong growth in the post-apartheid and liberalisation era. Indeed, the export value of certain processed food and beverages, such as sugar, wine, non-alcoholic beverages, butter, chocolate products, fresh fruit, fruit juice, including apple, fresh vegetables, frozen vegetables and prepared vegetables, has increased or grown tremendously. This clearly explains the high levels recorded until the late 1980s.
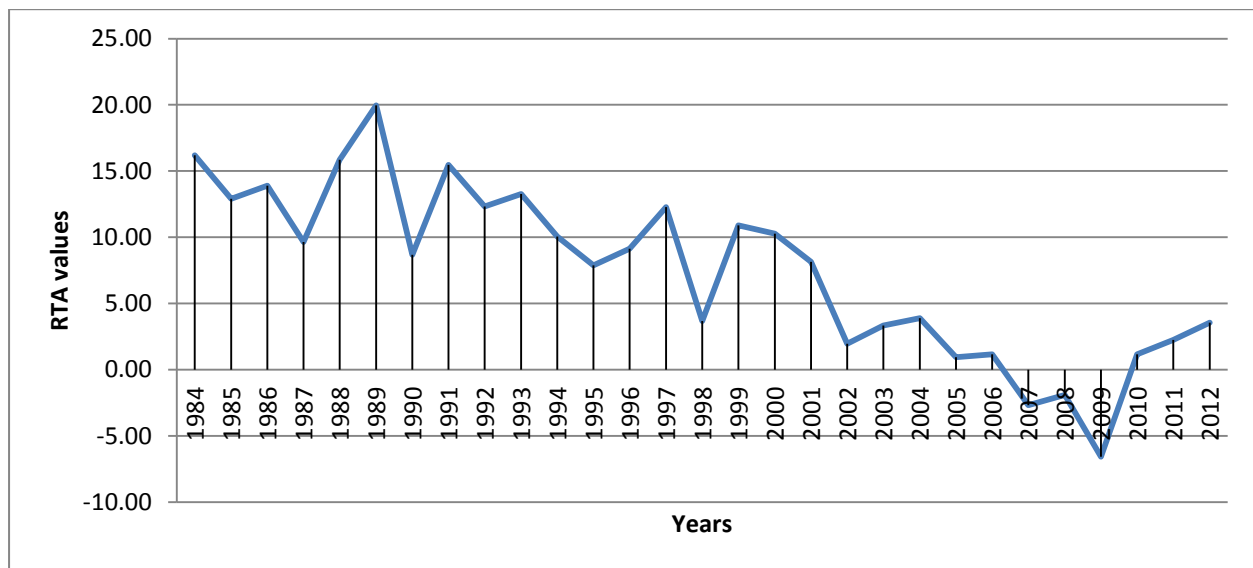
Figure 5.5 Competitive trends in the South African apple juice industry based on RTA calculations (1961 to 2012)
Source: Own calculations based on the data from FAOSTAT (2012)

From Figure 5.5 above, it is clear that the SA apple juice industry was strongly competitive from 1984 to 1994, although fluctuating. The competitiveness of apple juice decreased from 1995 onwards, from being strongly competitive to becoming uncompetitive after 2006. One of the reasons for a decrease in competitiveness of apple juice in South Africa was a lack of processing capacity at critical times during the year (Dall, 2013). According to Vink (2002), the apple industry was adversely affected by the deregulation and experienced a decline in exports in the period immediately after deregulation, in the mid to late 1990s. It was for this reason that the value of apple juice started to decline. In addition, China recently entered the global market and delivers apple juice much cheaper than South Africa; China is now the main exporter of apple juice in the world. Therefore it is cheaper for South Africa to import juice than produce it. From 2007 to 2009, South African apple juice was not competitive, with RTA values being less than 1, and this can be attributed to the decrease in the number of apples being processed to apple juice. The competitiveness started to pick up after 2009 in 2010, 2011 and 2012 this was due to the increase in production of apples, percentage of processed apples into apple juice as a result of increase in the demand for ciders (Hortgro, 2012), together with the reduction in the currency value of the South African Rand.

5.5 Identifying the factors of competitiveness in the SA apple industry (Step 3)

5.5.1 Factors of competitiveness

The competitive performance of the SA apple industry since 1961 was measured in the previous section. Step 3 of the analysis will be attended to in this section and seeks to identity the factors that determine the competitive performance. Information gathered from the Apple Executive Survey (AES), supported by focus group sessions and personal interviews, were used. Identifying, rating and listing such factors will assist the industry to better understand its position in global markets, analyse the important factors and plan ahead.

This section also provides input for grouping such factors as the major determinants for analysis in the Porter Model. This will support industry stakeholders to develop strategic approaches to ensure the industry's sustainability. Factors that were identified by the AES are shown in the table 5.6 below with their mean values as rated in the AES. Ratings were made of the responses by 61 executive-level individuals participating in the apple industry, who were requested to classify the enhancing factors (ratings from 4, enhancing to 5, highly enhancing), constraining factors (ratings of 1, as highly constraining and 2, less constraining) or neutral factors (rating of 3) in terms of their impact on competitiveness. These factors were then structured in the table below according to the Porter Determinants Model, viz. factor conditions; demand conditions; related and supporting industries; firm strategy, structure and rivalry; government support and policy; and chance factors.

Table 5.5 The Porter Determinants Model - Descriptive statistics of the executive survey in the apple industry in South Africa 2012/2013.)

Factor conditions	Rating*
Availability of skilled labour	1.6
Quality of skilled labour	2.1
Cost of skilled labour	2.1
Availability of lowskilled labour	4.54
Quality of lowskilled labour	1.52
Cost of lowskilled labour	2.5
Cost of capital	2
Availability of capital	3
Quality of infrastructure	4.02
Cost of infrastructure	1.6
Availability of technology	3.5
Quality of technology	3.5
Cost of infrastructure	2.3
Weather conditions	3
Water availability	3
Soils condition	2.7
Overall mean for factor conditions	**2.07**
Demand conditions	
Local size market	3.65
Local buyers	3.73
Growth in local market	3.59
Growth in the International market	5
Overall mean for demand conditions	**4.01**
Related and supporting industries:	
Financial services	3.4
Availability of scientific research institution	3.5
Collaboration of scientific research institution	3.8
Electricity supplies	2
Telecommunication firms	2.6
Specialised technology services	3.6
Availability local suppliers of primary inputs	3.8
Quality of local suppliers of primary inputs	3.6
Sustainability of local suppliers of primary inputs	3.5
Availability of storage facilities transport	3.8
Cost of Storage facilities	2.3
Availability of transport	4.5
Overall mean for related and supporting industries	**4.15**
Firm strategy, structure and rivalry:	
Industry`s spending on R&D	4.4
Flow of information from supplies to industry	4.01
Flow of information from customers to industry	4
Competition in local market	4.45
Entry of new competitors	3.2
Competition in international market	4.2
Overall mean for firm strategy, structure and rivalry	**4.5**
Government support and policy:	

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SA trade policy	2.3
SA land reform policy	2.1
SA labour policy	1.6
SA macroeconomic policy	2.5
SA competition law	4.1
SA BEE policy	2.4
Trust in the political system	1.8
Regulatory standards	4
Administrative regulations	1.8
Tax system	2.4
Political change affected planning	2.3
Environmental regulations	2.5
Complying with environmental regulation	4
Overall mean for government support and policy	**2.39**
Chance factors:	
Cost of Crime	1.56
Health (HIV/Aids)	2
Economic development and growth	2.9
Exchange rate	2.5
Overall mean for chance factors	**2.24**

Source: Own calculation based on the Apple Executive Survey (2012
* Ratings: from 1 as highly constraining to 5 as highly enhancing, with 3 as neutral

5.5.2   Constraining factors

In Table 5.5 above, the factors constraining and enhancing the competitiveness of the South African apple industry are indicated and grouped in the Porter Model determinants. These factors are rated according to their averages and the top most constraining and enhancing factors are listed.

Major constraints: Quality of low-skilled labour, cost of crime, availability of skilled labour, cost of infrastructure, SA labour policy, administrative regulations, trust in the political system and many of the government policies are among the major factors constraining the competitiveness of the apple industry in South Africa. These factors are tabled below. Most of these factors are beyond the control or influence of single firms; they rather fall in the arena of industry and government interaction. Even the quality of skilled labour cannot be dealt with at firm level only; a more coordinated industry and industry-government actions will be required. These will be attended to in Chapter 6 as part of Step 5 of the analysis.

Table 5.6 Top ten major factors that constrain the competitiveness of the South African apple industry

Factors	Mean
Quality of unskilled labour	1.52
Cost of crime	1.56
Availability of skilled labour	1.6
SA labour policy	1.6
Cost of infrastructure	1.6
Trust in the politicians	1.8
Administrative regulation	1.8
Health (HIV/Aids)	2
Cost of capital	2
SA land reform policy	2.1

Source: Apple Executive Survey (2012)

5.5.3   Enhancing factors

As was done for the constraining factors in the apple industry, success factors were also analysed. The information contained in Table 5.7 below, which is drawn from Table 5.6, shows the most important factors influencing the competitive success of the South African apple industry.

Enhancing factors: Competition in the international market, availability of low-skilled labour, availability of transport, intense competition, both in the local and international market, and the industry's expenditure on R&D. Strong industry-level action will be required to deal coherently with these factors to ensure their enhancing status.

Table 5.7 The top ten enhancing factors in the competitiveness of the South African apple industry.

Enhancing Factors	Mean
Competition in the international market	5
Availability of unskilled labour	4.54
Availability of transport	4.5
Competition in local markets	4.45
Industry's expenditure on R&D	4.4
Quality of infrastructure	4.3
Availability of storage facilities	4.23
SA competition law	4.1
Flow of information from suppliers to industry	4.01
Flow of information from customers to industry	4

Source: Apple Executive Survey (2012)

5.6 Determinants of competitiveness in the South Africa apple industry (Step 4)

In Step 4 of the analysis of competitive performance, the factors identified and rated by the AES were grouped together as determinants according to the Porter Model and analysed in terms of enhancing or constraining the performance of the industry. The grouping of factors into determinants was done in Table 5.6 above. These are now analysed further as the six determinants of competitiveness (Porter, 1990).

5.6.1   Factor conditions

The cost of doing business as a factor condition in this study was indicated by the respondents as a constraining factor in the competitiveness of the apple industry. This constraining impact indicates that the apple industry requires major start-up costs (Hortgro working group, 2013. However, the use of machinery and tractors would enhance productivity. However, the high cost of acquiring technology is identified as a major constraint to the industry's competitive position (2/5). The declining value of the Rand also contributes to such costs because machinery has to be imported.

Factor conditions that enhance the competitiveness of the South African apple industry, as determined by the respondents, included the availability of low-skilled labour (4.54). Low-skilled labour is readily available for the apple industry because the jobs performed by these types of labourers can be done by almost all able- bodied people who have reached a legal working age (Mashabela, 2007). In theory, a high supply of low-skilled labour would make low-skilled labour less costly, although the respondents indicated that the cost of low-skilled labour is starting to constrain the competitiveness of the apple industry (2.5/5). This is because of minimum wage legislation and low productivity in the apple industry. The minimum wage is set at R105 per day.

The AES respondents also indicated that the weather/climate was one of the enhancers of the competitiveness of the South African apple industry. The weather conditions in the Western Cape generally are viewed as favourable for the production of most fruit, including apples, as it is the main apple-producing region in South Africa.

Another critical factor condition indicated by the AES respondents as an enhancement to the competitiveness of the industry was the general infrastructure used by the apple industry (4/5).

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Like any other agricultural industry, the apple industry requires an acceptable standard of infrastructure, such as roads to transport their products to the market, telecommunications, and water supplies for efficient and proper functioning of their business. However, the respondents expressed concern about the increasing cost of infrastructure.

Figure 5.6 below illustrates the ratings of all the factor conditions identified by the AES as determining the competitiveness of the South African apple industry.

Figure 5.6 Factor conditions determining the competitiveness of the South African apple industry
Source: Apple Executive Survey (2012)
Ratings: 1 = highly constraining; 3 = neutral; 5 = highly enhancing

As shown in Table 5.6 above, the average score for the factor conditions determinant is 2.07 out of 5, which means that, on average, the factor conditions in South Africa generally have a constraining effect on the competitiveness of the apple industry.

5.6.2   Demand factors

Using the ratings from the AES, factors impacting on the demand conditions as a determinant of the competitiveness of the South African apple industry were identified. According to this, the local market size (and local market growth) was rated as a demand condition with a neutral effect. The growth of the local market thus could be neglected in future strategies, because the

SA apple industry is mostly export driven. However, it remains an important market because around 22% of the crop is sold in local market every year (Hortgro, 2012).

However, the growth in the international market is what drives the SA apple industry, as more than 50% of the total production of apples are exported (Hortgro, 2012). The industry sees this market as highly enhancing (5/5), with particular challenges to remain, inter alia finding and developing new markets to counter declining demand in traditional markets such as Europe.

As shown in Table 5.6 above, the average score for the demand conditions determinant is 4.01 out of 5, which means that, on average, the demand conditions in South Africa generally have a enhancing effect on the competitiveness of the apple industry. Figure 5.7 below illustrates the ratings of all the demand conditions identified by the AES as determining the competitiveness of the South African apple industry.

Figure 5.7 Demand conditions determining the competitiveness of the South African apple industry
Source: Apple Executive Survey (2012)
Ratings: 1 = highly constraining; 3 = neutral; 5 = highly enhancing

5.6.3 Related and supporting industries

Most of the supporting industries are rated as enhancing – having contributed positively to the competitiveness of the industry – and contributed 4.15/5. These include financial and agricultural suppliers, support industries, such as transport collaboration with research institutions, and the quality and sustainability of local input supplies – all enhancing the competitiveness of the

industry. This is in contrast with electricity supplies, as the average rate (2/5) indicates a constraining impact. An increase in electricity would result in an increased cost of production and therefore it increases the cost of doing business, which would hinder the competitiveness of the industry. Since 2008, electricity costs have escalated as the national power grid (power stations) in South Africa has aged (Ndou, 2012). Eskom, South Africa's public electricity utility, increased the taxation on electricity by 27% in 2008, from 8% the previous year; then 30% in 2009. However, as of 9 March 2012, the National Energy Regulator of South Africa (NERSA) revised the power tariff downward to 16% (Ndou, 2012).

Another important underperforming industry is telecommunication (2.4/5), where Telkom is the dominant fixed-line service provider, controlling more than 90% of the fixed line market (Ndou, 2012). Apples are highly perishable products and therefore they require cold storage. The respondents indicated that storage facilities were available, but were viewed by the industry as constraining competitiveness (2.3/5), as they are costly to use – storage facilities are rated as the second most constraining factor supporting service in the apple industry. Figure 5.8 below illustrates the ratings of all the related and supporting industries identified by the AES as determining the competitiveness of the South African apple industry.

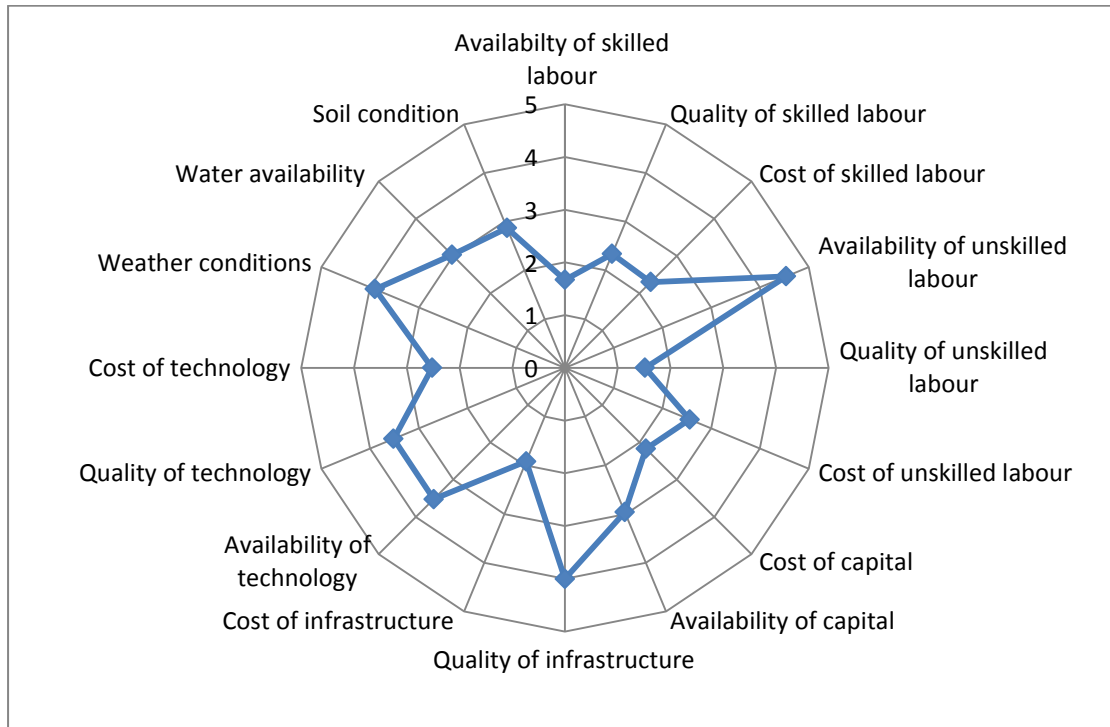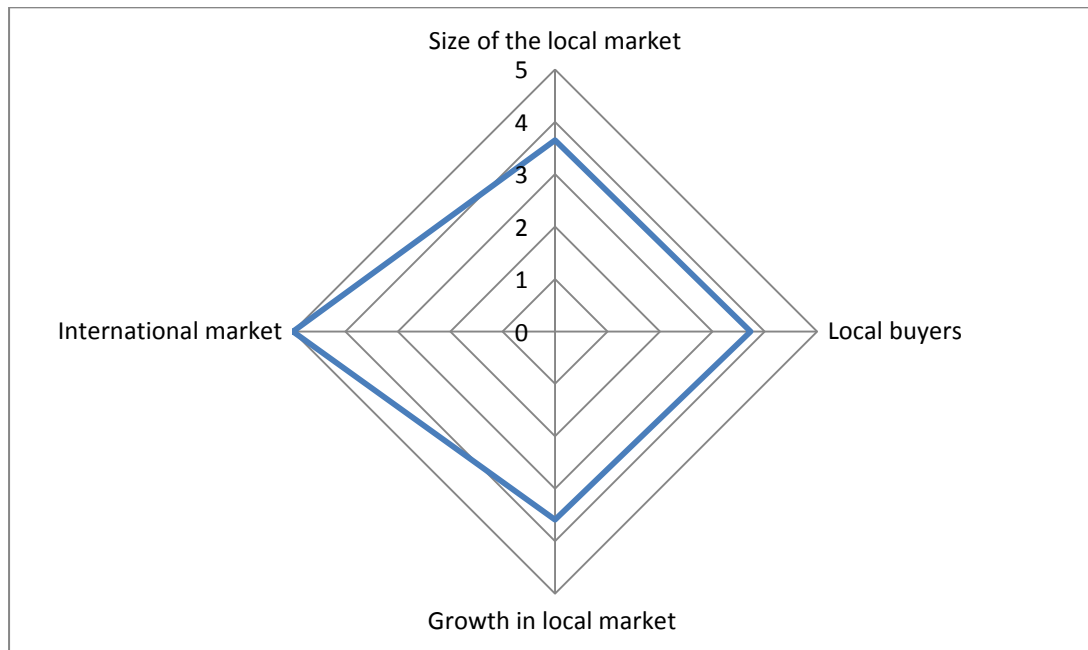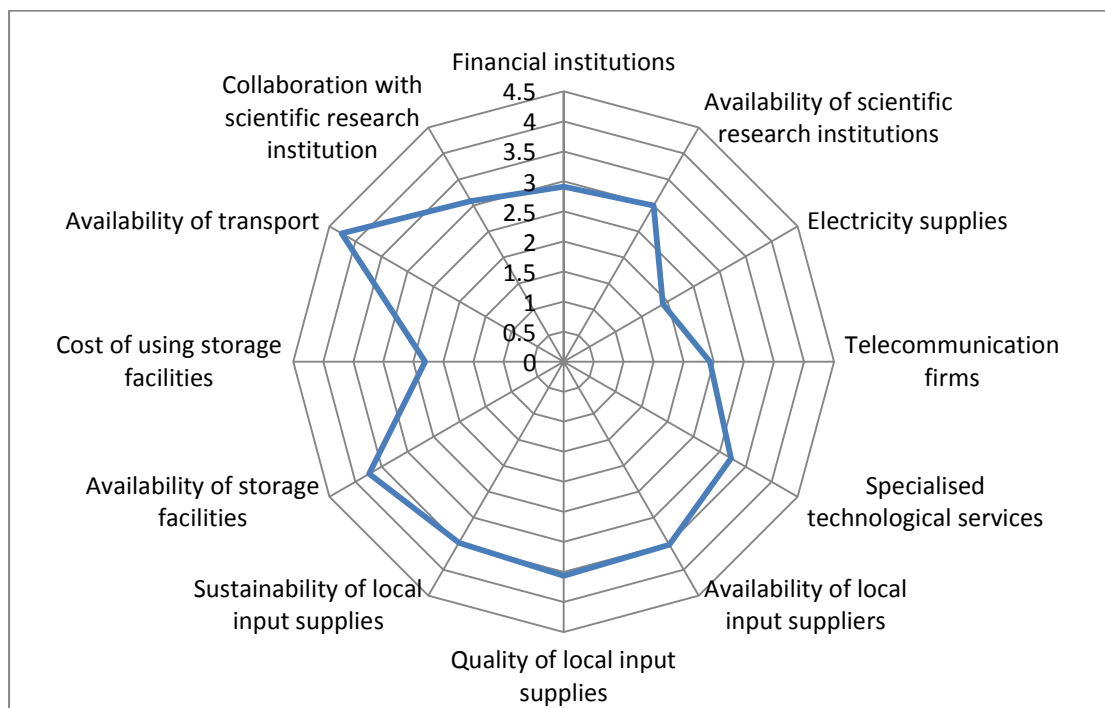**Figure 5.8 The Related and supporting industries determining the competitiveness of the South African apple industry**
Source: Apple Executive Survey (2012)
Ratings: 1 = highly constraining; 3 = neutral; 5 = highly enhancing

The overall mean for Related and Supporting industries was 4.15, which means that these factors generally have an enhancing impact on the competitiveness of the South African apple industry, except for electricity, the high the costs of storage and telecommunications.

5.6.4   Firm strategy, structure and rivalry

The respondents indicated that domestic competition, rated (4.1/5), created pressure on them to improve and innovate; this enhanced their ability to compete in the international market. These aspects were debated during the focus group discussions and it was established that, in the apple industry, competition goes beyond apples. Other fruit types can be substitutes for apple; fruit juices can also be substitutes and compete with fresh fruits, especially with the rapidly growing need for convenience in the global consumer markets, especially those in the developed countries.

In addition, there also is competition with other products other than fruits; apples are classified as a snack product as they are a ready-to-eat snack and compete, inter alia, with products such as sweets, chocolates, chips, wheat snacks, cold drinks, milk products like yoghurt, and vegetable snacks for the consumer's attention. The recent development of a large number of ready-to-eat products in particular has increased competition for retail shelf space, and the prices of these substitute products definitely have an effect on the demand for apples (Hughes, 2004). This trend holds a real threat and opportunity to apple suppliers, as it could mean a decrease or increase in the existing retail market for apples. This point is further highlighted in Step 5 in Chapter 6.

Spending on R&D (4.40/5) is indicated as one of the most enhancing factors, with a higher mean value than any other determining factor of competitiveness under firm strategy, structure and rivalry components.

Market information also plays a vital role in enhancing the competitiveness of the industry, including information flow from both customers (4.0/5) and primary suppliers (4.01/5) to the industry, as indicated in Figure 5.9 below. This indicates a responsive marketing system with good flows of intelligence.

Figure 5.9 below shows the ratings of these factors summing up to an average score of 4.5/5. Firm Strategy and Rivalry thus generally have a stronger enhancing impact on the

competitiveness of the apple industry in South Africa than all the other determinants of the Porter Model. This indicates an industry that has succeeded in positioning at the firm level to operate competitively in local and global markets. Scope for improvement is still significant, however, but improvements in the other determinants are of equal, and sometimes higher, importance. This point will be attended to in Step 5 in the next chapter.
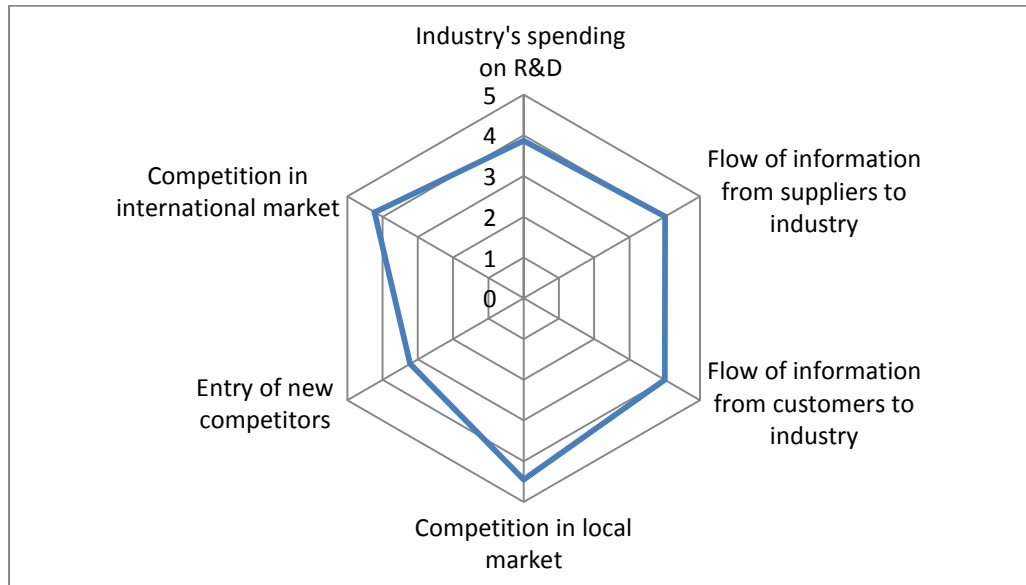
Figure 5.9 Firm strategy, structure and rivalry determining the competitiveness of the South African apple industry
Source: Apple Executive Survey (2012)
Ratings: 1 = highly constraining; 3 = neutral; 5 = highly enhancing

5.6.5 Government support and policy

In Figure 5.10 below, the impact of government support and policies as a determinant of the competitiveness of the South African apple industry is illustrated as being constraining, neutral or enhancing according to mean values from the AES. Administrative regulations (1.8/5), trust in the political system (1.8/5), land reform (2.1/5), the tax system (2.4/5) and the BEE policy (2.4/5) have constraining impacts on the competitiveness of the industry.

Land reform in South Africa has been a topical issue for over twenty years, and government has been heavily criticised for not meeting its set targets and making very little progress moving towards these set targets. This also creates uncertainty and reduces the attraction for investment in the industry, with negative impacts on the competitiveness of the industry because producers are reluctant to re-invest or expand investment in apple production (Dall, 2013).

A number of the labour laws that were introduced in the 1990s are viewed in the AES as constraining the competitiveness of the industry. The main laws referred to are labour laws: the Basic Conditions of Employment Act of 1997, and the Employment Equity Act of 1998. Although these laws benefit employees, they also often result in higher transaction and wage costs for employers, especially the low-skilled worker group. These trends were also noted by the apple industry as being constraining (1.6/5). Methods to increase labour productivity and to capture the benefits of high labour standards in selected global markets were thus highly promoted in focus discussions to counter such constraining impacts (refer to Step 5, Chapter 6).

On the other hand, trade regulatory standards and competition law were rated as having an enhancing impact on the competitiveness of the apple industry, with values of 4/5 and 4.1/5 respectively. It is also interesting to note that compliance with current environment standards is considered to enhance competitiveness (4/5). This is in line with efforts to access and maintain/grow high value and affluent global markets, where such standards are required.

Figure 5.10 Government support and policies determining the competitiveness of the South African apple industry
Source: Apple Executive Survey (2012)
Ratings: 1 = highly constraining; 3 = neutral; 5 = highly enhancing

The average score of government support and policies as a determinant of competitiveness is 2.39, implying that the industry judges this group of factors as being marginally constraining to the competitive performance of the apple industry in South Africa.

5.6.6 Chance factors

The responses in the AES to the chance factors determinant of competitiveness considered these as being the most constraining. This indicates a general view that certain factors are not within the control of the industry or of firm-level strategies, and these are strongly constraining competitiveness performance.

The costs associated with crime are rated to be the most constraining factor amongst the chance factors (1.6/5). The health factor, emphasised by HIV/Aids and other serious diseases, was rated as the second most constraining chance factor (2/5). Both of these have impacts on a stable work force and investment expectations. Strategies to improve the health status of workers in the industry, together with investment in recruiting and training workers, thus are important (refer to Step 5, Chapter 6).

Exchange rate movements were indicated as being a constraint to the competitiveness of the South African apple industry. The South African apple industry is export orientated and therefore the fluctuations in the exchange rate of the Rand against the major currencies of the world play a vital role in final grower returns. Figure 5.11 shows all the chance factors listed in the AES that influence the competitiveness of the South African apple industry. The overall mean for the chance factors determinant was 2.24

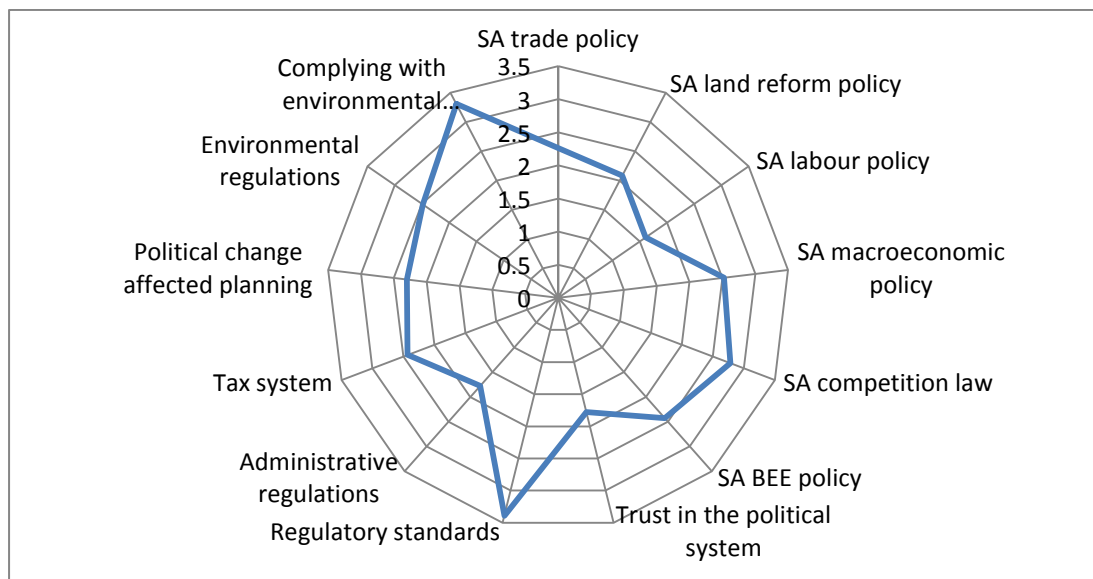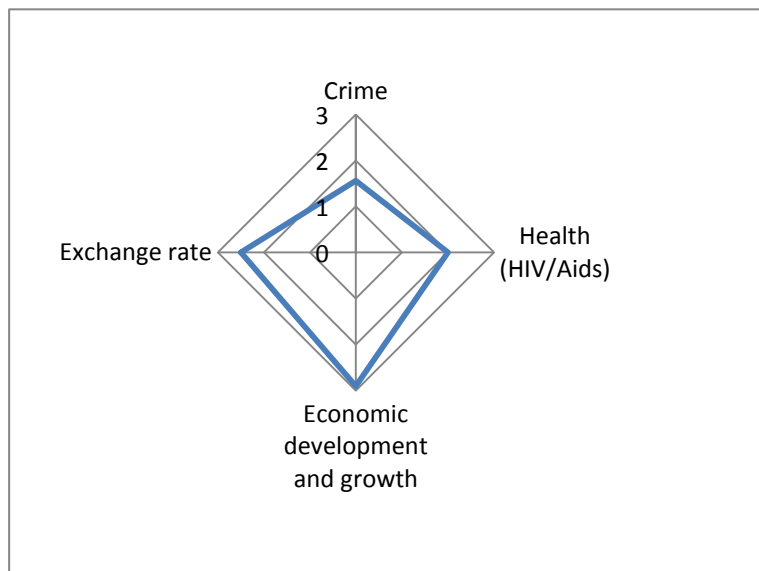**Figure 5.11 Chance factors determining the competitiveness of the South African apple industry**
Source: Apple Executive Survey (2012)
Ratings: 1 = highly constraining; 3 = neutral; 5 = highly enhancing

5.6.7 Conclusions on Step 4

Table 5.8 and Figure 5.12 illustrate the Porter analysis of the determinants of competitiveness for the South African apple industry in terms of the overall mean for each determinant as rated by the AES respondents.

Table 5.8 Rating the determinants of the competitiveness of the South African apple industry

Factors	Rating
Factor conditions	2.07
Demand conditions	4.01
Related and supporting industries	4.15
Firm strategy, structure and rivalry	4.5
Government support and policies	2.39
Chance factors	2.24

Source: Apple Executive Survey (2012)
Ratings: 1 = highly constraining; 3 = neutral; 5 = highly enhancing
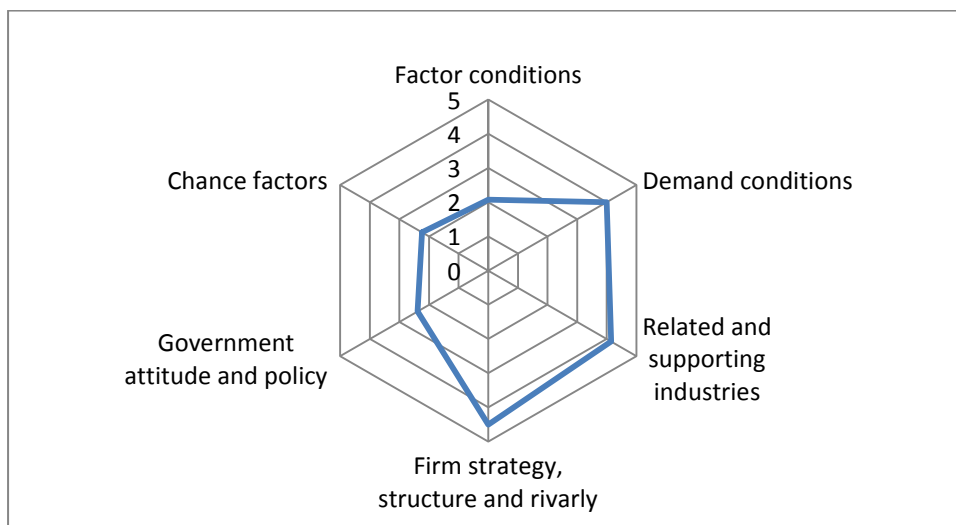
Figure 5.12 The Porter Diamond model
Source: Apple Executive Survey (2012)
Ratings: 1 = highly constraining; 3 = neutral; 5 = highly enhancing

As can be seen in Figure 5.12 above, factors related to firm strategies, related and supporting industries and demand conditions are considered as the key enhancing determinants that provide the apple industry in South Africa with a relatively high standing in the global competitive environment. Factor conditions, chance factors and government support and policy affect the competitiveness of the South African apple industry in a constraining manner.

The Porter Model provides a systematic strategic framework to improve the competitiveness of the South African apple industry:

- future strategies to improve industry competitiveness should strengthen the enhancing determinants; and

- the performance of the various factors within those determinants currently constraining competitiveness should be improved.

Some pointers towards such a comprehensive strategy are provided in Step 5 of the analysis in the next chapter.

5.7 Conclusion

In analysing the Porter Model, the most important factors that were found to have a negative impact on the competitiveness of the South African apple industry were quality of low-skilled labour, cost of crime, availability of skilled labour, SA labour policy, cost of infrastructure, trust in the political system, administrative regulations, health-related issues (HIV/Aids), cost of capital and land reform policy. The findings indicate that much needs to be done in these focused areas to boost the competitiveness of the industry in the international market.

Factors that enhance the competitiveness of the industry were growth in the international market, availability of unskilled labour, availability of transport, competition in the domestic market, industry expenditure on R&D, quality of infrastructure, availability of storage facilities and SA competition policy. The industry needs to capitalise on these factors in order to improve its competitiveness.

CHAPTER 6: SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

6.1 Introduction

The study had a central purpose of analysing and measuring the relative competitiveness of the South African apple industry. The SA apple industry must compete against other apple industries and also against all other industries for access to increasingly scarce natural resources, for inputs of every kind, from financial and chemical to managerial, and for a share of the consumer`s stomach. The range of products against which apple products must compete becomes ever larger, more sophisticated and more cleverly targeted to appeal to consumers' intrinsic and extrinsic needs. Today's consumer-driven market poses challenges that affect the trade of fruits, including the traditional exporters of such (Ndou, 2012). It is crucial to evaluate the competitiveness status of important industries in order to suggest strategies to overcome the business environment challenges facing the industry.

To increase competitiveness, participants firstly need to identify the major priorities that require renewal or change. They then need comprehensive strategies for tackling problems/challenges, whether they lie within the production realm, elsewhere in the value chain or are the results of misguided policies.

The main aim of this chapter firstly is to summarise the argumentation and processes followed and the findings of the study; secondly, to recommend some strategic actions and pointers gained from these findings to improve the competitive performance of the South African apple industry (Step 5 of the stepwise framework), and finally to draw conclusions on the objectives of the study and the validity of the stated hypotheses, and to recommend further research to be undertaken on this topic.

6.2 Summary

Chapter 1 served as an introduction to the study and provided the background to the research problem, the objectives, the research design, and the research methodology and data used during the research process. Chapter 2 reviewed the relevant literature on the analysis of competitiveness, and applications in the agricultural sector. Various definitions of competitiveness and previous studies conducted in the area of competitiveness were reviewed,

and the different measures of competitiveness were evaluated. Chapter 3 presented the "five-step" analytical framework, which outlines the methodology used in this study, and the data that was used.

Chapter 4 contained an overview of major aspects of the South African apple industry, inter alia its institutional structure, production areas and volumes and major markets, establishing the importance of trade in the international market for fresh apples. In Chapter 5, the five-step methodology proposed in Chapter 3 was applied to analyse the data and interpret views obtained from the industry.

The first step of the methodology was to define competitiveness as it applies in the apple industry. Various views were considered on how competitiveness is defined; this study was largely based on how Freebairn (1986) and Esterhuizen (2006) define competitiveness. In their view, industries and firms are

> competitive when they are able to continue to grow their trade in today's global environment, through product offers, which are qualities, prices and services that are as good as, or better than their competitors. This will enable the most competitive players to attract sufficient scarce production factors –such as capital, land, labour, technology and management- from competing economic activities to sustain and expand their performance

In simple terms, "to be competitive in today's world is to be in a position to continue to trade successfully relative to the competition i.e. to consistently outperform the competition". This definition was selected because it allows competitiveness to be measured in trade terms and this satisfied the objective of this study which was to measure competitiveness comprehensively.

The second step of the methodology was to measure empirically the competitiveness of the apple industry, using selected competitiveness measures, namely RCA, NXi and RTA, which are appropriate to measure competitiveness in a trade-orientated industry. Trends in competitiveness from 1961 to 2012 were established, based on FAOSTAT and Trade Map data, and all these measures showed that fresh apples are competitive in the international market. The competitiveness of the apple juice industry was also measured, and this showed a decrease in competitiveness over time.

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Competitiveness was also measured for selected international apple-producing competitors of the South African apple industry, using RTA methodology. Chile was identified to be the most competitive in the global apple industry. New Zealand also rated better than South Africa, but SA was rated better than most other countries, such as Argentina, the Netherlands, Italy, Brazil, France, China, the United States and Poland.

The third step was to gather information from industry experts and knowledgeable stakeholders on factors have an impact on the competitive performance through the Apple Executive Survey (AES), an individual survey with focus group discussions and personal interviews.

In Step 4, the Porter Model was used to categorise the mentioned factors and to select the main determinants of competitiveness in the SA apple industry; factor conditions, demand conditions, related and supporting industries, firm strategy, structure and rivalry, government support and policy, and lastly, the chance factors. These factors and determinants were than rated as either enhancing, neutral or constraining the industry's competitiveness.

The fifth step in the analysis was to recommend pointers, actions and strategies for enhancing the long-term competitiveness of the industry based on the findings and discussions with the industry. This step is attended to in the next section. This, however, cannot be viewed as a fully-fledged strategic planning exercise; rather, it provides intelligence to support such strategic planning activities.

6.3 Strategic recommendations, actions and strategies to enhance the competitiveness of the South African apple industry (Step 5 of the analysis)

Porter (1990) argues that a country or an industry can make itself more efficient through the strategic management of its determining factors (determinants). In this view, there are six determinants (sets of factors) that direct the competitive advantage of an industry. Each of these factors can be influenced by the industry itself, by government, and by other industries and nations. Porter also emphasises that although certain nations have gained a competitive advantage over others in certain sectors, it is individual firms that compete, not nations. Therefore, industries can and should do something about their competitiveness.

The industry and the South African government thus need to work together in partnerships to try to direct those factors in which they have relative control to ensure the future sustainability of the apple industry. The discussion of the measurements and determinants of the competitiveness of the SA apple industry described in Chapter 5, obtained from industry participants in a number of focus group sessions and with individual leaders, enabled the formulation of a number of strategic directives to be considered by the industry. These recommendations, however, cannot be viewed as the outcome of a fully-fledged strategic planning process: rather, they serve as recommendations forthcoming from the "intelligence" produced by the study. Such recommendations for the industry will be presented in terms of the Porter Diamond Model.

6.3.1   Factor conditions

Production distribution and replacement

One production-related factor that leads to many related problems is the issue of orchard distribution, especially the age of the main varieties, particularly Golden Delicious and Granny Smith. Over 50% of South African apple trees are older than 15 years, with 33% being older than 25 years, while the replacement age of apple trees is around 20 years (Hortgro, 2012). Younger trees are more productive than older trees. The fact that such a large percentage of South African orchards are older than 25 years is a major reason for concern, because this can have an impact on the competitiveness of the industry, as older orchards are associated with lower production and lower quality fruit, leading to lower pack outs as well as economic inefficiencies in terms of tree planting distances and row widths. This indicates an expected deterioration in volume and quality in the next five to 10 years, as many of the old orchards will have to be grubbed.

The industry should plant new orchards of Granny Smith and Golden Delicious, although not at the same time, for example structured plantings at 3% each year for five years so that the orchards do not reach maturity at the same time to maintain a supply of these varieties to the international market.

The industry should, however, also take cognisance of market trends in specific cultivars (varieties) sold on the world market in order to keep track of market requirements to improve the product/cultivar mix to remain competitive in the world market. Pink Lady, Royal Gala and Granny Smith are highly preferred in lower-income categories and in many of our new African markets, therefore plantings of market-related varieties are encouraged.

Continuous technical innovation

Innovation includes improvements in technology, better ways of doing things and new ideas for approaching markets. Over the years the apple industry has introduced a wide array of new technologies at every level of the production system. The net effect has been to make the industry more productive and also more capital intensive. The new technologies have brought numerous benefits. Indeed, without them, the industry would find it difficult to compete in the international apple market.

Research needs to be done to develop better varieties and rootstocks in terms of productivity, drought resistance and disease resistance; the possible impact of climate change needs to be accommodated in such research, for example, planting varieties with lower chill requirements, because the predicted rise in temperature and the reduction in rainfall could result in adverse effects on the production and profitability of the industry (Dall, 2013; Hortgro, 2012). This can lead to substantial improvement in the competitiveness of the South African apple industry.

Cost of production

The apple respondents in this study indicated that the high cost of production in South Africa constrains the country's ability to compete successfully in the international market. Included in the cost of production is the cost of inputs. The real costs of the key inputs used have continued to increase, as agriculture is competing with other potential users of these key inputs. These include inputs such as capital, land, water, energy, chemicals, labour, technical experts and managerial talent. The industry needs to identify critical points in the supply chain where transaction costs can be reduced in order to improve its competitiveness. For example, lower transportation costs would make a difference and boost the competitiveness of the South African apple industry. These cost can be mitigated if the industry can consider coordinating its activities, such as when farmers transport their products to the market, instead of sending produce to the market on their own, therefore their competitiveness can be improved through cost sharing; they can buy inputs together, they can also negotiate for prices as a unified group, because coordination would increase their bargaining power.

Skills training

The availability of skilled labour is another issue of concern identified by the respondents in this study, who pointed out that the availability of skilled labour is limited and that this constrains the competitiveness of the industry because farm wage levels do not attract skilled or qualified people to undertake menial and hard work. However, there are some tasks that need to be performed by skilled people, such as pruning. Skilled labour is required in order to manage sustained productivity, therefore the training of labourers is needed in order for the required skills to be obtained in the apple industry. This should be a joint responsibility of the industry and the government. Another big concern that the respondents raised was the health of the workforce and the prevalence of HIV/Aids, tuberculosis and other illnesses. The workforce needs to be more educated about these illnesses, as the government has already invested in health, and it must continue to do so.

Potential of biotechnology

The recent battle about the use of GMOs in agriculture has mostly involved products like grains and cotton. However, the debate over the role of biotechnology is about to move to the forefront in the apple industry after a small Canadian firm, Okanagan Specialty Fruits, sought approval in the United States for its Arctic apples, which have been genetically engineered to include an anti-browning gene. Genetic engineering is defined as the transfer of a gene from one species to another; this has been widely practised in agriculture and medicine for many years, with spectacular benefits for agricultural productivity and human health (O'Rourke, 2011). Genetic engineering is safer, more efficient and more economical by permitting the targeted transfer of only the desired trait (Ndou, 2012).

The South African apple industry could possibly use genetic engineering to improve its productivity and the quality of its rootstocks, trees and fruit, reduce the impact of insects, viruses and diseases, and meet the competition of other apple producers overseas. Research needs to be done on the goals, methods, results and implications of genetic engineering. Only if the process is fully transparent will it win the trust of the general public and obtain financial support from the government.

6.3.2   Demand conditions and factors

Development of alternative markets

Although the apple industry has a diversified export market, a continued search for potential markets is encouraged. Serving entirely new markets and market segments, coupled with innovation and improvements in fruit quality, can create a competitive advantage. South Africa's traditional market (Europe), a market that is characterised by a wide range of trade barriers, has been declining over the past six years, as discussed in Chapter 4 of this study. It is uncertain what is going to happen in the future, hence alternative markets should be identified and developed. It is noted that South Africa is also exporting its apples to Asian and African markets, and the two continents present enormous opportunities for South African apple exports, given their ever-increasing populations and per capita incomes (O'Rourke, 2011).

For the South African apple industry to sustain and increase its competitiveness for decades to come, it is very important to put in place initiatives that would lessen the industry's dependence on the EU market. There is great potential in non-apple-producing countries for apple consumption, as it is projected to increase in the future. O'Rourke (2011) identify six regions that have little or no domestic production of apples, but with an increasing demand potential – the three tropical regions of Africa, Central America and the Caribbean in the Americas, and South-eastern Asia. These, and particular the African regions in general, are "small fruit preference" markets that pose the ideal opportunity for South Africa to export small fruit (Dall, 2013; O'Rourke, 2011). Due to many factors, South Africa in general is not a region for producing large fruit, of which the location and climatic conditions (not enough cold units) are probably the two factors with the greatest influence on fruit size.

Promotion

Strategies are needed to convince and influence the behaviour of consumers to buy SA apples. Promotion mentioning the health benefits associated with the consumption of apples, i.e. the concept of "an apple a day keeps the doctor away" or "one apple a day, one wise idea", could have positive effects on the profitability of the industry. However, it remains important that such claims are scientifically substantiated (O'Rourke, 2009).

Consumer orientation

Only consumer-orientated businesses succeed in today's global competitive environment, and for this reason it is recommended that the industry now drastically needs to change its focus from being production orientated to being consumer orientated (O'Rourke, 2011). This means that the industry needs to shift from producing what they can produce to producing what consumers want. The "rules of the game" have changed to such an extent that consumer preferences now rule and dictate terms, not the other way round, and therefore it is not wise to increase agricultural production without due consideration of what the market demands (consumer demands). Consumers are now much more concerned about food quality and safety, the environment and animal welfare, and supply chains likely to play important roles in shaping the future of agricultural trade. These developments require a change from a producer focus to a consumer focus. The following could be considered to position the industry in a more consumer-orientated manner:

- Firstly, in today's market, quality is one of the factors that determine whether a consumer buys the product or not. The industry should focus on improving the quality of its produce to satisfy the consumers.

- Secondly, the industry should consider planting new varieties of apples, depending on what consumers demand the most, which now is Golden Delicious, Granny Smith, Pink Lady, Fuji and Royal Gala (Dall, 2013).

6.3.3   Firm structure, strategy and rivalry

Working relationships between the role players

The competitive advantage of a firm or an industry is developed through the way in which the firm or industry organises and performs discrete activities in the value chain (Porter, 1990). The South African apple industry needs to ensure that it consists of a value chain that provides for a faster, more coordinated system of product movement, processing and delivery, which will continue to lower costs while maintaining product quality, freshness and safety. Value chain management therefore is one of the most important ways of improving the competitive advantage of the industry. Competitiveness decreases if the supply chain is not functioning in an effective and efficient manner.

The apple industry must improve the working relationships in its value chain, and communication must be good between the role players, this will avoid the delay in the delivery of the product

between the role players, therefore the industry can increase its production and make the product available to consumers at the time and place and in the form that the consumer wants. Dall (2013) contents that, in the future, supply chains will compete among themselves and, if only certain elements in the supply chain perform efficiently, then the full potential for value adding will not be realised. Therefore it is no longer good enough for farmers to compete at the farm-gate level, while value-adding activities (processes) are not globally competitive. Value adding should become a focal area for investment, and research and technology development therefore will have to focus on downstream consumer requirements, both locally and internationally.

6.3.4   Related and supporting industries

Most of the supporting industries were rated by the respondents as having contributed positively to the competitiveness of the industry, especially the financial and agricultural suppliers (which are competitive and sustainable). However, electricity suppliers and telecommunications constrain the competitiveness of the industry. The South African government should try to fight the monopolistic power that some industries and firms exercise because they constrain the competitiveness of industries that require inputs from these monopolistic companies, for example Eskom and Telkom. This gives strong bargaining power to the suppliers and badly affects the producers.

6.3.5   Government support and policy

Focus on education and knowledge development

Apart from the government's role to promote general public goods, such as basic national infrastructure, and research of broad national concern, such as on health care, the government has a critical responsibility in promoting primary and secondary education and skills development systems. The quality of low-skilled labour and the availability of skilled labour are constraining the competitiveness performance of the South African apple industry. Capacity is needed for sustainable productivity; therefore government and the industry should focus on improving labour relations and training in South Africa. This can be done through internship programmes, in which students who studied agriculture can serve one year internships in the field of agriculture, and technical training skills can also be offered by the agricultural colleges so as to improve the skills level of the agricultural labour force.

Create a friendly business environment

The government's role in enhancing the competitiveness of the industry is also to ensure the proper working of the market as a result of its policies. Its role should be to create a friendly environment in which the industry can prosper. Some government policies need to be revised, such as the land reform policy. The respondents indicated the reluctance to invest in farming (much criticism and frustration was expressed about the lengthy land reform process). Government is responsible for creating the right environment in which businesses can operate effectively. Government therefore can enhance the competitiveness of the industry by ensuring the proper working of the market.

Promote investment

Government plays an important role in shaping the environment, which directly influences the goals of investors, managers and employees through its policies in various areas. Government should aim to encourage investment in human skills, innovation and the physical assets needed by the apple industry. There should be trade promotion, especially in the new markets, and government liaison on matters such as BEE, land reform, transformation, research and development should be improved.

6.3.6 Chance factors

Fight crime

The respondents indicated that the current high level of crime in South Africa imposes costs on the industry as a whole and this constrains the industry's competitive performance. A lot needs to be done in this regard to fight crime, because crime does not end with farmers being robbed of their produce, but it has some implications that come back to adversely influence the competitiveness of the industry, one being that it influences the level of investment in South Africa. People from abroad will not invest in or do business with South Africa and this decreases competitiveness, as was explained in Chapter 3 of this study that there is a strong, positive relationship between foreign investment and the competitiveness of an industry or a country.

The high incidence of HIV/Aids has been identified as constraining the industry's competitiveness. Crime and Aids are externally manipulated factors over which the industry has relatively little control, therefore the government has to play an important role in making sure

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that it manages these issues. Government efforts to manage the HIV/Aids pandemic, to combat crime, and to ensure macroeconomic stability will reduce the costs associated with chance factors, and this will enhance the competitiveness of the South African apple industry.

6.4 Recommendations for further research

From the preceding analysis, a number of topics/fields for further study can be identified:

- Full value chain analysis – this study focused on the competitiveness of the industry, in particular on the performance of fresh apples and with references to apple juice. The study cannot, however, conclude on the performance of all role players in the value chain individually. The methodology could be extended to do such and a more detailed analysis of the South African apple fruit industry value chain needs to be undertaken, from the farmer to the consumer, and with reference to the various determinants of the Porter Model at each of the links in the chain. This will help provide a stronger indication of where the weak/strong links in the value chain lie that affect the overall competitiveness of fresh apples and apple juice.

- Export performance – the performance of an industry in the export market requires continuous assessment. Business environmental forces change rapidly over time – climate change, exchange rates, demand conditions and evolving consumer tastes, safety and health standards, etc. all have an impact on performance. Such studies are important, and information gathering and evaluation should be done in accordance with how they affect and shape the industry's strategies in international competitiveness. Where the industry as a unit undertakes such studies with the support of government, the outcomes should be made available to all key players in the value chain and to policy makers to assist with the formulation of strategies and policies that will promote an effective and internationally competitive industry.

- New market development – in this study it also was proposed that the apple industry should find alternative markets for its products, for example because the European market is decreasing apple imports from South Africa. The markets in Africa, Oceania and America were suggested; comprehensive studies need be conducted in this regard. Any improvement in the international competitiveness of the industry will play an important role in enhancing economic growth, and the framework used in this study can be used in a research study to analyse the competitiveness of any industry, not just the apple industry,

so as to recommend strategies to increase the competitiveness of those industries or sectors for the benefit of the country.

- Consumer tastes and preferences change over time. The demand conditions of the apple industry need to be analysed. According to Porter (1990), demand conditions are an important factor to help produce competitiveness. Therefore, this kind of study is imperative because demand conditions are an important determining factor of relative competitive advantage. The study should look at what consumers want from the apple industry, and the role players should strive to fulfil the consumers' needs.

6.5 Conclusions

The two hypotheses of this study were as follows:

Competitiveness in the SA apple industry is determined by a range of factors, which include productivity, market strategy, increased exports and local sales, the strength of the institutional support system, including policy and the value of the Rand; and

There has been a marked improvement in the competitiveness of South African apple industry since the deregulation of the agricultural sector in 1997

The two hypotheses that were formulated for this study have been proven to be true, which means they are accepted on the basis of the analysis in the study.

Firstly, it was shown, through the application of the RTA and other measures, that there was a sustained increase in the competitiveness of the industry after the deregulation phase in 1997. Secondly, it was found in Chapter 5 of this study, through the application of the Porter Model and the Apple Executive Survey, that a range of factors determine the competitiveness of this industry, and not a single factor in particular.

One of the questions that were raised in Chapter 1 was how competitive the South African apple industry is. From Chapter 5 it is evident that the South African apple industry is generally competitive in the global market. The results of the RCA# index analysis of the South African apple industry show that the industry has a comparative advantage in the production of apples. The Relative Revealed Comparative Trade Advantage (RTA) index analysis show that the industry is competitive internationally, although not at the high levels of Chile and New Zealand.

South Africa, however, consistently outperforms Italy, Argentina, France, Poland, China and the United States of America.

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ANNEXURE A : QUESTIONNAIRE

Sir/Madam

I am Asanda Jafta, currently enrolled for Masters of Science in Agricultural Economics at the Stellenbosch University and I am in the process of compiling my master's thesis research. The title of the study is to analyse "The competitiveness of South African apple industry" under the supervision of Professor C.J. Van Rooyen. The study is also conducted in collaboration with HORTGRO.

We value your contribution and understanding of the operational matters affection competitiveness in the industry. We will highly appreciate your participation in this study by spending around 15 -20 minutes of your valuable time to complete the questionnaire. Your expert opinion is essential in bringing light to competitiveness issues that are important for the country and the apple industry.

The questionnaire is designed scientifically according to Michael Porter's method (Competitive Advantage of Nations, 1990, 1998) and will ensure that an accurate picture of the current state of affairs is reflected in terms of factors influencing the competitiveness of the industry. The questionnaire will not take long to complete. Most of the questions in this questionnaire ask you to check a box (using an X) according to your opinion.

We would sincerely appreciate it if you can e-mail it back to us. Please note that the information will be confidentially, the responses from all participants will be summarized. If there are any uncertainties please do not hesitate to contact Asanda Jafta at 0735511226

Thank you in advance for your participation. I look forward to getting feedback from you.

Sincerely

Asanda Jafta

25 Die Berke, Pappagai st. Stellenbosch

16861671@sun,ac,za

Dear respondent,

Your support to this study will be highly appreciated as it will ensure a good practical application of the theory of competitiveness analysis.

Groete

Johan van Rooyen

cjvr@sun.ac.za

0218084757

SOUTH AFRICAN APPLE SURVEY 2012

Production Factor conditions

1) **The general infrastructure used by your company is:**

   Poorly developed
   and inefficient.

1	2	3	4	5

   as good as it can be

2) **The cost of infrastructure is:**

   Extremely high.

1	2	3	4	5

   very affordable.

3) **The cost of doing business is:**

   Extremely high.

1	2	3	4	5

   very affordable.

4) **The quality of technology for your industry:**

   Generally lags

   behind most other

1	2	3	4	5

   Is among the world
   leaders.

5) **Quality technology for you industry is:**

   Difficult to obtain.

1	2	3	4	5

   Easy to obtain.

6) **The cost of quality technology is:**

   Extremely high.

1	2	3	4	5

   very affordable.

7) **Obtaining credit for your company is:**

   Extremely difficult.

1	2	3	4	5

   Easy.

8) **Skilled labour is:**

   Difficult to obtain
   by you company.

1	2	3	4	5

   Easy to obtain by your

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9)   Skilled labour is:

Not of a very high
quality.

1	2	3	4	5

Amongst the best in
the world.

10)   Skilled labour is:

Too costly.

1	2	3	4	5

very affordable

11)   Unskilled labour is:

Difficult to obtain

1	2	3	4	5

Easy to obtain

12)   Unskilled labour is:

Not of a very high
quality.

1	2	3	4	5

Amongst
the best
in

13)   Unskilled labour is:

Too costly.

1	2	3	4	5

Affordable.

14) Climate,weather is:

adverse

1	2	3	4	5

favourable

15)
Soils   weak

1	2	3	4	5

favourable

16) Rainfall   weak

1	2	3	4	5

favourable

17) Water availability

weak

1	2	3	4	5

favourable

18) Other production factors that affects competitiveness

Demand/Market factors

19)   local market size is

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Too small? | 1 | 2 | 3 | 4 | 5 | large enough

20) Local buyers of apples are:

Slow to adopt new | 1 | 2 | 3 | 4 | 5 | Activiely seek out the latest

products,technologies   products, technologies and

and processes.   processes.

21) Is the growth in the local market...

Too
slow | 1 | 2 | 3 | 4 | 5 | Fast
enough

22) Other demand factors that affects competitiveness

Related and supporting industries

23) Financial services are generally

a constraint to your | 1 | 2 | 3 | 4 | 5 | an enhancement to your
company's
company's competi-   competitive
tive success.   success.

24) Scientific research institutions are:

None-existent. | 1 | 2 | 3 | 4 | 5 | The best in their fields.

25) Your company's collaboration with scientific research institutions in their R&D activity is:

Non-existent. | 1 | 2 | 3 | 4 | 5 | Intensive and ongoing.

26) Electricity suppliers are a:

constraints competitiveness | 1 | 2 | 3 | 4 | 5 | enhance the competitiveness

27) Telecommunication firms are a:

constraint of competitiveness | 1 | 2 | 3 | 4 | 5 | enhancement of competitiveness

28) Specialised technology services are:

	1	2	3	4	5	
Not available.						Availablle from world-class local institutions.

29) Availability of local suppliers of primary inputs

	1	2	3	4	5	
Largely non-existing.						Numerous and include the most important materials,components equipment and services.

30) The quality of local suppliers of your industry primary inputs is:

	1	2	3	4	5	
Inefficient and have little technological. capability.						Internationally competitive and assist in new product and proce- ss development.

31) The sustainability of local suppliers of your industry primary inputs:

	1	2	3	4	5	
Huge problem.						No problem at all.

32) Availability of storage facilities

	1	2	3	4	5	
Largely non-existing.						Numerous and include the most important materials,components equipment and services.

33) The cost of using storage facilities

	1	2	3	4	5	
Extremely high.						Affordable.

34) Availability of transport

	1	2	3	4	5	
not available						readily available

35)
Other

Firm strategy , structure and rivalry

36) Industry`s expenditure on R&D

	1	2	3	4	5	
massive						very low

37)   The information flow from primary suppliers to your company is:

	1	2	3	4	5	
Very						Very good.

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poor.

38) The flow of information from customers to your company is:

1	2	3	4	5

Very
poor.   Very good.

39) Competition in the local market is:

Very limited.

1	2	3	4	5

Very intense.

40) Entry of new competitors:

Almost never occurs
in the local market.

1	2	3	4	5

Is common in the local market.

41) Competition in international market is

Very limited.

1	2	3	4	5

Very intense.

42) Others , in opinion

Government support and policies

43) South Africa's trade policy is a:

Constraint to your

company's competitive
success.

1	2	3	4	5

Enhancement to your
company's
competitive
success.

44) South Africa's land reform policy is a:

Constraint to your

company's competitive
success.

1	2	3	4	5

Opportunity to increase your
company's competitive
success.

45) South Africa's labour policy is a:

Constraint to your
company's competitive

1	2	3	4	5

Enhancement to your
company's
competitive

					success.

success.

46)   South Africa's macro economic policy is a:

Constraint to your company's competitive success.	1	2	3	4	5	Enhancement to your company's competitive success.

47)   South Africa's competition law is a:

Constraint to your company's competitive success.	1	2	3	4	5	Enhancement to your company's competitive success.

48)   South Africa's BEE policy is a:

Constraint to your company's competitive success.	1	2	3	4	5	Opportunity to increase your company's competitive success.

49)   Your trust in the honesty of politicians is: political system

Very low.	1	2	3	4	5	Very high.

50)   Regulatory standards (e.g. Products standards, energy, safety, and environment) in your opinion are:

Lax or non-existent.	1	2	3	4	5	Among the world's most stringent.

51)   Administrative regulations are:

Burdensome.	1	2	3	4	5	Not burdernsome.

52)   The tax system:

Hinders business inve-
stment and risk-taking.

1	2	3	4	5

Promotes business investment
and risk-taking.

53) Have legal or political changes over the past five years undermine your company for planning?

Have severly undermi-
ned planning capacity.

1	2	3	4	5

Have had no effect.

54) Environmental regulations are:

Not enforced or enfor-
ced erratically.

1	2	3	4	5

Enforced consistently and
fairly.

55) Complying with environmental standards:

Hurts competitiveness.

1	2	3	4	5

Helps long term competitiveness
by promoting companies to
imp-
rove products and processes.

56) Other factors as experienced by your firm

Chance factors   (factors over which your firm has no control and are of an external nature to the
firm, industry and country)

57) Crime

Imposes significant
costs on your company

1	2	3	4	5

Does not impose significant
costs on your company.

58) Health -HIV/AIDS, TB, etc:

Imposes significant
costs on your company

1	2	3	4	5

Does not impose significant
costs on your company.

60) Economic development and growth in South Africa is a:

Constraint to your

company's competitive
success.

1	2	3	4	5

Opportunity to increase your
company's competitive
success.

61) Is the current exchange rate a:

	1	2	3	4	5	
Constraint to your						Enhancement to your company's competitive success.
company's competitive success. Why?						

GENERAL QUESTIONS - In your opinion:

1. What are the main factors that enhance the
competitive performance of your industry   of SA ?

2. What are the main factors that constrain the competitive perfomance of your industry?

3. Who are the most threatening competitors (both international and local)

4. Do you think the current strenght of the industry is
sufficient to cope with competition?   if not , what can be done?

5. How does the government influence the competitiveness of your industry?

THANK YOU SO MUCH FOR YOUR
TIME