Sources of Transaction costs in the South African Wine Supply Chain: Implications for enhancing chain competitiveness

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Problem Statement:

The South African wine industry produces a million tons of grapes annually and supports approximately 300 000 people. For the biggest part of the 20th century the industry was governed by a system of statutory control, being isolated from the international market by sanctions. As a result the main focus of the industry was on the domestic market and the value chain was structured to produce volume. In the 1990's, the removal of sanctions and statutory control, together with the global shift towards free international trade, created a new operational environment for the South African wine industry. New opportunities and threats emerged for the industry. The domestic wine market is stable but future growth of this industry will depend on exports. For this purpose the competitiveness of the supply must be enhanced.

Objectives:

In this paper the South African wine supply is characterised and analysed with the purpose of identifying possible transaction costs which induce inefficiencies and constrain the global competitiveness of the supply chain. Specific attention is paid to issues related to integrity in the chain. This analysis yield several factors (i.e. sources of transaction costs) around which competitiveness can be built.

Procedures:

This research draws from strategic planning (Vision 2020) that the wine industry had commissioned into their global competitiveness. This exercise involved all major stakeholders whose experiences and opinions were gathered through investigations and planning sessions held over the last two years.

The paper commences with a brief global perspective of the wine industry and specifically identifies the key drivers of global competitiveness in this sector. It goes on to compare 'new world' and 'old world' wine producing countries within which South Africa is then contexualised. Then follows a brief description of the South African wine industry in terms of history, economic contribution, the local market and a characterisation of the value chain. A transaction costs analysis follows.

Results:

The structure of the wine value chain was characterised into the following segments: (i) Soils and plant material; (ii) vineyard practices; (iii) cellar practice and wine making; (iv) packaging and distribution; and market development and marketing. These are supported by logistics; technology, labour and an institutional framework. The strengths, weaknesses and key success factors were identified for each stage in the supply chain. Each stage in the supply chain was subsequently subjected to a transaction cost analysis whereby the sources of transaction costs were identified within the realm of asset specificity, bounded rationality, opportunism, and information asymmetry. The most important sources of transactions costs are as follows: (i) the impact of viral infections, (ii) risks in terroir choice, (iii) moral hazards and free-rider problems in cooperative systems, (iv) research capacity limitations, (v) product image, (vi) inadequate information flows, (vii) inconsistent delivery times, (viii) intellectual property, (ix) human development, and (x) economic instability. Recommendations are formulated around each of these aspects.

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Summary

The South African wine industry produces on average about a million tonnes of grapes per annum and provides employment to approximately 300 000 people. For the largest part of the 20th Century the industry was subject to a system of statutory control and isolated from the international market due to political sanctions. The local market for wine has stabilised and the growth of the South African wine industry now depends on exports. Structured for the production of large volumes of wine, the South African wine industry also focused mainly on the local market. With the removal of statutory control and sanctions, combined with a global shift to free international trade during the 1990's, the value chain in the South African wine industry suddenly found itself in a new operational environment – an environment which exposed the industry to new opportunities and threats.

Ownership structures and property rights in the value chain of the South African wine industry is a result of the industry's institutional framework that developed over time. The current structure of the chain results in transaction costs in the various links in the chain.

The article commences with an overview of the development of the South African wine industry. This is followed by an examination of the composition of the South African wine industry and the structure of its value chain. Next, the opinions of shareholders in the South African wine industry obtained during the Vision 2020 study of the wine industry, are discussed along with the strengths and weaknesses of the industry. Transaction costs in the value chain of the South African wine industry are analysed and in conclusion, strategic options for making the value chain in the South African wine industry more market-oriented are identified.

1. Introduction

The wine industry is one of the oldest commercial activities in South Africa. The South African wine industry annually produces a million tonnes of grapes, making the country the sixth largest wine producer in the world. It provides employment to approximately 300 000 people, including agricultural entrepreneurs, farm workers and their dependants (SAWIS, 2000).

For the purposes of this study, the wine industry is defined as consisting of linked, interdependent primary and supporting socio-economic activities in South Africa that are based on the production, marketing and distribution of wine grapes. Primary activities include all activities involved in the production of wine. Supporting activities include logistics, technology, labour, and political and institutional frameworks that support the primary activities in the South African wine industry.

For the greater part of the 20th Century the South African wine industry was subject to a system of statutory control which provided clear guidelines for producers and other role-players in the industry. Although international isolation in the form of political sanctions was one of the factors that contributed to the development of the South African wine industry, it also caused a decline in its international market share.

Due to statutory control and sanctions, the South African wine industry's main concern focus became getting rid of surpluses, instead of developing market-oriented export strategies. For many years the market remained an abstract concept, far removed from the primary producer on the farm. As a result, the South African wine industry developed into an industry with an inward production-oriented focus.

2. The South African wine industry

2.1 History of the South African wine industry

The first wine was pressed by the first dutch settler Jan van Riebeeck on 2 February 1659. Van Riebeeck's joy is expressed in his famous words: "*Today, praise be to God, wine was pressed for the first time from Cape grapes and the fresh new wine was tasted from the vat*" (Opperman, 1968). This day is generally regarded as the birthday of the South African wine industry.

The first 250 years to the South African wine industry's history has two sides: a dark side, characterised by production-oriented slavery, poor working conditions, alcohol abuse, technological stagnation, poor quality and surpluses; and a brighter side of innovation, market-orientation, exceptional quality and shortages (Spies, 2000).

The birth of the Cape wine industry was accompanied by two basic weaknesses that persisted through the years. First, the government of the Dutch East India Company and its successors had no control over the establishment of vines. Wine production therefore increased in leaps and bounds. Secondly, the majority of the Cape wine industry was characerised by wine of poor quality. This was the result of careless viticultural and vinification methods, ignorance of the wine-making process and the fact that vintage wine could not be produced from poor clones of Semillon grapes (Van Zyl, 1993).

By the late 1850's, however, the industry was still exporting wine to the value of £120 000 per annum (90% of all exports used to be to Great Britain), despite constant complaints about the quality of the wine (Kassier, 1997).

However, in 1860 the enormous market for wine in Britain collapsed when a free trade agreement was concluded between Britain and France in that year. The immediate reduction in the import tariffs for French wine meant that Cape wines could no longer compete with French wines in the British market. Thus Cape wines could no longer capitalise on the

advantage they had enjoyed in Britain – an advantage not based on quality, but on preferential tariffs. In 1861 wine exports to Britain declined to a mere £8 000 per annum (Van Zyl, 1993).

During the 19th Century the South African wine industry suffered due to serious epidemics of powdery mildew and *Phylloxera vastatrix*. By 1918 political and market forces had further contributed to a serious over-production of wine, with the result that millions of litres of wine had to be dumped (Van Zyl, 1993). At a series of meetings in 1917, Charles W H Kohler, a leader in the wine industry, promoted a scheme among wine farmers. This led to the establishment of the Co-operative Viticultural Union of South Africa (later the Koöperatiewe Wijnbouwers Vereniging van Zuid-Afrika Beperkt, or KWV for short). By the end of 1917 approximately 90% of all wine producers had signed the KWV's constitution (Kassier, 1997). The aim of the scheme was to regulate the prices at which wine products were sold to the trade and in so doing, give producers greater bargaining power. Although the KWV brought production and price stability to the industry, it unfortunately did not foster a market-oriented attitude among producers.

With the removal of statutory control and the subsequent conversion of the KWV into a company, coupled with the global shift in the direction of free international trade in the 1990's, the operating environment of the South African wine industry, fundamental changes occurred in the industry in the scope of a few years.

South African wine exports suddenly rose sharply from 20 million litres in 1993 to 127,3 million litres in 1999 (SAWIS, 2000). The value chain in the South African wine industry, which was production-oriented and far removed from the market, was ill prepared for these changes. Suddenly a shortage of plant material and preferred cultivars was experienced, while cellars struggled to produce wines that met the demands of the market due to design flaws. The South African wine industry soon earned the reputation as a producer of wine of mediocre quality that could not guarantee on-time deliveries.

2.2 The South African wine industry's contribution to the economy

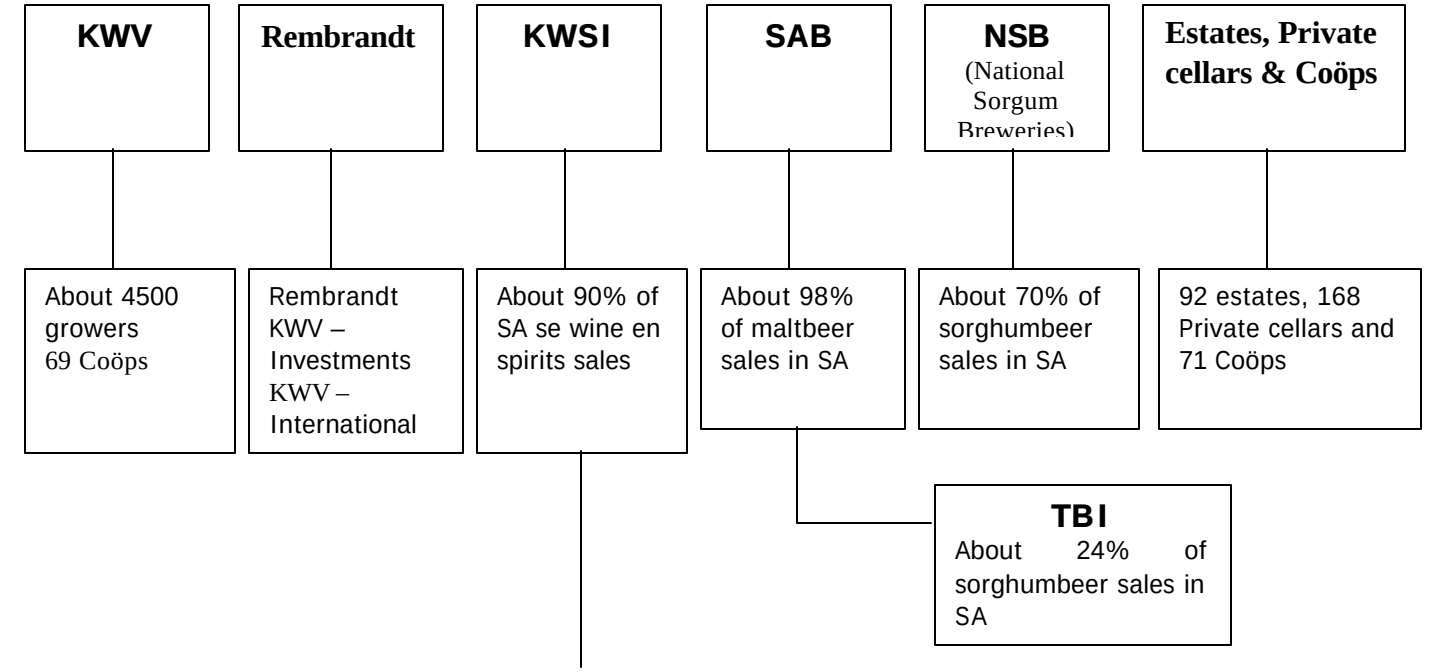
The total turnover of the South African wine industry in 1998 equalled R6 988 million. Exports comprised R792 million of this amount and imports R193 million. Tourism in the wine industry made an indirect contribution to the economy of R1 512 million. The South African wine industry's contribution to South Africa's Gross Domestic Product (GDP) amounted to R11 672 million. The original value of raw materials in the wine industry in terms of income generated (GDP) was R821 million, i.e. a factor of 14 (Du Plessis, 1999).

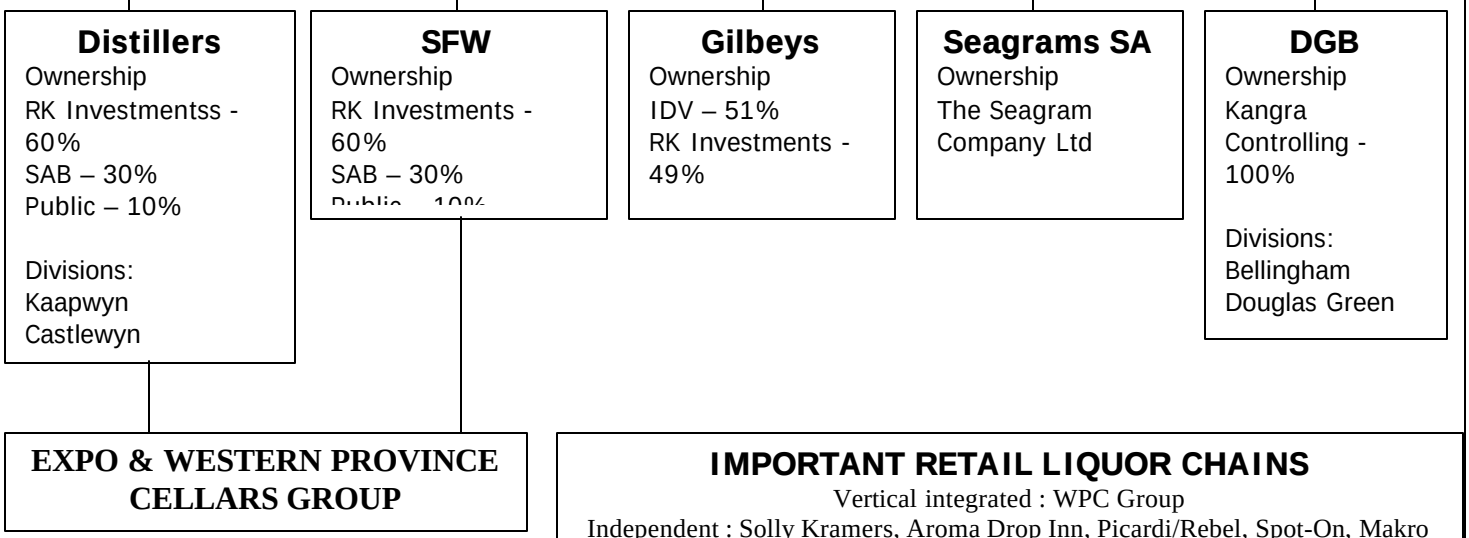
It is estimated that 62% of the wine industry's activities directly influence the economy of the Western Cape Province. Approximately R7 000 million of the GDP of R11 672 million will eventually remain in the Western Cape and benefit its inhabitants. The GDP:capital ratio corresponds to the ratio for the economy as a whole, namely 0,25. This means that for every R1 invested in the wine industry, an income of R0,25 (GDP) is generated every year. Calculations also show that 5,3 jobs are created for every R1 000 000 invested in the wine industry (Du Plessis, 1999).

2.3 Composition of the South African wine industry

2.3.1 Shareholding in the South African wine industry

The ownership structure by way of respective shareholding in the wine industry is depicted in the next diagram.





EXPO & WESTERN PROVINCE CELLARS GROUP

IMPORTANT RETAIL LIQUOR CHAINS

Vertical integrated : WPC Group

Independent : Solly Kramers, Aroma Drop Inn, Picardi/Rebel, Spot-On, Makro

• The Cape Wine & Spirits Institute (CWSI) is a trading company whose main members are the large wine and spirits wholesalers.

• KWV is an organisation that serves farmer interests and is run as a company,

• SAB en RK Investments (Rembrandt and KWV) are the most important shareholders in the SA liquor industry.

• Distillers en SFW are in the process of amalgamating.

2.3.2 Product mix

In the early 1960's the South African wine industry focused mainly on the development of the local market through the production of high volumes of basic white wine. The late 1960's and early 1970's were characterised by efforts to motivate grape producers to cultivate red grapes (Spies, 2000).

The price per tonne for red grape cultivars (for the production of low quantities) was however not profitable and instead many producers opted for high-yield cultivars like Chenin blanc and Colombard. New market conditions in the 1990's introduced sudden changes in focus and approach. However, a remarkable number of producers were unprepared for these changes (KWV Shareholders' Meeting, 1999). Table 1.1 illustrates that, compared to other new-world wine-producing countries, the South African wine industry lacked exposure to international market forces, with the result that a shortage of noble cultivars is being experienced.

Table 1.1: Surface (%) under vine for white, red and selected cultivars – 1998

	Percentage of total surface			
Cultivar	**Australia**	**Chili**	**USA**	**South Africa**
Chardonnay	14.9	8.8	21.8	5.7
Sauvignon blanc	1.9	9.0	2.9	4.9
Other whites	34.8	~	20.9	67.4
Total white cultivars	**51.6**	**~**	**45.6**	**78.0**
Cabernet Sauvignon	14.9	27.7	12.1	5.6
Merlot	3.9	11.1	9.7	2.6
Pinotage	~	~	~	4.7
Shiraz	18.2	~	~	2.0
Other reds	11.4	~	32.6	7.1
Total red cultivars	**48.4**	**~**	**54.4**	**22.0**
Total	**100.0**	**~**	**100.0**	**100.0**

Source: SAWIS (2000)

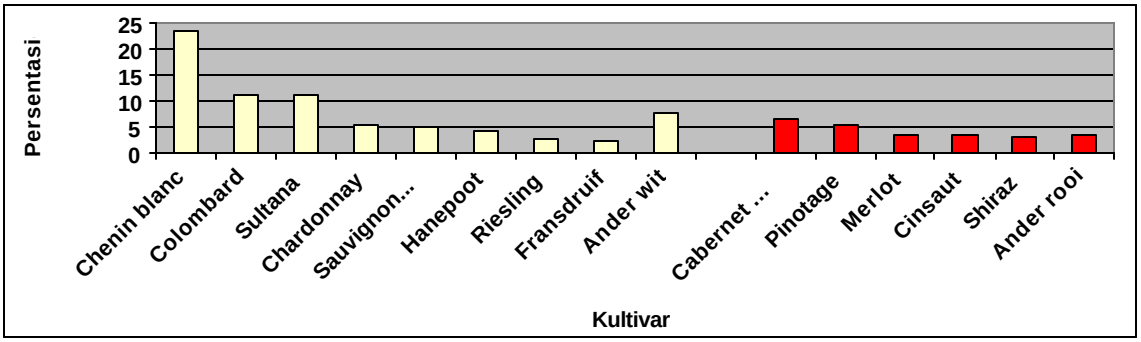
Every year approximately 1,2 million tonnes of grapes are pressed in South Africa. In 1999 the total vintage was 914 million litres of which 65% was used to make vintage wine (Table

1.2). Figure 1.1 illustrates that the greatest percentage of vintage wine is represented by obsolete white cultivars. The red to white wine ratio for vintage wines produced in South Africa is 16:84 – South Africa is therefore mainly a producer of white wines.

Table 1.2: Utilisation of the total vintage in South Africa

Year	Grape production (tonne)	Vintage wine (litre)	Rebate wine (litre)	Distil wine (litre)	Non-alcoholic (litre)	Total vintage (litre)
1997	1 120 602	546 688 605	142 354 553	122 413 493	69 458 508	880 915 159
1998	1 041 004	544 387 811	107 515 284	118 348 265	45 324 129	815 575 489
1999	1 173 596	595 907 559	47 972 702	152 961 143	117 254 086	914 095 490

Source: SAWIS (2000)



Source: SAWIS (2000)

Figure 1.1: Cultivar mix in the South African wine industry

Percentage

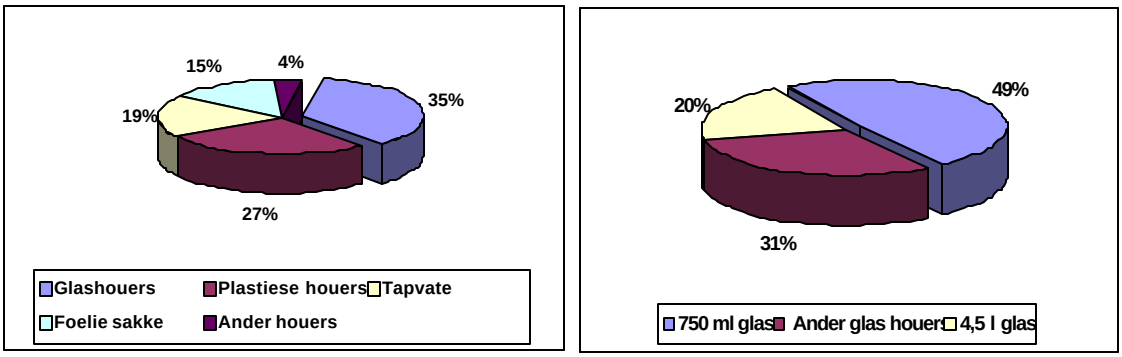
Fransdruif

Other whites

Other reds

Cultivar

If the assumption is made that wine sold in 750 ml wine bottles fetches a higher pirce, less that 20% of all wine produced in South Africa can be classified in the premium category. According to Figure 1.2, only 35% of all wine sold in South Africa in 1999 was sold in glass containers. Approximately half of all wine sold in glass containers was bottled in 750 ml wine bottles. Thus, only 18% of all the “vintage wine” enjoyed in the global market, of which red wine comprises 16%, was sold in 750 ml glass bottles.



Source: SAWIS (2000)

Figure 1.2: Classification of wine containers sold in South Africa – 1999

Glass containers

Plastic containers

Casks

Foil bags

Other containers

750 ml glass bottles

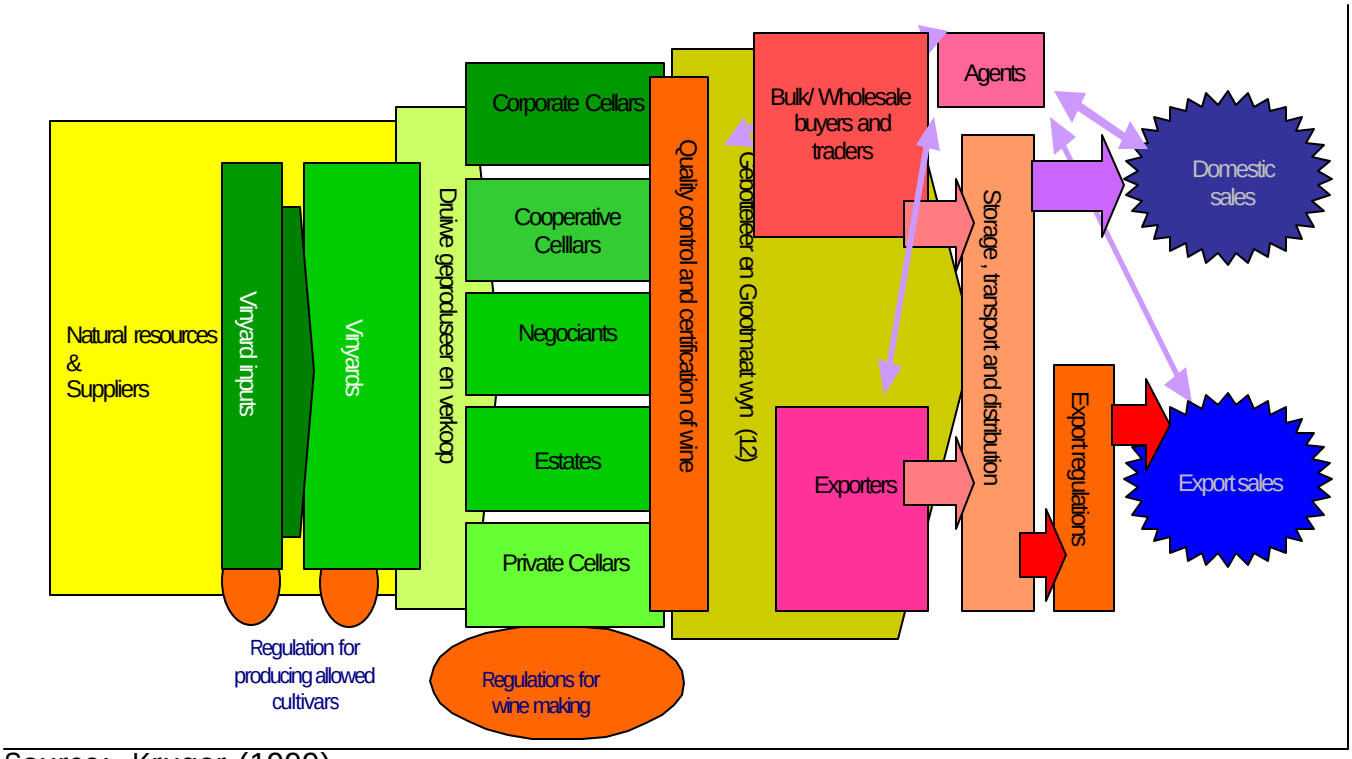
Other glass containers

4,5 l glass containers

2.4 Value chain structure in the South African wine industry

The structure of the value chain in the South African wine industry is extremely fragmented and the mix compares well with that of wine-producing countries in the old world (Figure 1.3). The fragmented nature of the South African wine industry became even more evident when the protection from market signals provided by the KWV and the co-operative system was removed. The value chain in the South African wine industry lacks a set of linked actions for production, marketing, distribution and storage (Kruger, 1999). Consequently, high-cost promotional activities that could promote the industry and establish a trademark – which are prerequisites in the highly competitive international market – are not supported.

Actions in the value chain are strictly regulated and quality control takes place through physical inspections and/or the testing of products at certain points. Although record-keeping is a regulatory requirement, it is limited to production factors, and market information is not readily available (Wine Strategy Task Force, 1999).

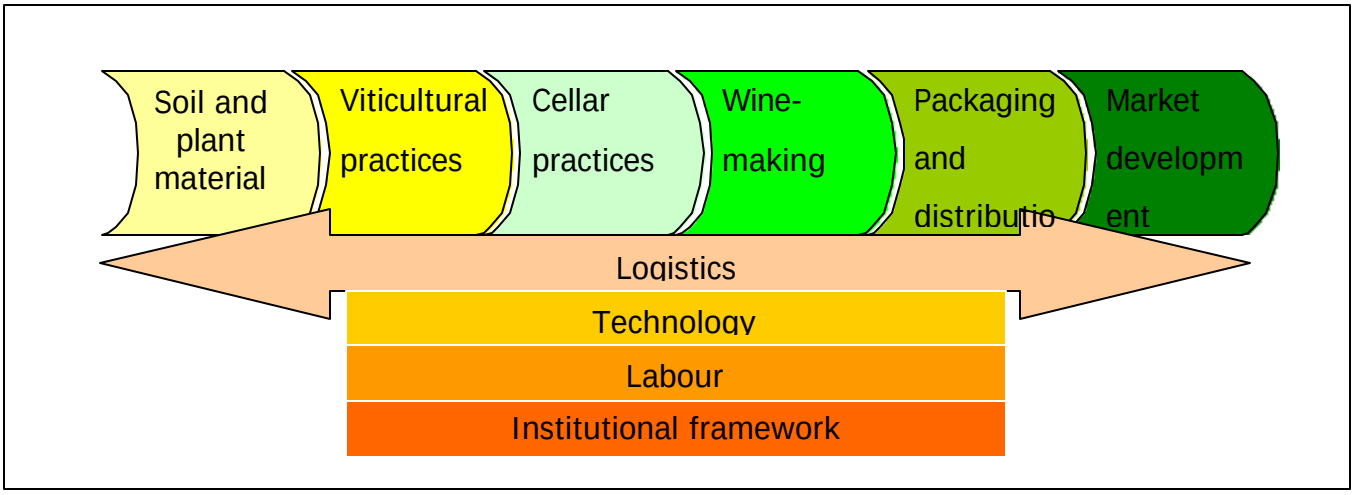


Source: Kruger (1999)

Figure 1.3: Composition of the South African wine industry

2.4.1 Primary activities in the value chain of the South African wine industry

The South African wine industry can be divided into the following six primary acitivities: soil and plant material, viticultural practices, cellar practices, wine-making, packaging and distribution, and market development (Figure 1.4).



Source: Adapted from Spies (2000)

Figure 1.4: Value chain in the South African wine industry

(a) Soil and plant material

The production potential of wine grapes is based on the integration of soil, climate and crop requirements. In South Africa, 104 179 hectares are currently under wine grapes (SAWIS, 2000). The South African wine industry uses two sources for the generation of plant material, namely local selection from existing vineyards, and imported plant material. After locally selecting or importing cuttings, the cuttings undergo a process of virus decontamination, followed by establishment in a nursery. They are then moved to a mother block, and finally to commercial nurseries where the cuttings are ordered by and sold to producers (Van Rensburg, 2000).

(b) Viticultural practices

Viticultural practices can be broadly divided into two categories, namely terroir and optimum practices. The concept 'terroir' includes climate, soil and slope choices for the establishment of wine grapes, while optimum vineyard practices include short-, medium- and long-term practices for managing the quality of grapes. The quality of grapes therefore depends on the correct choice of terroir supported by optimum vticultural practices.

(c) Cellar practices and wine-making

Cellar practices include all activities from when the grapes are offloaded at the cellar to the final product before bottling. The making of vintage wine requires stability and temperature control in the cellar, proper cellar hygiene as well as the correct technology and appropriate machinery. The layout and design of the cellar should also be adapted to the type of wine being produced. The process used by the wine maker to make the wine ultimately becomes part of the cellar's marketing strategy.

(d) Packaging and distribution

Wine is packaged in three formats, namely bottles, casks and foil bags. Packaging has two functions. Firstly, to protect the quality of the wine, which could be severely compromised if the wine is packaged incorrectly. Secondly, packaging influences the buyer's perception of the quality of the wine that he/she is buying.

(e) Market development and marketing

The market place comprises a collection of individual markets. The reasons why a specific bottle of wine meets a buyer's needs can be established through market research and suitable products and strategies can be developed to meet those needs. The quality of the wine, cultivar specificity, the price of the wine and its image play a decisive role in market development. South African wines are distributed locally as well as abroad. Although the local distribution network is reliable, South Africa is perceived internationally as not able to deliver its wine on time (SAWSEA, 1999).

2.4.2 Supporting activities in the South African wine industry

The six primary activities in the South African wine industry are supported and complemented by four supporting activities (Figure 4.6). Although the supporting activities are not directly

concerned with the wine-making process, they play a key role in the image of the South African wine industry. These four activities are: logistics, technology, labour, and the institutional framework in which the industry functions.

(a) Logistics

The process flow of grapes and wine requires a system that would provide the final consumer with a guarantee regarding the quality and integrity of the product. The effective flow of throughputs makes a significant contribution to the marketing costs in the chain.

Logistics are involved in all the links of the value chain and influence its effectiveness. In the value chain of the South African wine industry, logistics involve the provision, flow and maintenance of information, inventory, products, labour and facilities at every link in the value chain.

(b) Technology

Technology involves the creation of new knowledge. New knowledge in the South African wine industry is mainly generated by the Agricultural Research Council and the University of Stellenbosch. Once the knowledge is packaged and integrated, it is made available to the industry. Technology transfer in the wine industry takes place through various institutions, including VINPRO, the Western Cape Provincial Department of Agriculture, Distillers Corporation and Stellenbosch Farmers' Winery (the latter two institutions will soon be known as the "South African Wine and Distilling Company"). Due to the fact that a large number of institutions each focus on various parts of the value chain when it comes to technology transfer, technology does not reach the consumer as quickly as desired, while various institutions provide contradictory technology information flows (Van Zyl, 2000).

(c) Labour

Approximately 72 000 permanent employees are employed in the South African wine industry, ranging from workers in root-stock nurseries to people involved in the sales and distribution of wine. This excludes 45 000 seasonal labourers and 150 000 “informal” alcohol traders. Approximately 300 000 farm workers (dependants included) work in the industry, as well as 3 300 cellar personnel and 4 515 producers (SAWIS, 2000).

Regarding the racial composition of farm workers, the ratio of Coloured to black people is 90:10. The level of education of these workers is very low, which leads to a lack of productivity and requires strict supervision. As a result, formal management on farms is given less attention. Most of the producers have not yet implemented formal written contracts with labourers (Ewert, 1999).

The ratio of wine makers and trained viticulturists per hectare wine grapes is much lower in South Africa than in other new-world wine-producing countries. This affects the quality of wine produced and makes the industry internationally less competitive (Wine Stragegy Task Force, 1999).

(d) Institutional framework

There are four reasons why the wine industry will always be subject to government regulations even though the environment in which it functions has been deregulated. Firstly, regulations are required to ensure that the industry complies with international agreements. Secondly, intervention is necessary to ensure and maintain general consumer safety. Thirdly, regulation will always be part of any industry that sells alcohol and fourthly, regulations intended to conserve the environment are becoming increasingly important in all industries (Vink, 1999). The key question remains, however, whether regulations contribute to an internationally more competitive industry, or whether they obstruct international competitiveness.

3. Stakeholder opinions of the South African wine industry

3.1 Elements of success in the South African wine industry

Links in the value chain are interdependent. Producing wine of consistent quality from year to year and delivering it at the right time, at the right place and to the right market, require co-ordination between these links. Key elements for success in every link that ensure the production of good quality wine were identified by the Logistics Task Force of the Vision 2020 study.

3.1.1 Soil and plant material

- Cultivar mix should reflect market requirements
- Availability of plant material
- Guarantee of disease- and virus-free plant material
- Correct soil preparation
- Management of production costs
- Moisture retention ability of soil
- Choice of plant material must be a function of soil type (see viticultural practices).

3.1.2 Viticultural practices

- Market-linked choice of terroir (climate, soil and slope)
- Sound viticultural practices (plant density, trellising and irrigation systems, pruning, fertilisation programmes, pest and disease control)
- High-quality grapes
- Productivity
- Scheduling of vintage.

3.1.3 Cellar practices and wine-making

- Correct harvesting methods
- Classification of grapes
- Handling of grapes
- Machinery design must be adapted to the type of wine being produced
- Temperature control of grapes
- Sanitation and cellar hygiene
- Analysis and sensory testing of wine.

3.1.4 Packaging and distribution

- Reliable and correct information on label
- Durable packaging
- Air-tight packaging
- Guaranteed food safety
- Reliable delivery time
- Availability of wine.

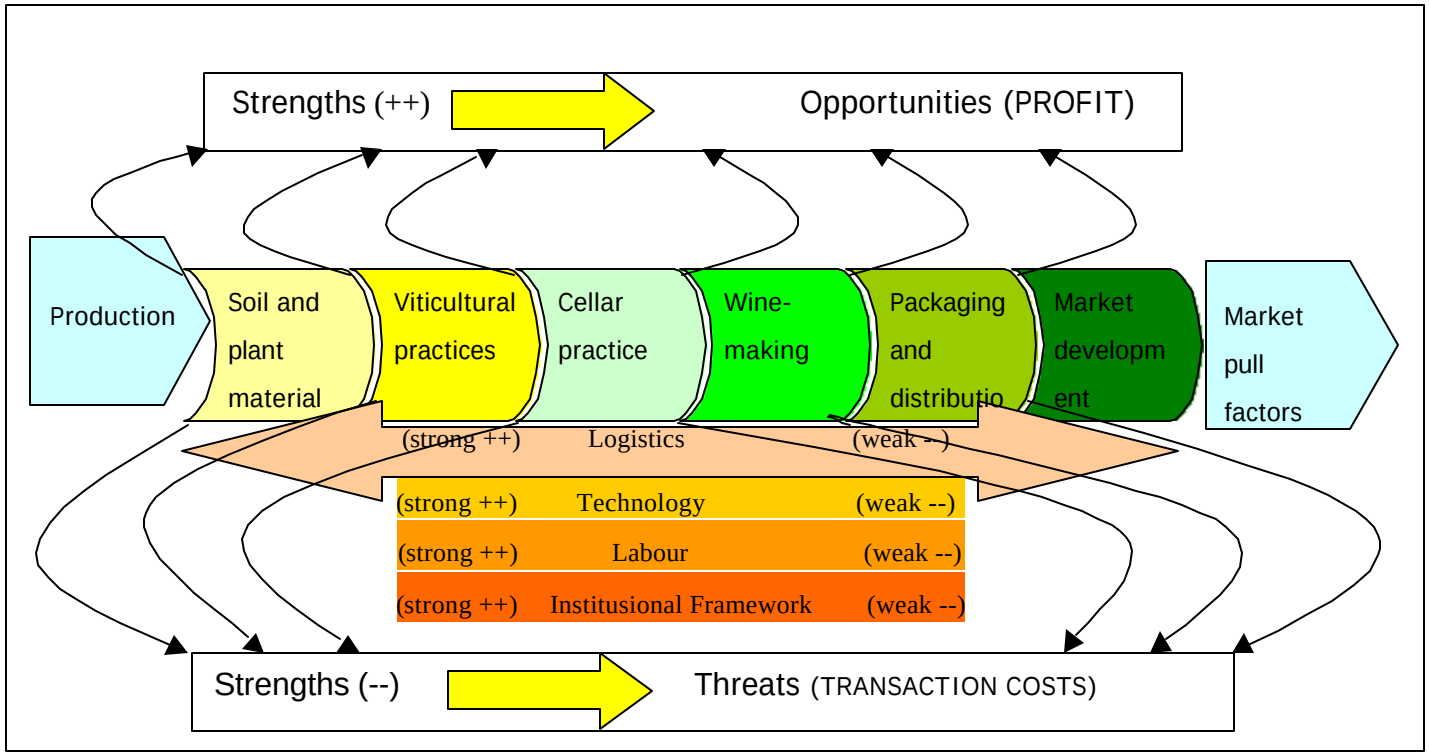
3.1.5 Market development and marketing

- Volumes of wine available
- Price
- Traceability
- Perception regarding quality, image and value of wine
- Consistent quality
- Product range mix.

3.2 Strengths and weaknesses of the South African wine industry

Although the South African wine industry is well positioned in terms of volume production in comparison with international competitors such as Australia, the USA and Chili, the quality of South African wines is perceived as lower, since only a small percentage of the vintage consists of noble cultivars. Despite the fact that product innovation is a slow process, which could adversely affect the industry, the South African wine industry still has a relatively competitive cost position compared to international competitors.

During the Vision 2020 study of the wine industry (2000), strengths (++) and weaknesses (--) for every link in the value chain of the South African wine industry were identified by technical committees. Figure 1.5 indicates where in the value chain these strengths and weaknesses occur.



Source: Adapted from Spies (2000)

Figure 1.5: Strengths and weaknesses in the the value chain of the South African wine industry

3.2.1 Soil and plant material

(++) The industry has the capacity to produce large volumes

(++) The production areas of wine grapes enjoy the benefit of a rich wine ecology which includes water, fertile soil and favourable climatic conditions

(++) A broad base of wine grape clones is available to the industry

(++) A large variety of soil types is available in a relatively small geographical area

(- -) Virus contamination has serious implications for plant material

(- -) There is no organisation that can take responsibility for determinin plant material needs

(- -) Some producers regard optimum terroir and cultivar combinations as unimportant.

3.2.2 Viticultural practices

(++) 99% of wine grape producers use an integrated system for wine production, which enables the sustainable conservation of natural resources in the environment

(- -) There is a noticeable shortage of premium cultivars

(- -) Re-contamination of virus-free material occurs throughout the industry

(- -) Production costs in the industry escalate due to an increase in capital expenditure for upgrading vineyards and implements, and labour costs.

3.2.3 Cellar practices

(++) The industry's cellar capacity is adequate for the production of large volumes of wine

(- -) Cellars in the industry have been designed to handle large quantities of wine and are not geared for producing quality wines

(- -) The majority of cellars do not have laboratory facilities

(- -) Systems within the cellars are poorly integrated (equipment).

3.2.4 Wine-making

(++) Advanced wine-making technology is available to the industry

(++) The industry has a broad range of producers and wine styles

(- -) Co-operative cellars mix high- and low-quality grapes, which results in the production of wine of mediocre quality.

3.2.5 Market

(++) The industry has relatively good economies of scale

(++) Wine from South Africa is still regarded as good value for money in some markets

(++) The industry has an established name in international markets due to a long history in traditional markets such as the UK, Western Europe and Canada

(- -) Compared to its international competitors, the industry does not generally invest in advertising and promotional campaigns

(- -) The industry does not have an established international trademark

(- -) Uncontrolled exports of poor quality wine is harming the industry's image.

3.2.6 Packaging and distribution

(++) Producers are well represented in the most important markets in Western Europe and exports are still growing in import-dependent markets

(- -) The packaging of wine in cheap plastic containers and bags is harming the industry's image

(- -) The industry's packaging regulations are in conflict with the European Union's requirements.

3.2.7 Logistics

(- -) The industry does not have a clear operational strategy to guide its development. This is due to a low level of strategic and market co-ordination between producers and exporters

(- -) The industry is geographically far removed from the most important international wine markets

(- -) The distribution channels of agencies are used for international marketing and distribution, which means that total control of the distribution channel is lost

(- -) Information flow from the market back to the producer on the farm is extremely slow

(- -) Internationally, the industry's most important competitors are regarded as more dependable, since they are able to guarantee the delivery times of their wines.

3.2.8 Technology

(++) The industry is characterised by well-developed viticultural training, supported by a research institute

(++) The structures for technology transfer are in place

(- -) There is a low level of product innovation in the industry

(- -) Research results are not practically implemented in the industry

(- -) A lack of funds limits the generation of technology for the industry.

3.2.9 Labour

(- -) The industry is hampered by a low level of human resources development

(- -) Relationships between farm labourers and employers have not been formalised

(- -) The industry is experiencing a lack of qualified wine makers

(- -) The industry is characterised by a severely skewed racial composition.

3.2.10 Institutional framework

(++) The strict legislation which regulates wine production makes for careful quality control

(- -) Strict legal requirements govern certification for local and international markets. The process requires minimum set periods which are time consuming and results in orders not being delivered on time.

(- -) The industry does not receive a satisfactory level of support from the government

(- -) Uncertainty surrounds the government's agricultural policy.

4. Analysis of transaction costs in the value chain of the South African wine industry

4.1 Transaction cost theory

In transaction cost economics, the fundamental unit of analysis is those transations that take place in markets and organisations (Douma & Schreuder, 1992). Value chain efficiency is influenced by the transaction costs that occur throughout the chain. Transaction costs refer specifically to the costs of (i) price discovery, (ii) contract negotiation for every transaction, and (iii) the exact specifications of a transaction (Hobbs, 1996).

Pro-active steps to improve management in the value chain are fundamentally concerned with improving effectiveness in order to gain a competitive advantage (Hobbs, 1996). According to Benham and Benham (1998:1), transaction costs in a value chain "affect what is produced and what exchanges take place in the market; they affect which organisations survive and what rules of the game persist".

For the purposes of this study, Hobbs's theory of transaction costs is used: "Transaction costs are simply the costs of carrying out any exchange, whether between firms in a marketplace or a transfer of resources between stages in a vertically integrated firm. These costs arise

wherever there is any form of economic organisation, i.e. within a vertically integrated firm, in a market or in a command economy ...” (Hobbs, 1996:17).

4.2 Classification of transaction costs

Various disciplines, including psychology, political science, economic history and law have contributed to the theoretical development of transaction cost analysis. Based on these disciplines, Hobbs (1996) identifies four key concepts that underpin this analysis.

4.2.1 Bounded rationality

Although it might be the intention of a person or an organisation to make a rational decision, their capacity to evaluate all possible alternatives is physically limited (Simon, 1961). In extremely complex or uncertain situations, the ability of people or organisations to make rational decisions will be impeded, i.e. bounded rationality will occur.

4.2.2 Opportunism

Opportunism is defined by Williamson (1979:234) as: “self-interest seeking with guile”, i.e. it recognises the fact that some organisations and individuals will seek to exploit a situation to their own advantage. Although this does not imply that everybody involved in a transaction will act opportunistically all the time, it recognises that the risk of opportunism is present. The risk is greater if the number of alternative suppliers is limited. The smaller the number of suppliers available to the buyer, the greater the chances that they could act opportunistically and alter the terms of a transaction to their own advantage, such as demanding a higher price than that previously agreed.

4.2.3 Asset specificity

Asset specificity refers to the degree to which an asset can be redeployed for alternative uses and alternative users, without sacrificing its productive value (Peterson & Wysocki, 1998).

Asset specificity arises when a partner (Company A) makes a large investment in resources that have little or no value in an alternative use. An example might be the installation of specialised machinery in a production plant, or the development of a product which is unique to one market.

Company A then faces the risk that its trading partner (Company B) will act opportunistically, since Company B is well aware of the fact that Company A has made an asset-specific investment and is therefore locked into the transaction. Company B could for example renege on the original agreement by offering Company A a lower price for the product.

4.2.4 Informational asymmetry

Information asymmetry acknowledges the fact that business negotiations are characterised by incomplete, imperfect or asymmetrical information.

Information asymmetry arises when public information is available to all parties, but private information is available to selected parties only, i.e. all parties to the transaction no longer possess the same levels of information. This asymmetry leads to *ex ante* and *ex post* opportunism. *Ex ante* opportunism means information is hidden prior to a transaction. This adversely affects other parties involved in the transaction, and is also known as adverse selection. In the case of *ex post* opportunism, a moral hazard arises from information asymmetry, because of the hidden actions of individuals or organisations. These parties may have the incentive to act opportunistically to increase their economic welfare bacause their actions are not directly observable by other parties (Hobbs, 1996).

4.3 The implications of transaction costs generated in the value chain

Table 1.3 identifies 34 problems which generate transaction costs in the value chain of the South African wine industry, and the implications of these costs for the industry.

Table 1.3: Transaction costs in the value chain of the South African wine industry, and their implications

Problem	Transaction costs	Implication
Soil and plant material		
Virus contamination	Bounded rationality	• Lower yields • Sub-optimal ripening • Shortened plant life
Climatic conditions	Bounded rationality	• Yield fluctuates • Quality fluctuates
High establishment costs	Asset specificity	• High replacement costs
Culitivar mix	Information asymmetry	• Low demand for wine • Shortage of preferred cultivars
Viticultural practices		
Ill-considered choice of terroir	Opportunism	• Poor quality wine • Low prices
Over-production per ha	Opportunism	• Poor quality wine • Industry's image suffers
Choice of plant density, planting direction and trellising system	Asset specificity	• Once-off choices which cannot easily be reversed
Cellar practices		
Co-operative system	Opportunism	• Support production rather than quality • Lack of compensation for quality ("free rider" problem)
Cellar design	Asset specificity	• Few alternative uses for cellars

Wine-making practices		
Limited access to laboratories	Information asymmetry	• Variation in quality and taste of wine
Changing consumer preferences	Bounded rationality & asset specificity	• Cultivar mix differs from demand in the market
Shortage of qualified winemakers	Information asymmetry with reference to competitors	• Large variation in quality of wine
Packaging and distribution		
Use of the term "Product of South Africa"	Opportunism	• Industry's image is adversely affected
Limited suppliers of packaging material (monopoly arises)	Opportunism	• Poor availability • High prices due to limited competition • Poor quality
Market development and marketing		
Fluctuations in exchange rate	Bounded rationality	• Fluctuating income and expenditure projections
Changing market prices	Bounded rationality	• Inaccurate projections
Receptiveness of market	Bounded rationality	• Results in too little wine of one kind being produced and too much of another, which leads to shortages and surpluses
Ignorance with regard to price nodes at which wine is sold	Information asymmetry	• Prices that are too high • Prices that are too low
Slow flow of market information	Information asymmetry	• Wrong cultivar mix
Availability of market information	Information asymmetry	• Planning becomes problematic
Logistics		
Independable delivery schedule	Opportunism	• International buyers levy premium due to independability of delivery time
Transport containers for grapes and tanks for wine	Asset specificity	• Few alternative uses
Poor vintage scheduling	Information asymmetry	• Quality of grapes decline due to poorly scheduled harvesting activities

Technology		
Intellectual property	Asset specificity	• High generation costs; few alternative uses
Laboratories	Asset specificity	• Established interests in staff and training
Technology transfer	Information asymmetry	• Implementation of technology too slow
Dependence on government funds	Information asymmetry	• SA wine industry develops at a slower rate than its competitors
Labour		
Unstable labour market	Bounded rationality	• Industry's progress is hampered
Unemployment	Opportunism	• Over-supply of workers often results in very poor working conditions for labourers
Low literacy levels of farm labourers	Information asymmetry	• Hampers development • Management problems • Gaps in communication
Entrepeneurship	Information asymmetry	• Rigid thinking of some role-players hampers industry's development
Institutional framework		
Ekonomic instabilty	Bounded rationality	• Fewer foreign investments
Uncertain land reform policy	Bounded rationality	• Hampers the growth of the industry
International trade agreements	Bounded rationality	• Influences future developments

Source: Conclusions of technical committee meetings during the Vision 2020 study

4.3.1 Bounded rationality in the South African wine industry

South Africa has a broad spectrum of climatic zones in a relatively small geographical area. To produce good quality wine, one needs to grow good quality grapes. Climatic conditions directly influence the annual quality and yield of grapes. Although producers attempt to optimally manage the quality of grapes from year to year, man's inability to manage the macroclimate results in physical limitations to the accuracy of decisions. This results in costs to producers in the form of lower prices for grapes of lower quality. These costs are not unique to the South African wine industry, but once again emphasise the importance of suitable terroir choices in order to minimise the risks of bounded rationality.

Virus contamination is an epidemological process whereby viruses can be passed on from mother to offspring and/or through vectors from an infected carrier to healthy plants. The actual extent of virus contamination is very difficult to quantify. A questionnaire distributed to VINPRO consultants (industrial viticulturists) in each of the eight KWV regions indicated that virus contamination fluctuated between 5% and 20%, depending on climatic conditions in the relevant region, but that it was as high as 60% in the Stellenbosch area (VINPRO Questionnaire, 2000).

The impact of virus contamination includes a reduction in the lifespan of vines, a decline in yield, and grapes that never ripen optimally. Thus costs are generated for the producer and indirectly for the industry in the form of a loss of production due to lower and less regular yields, and grapes of a lower quality that have to be sold at lower prices. Vineyards have to be replaced more frequently and the making of top quality wines is hampered by grapes that do not ripen fully. A further cost attributable to virus contamination is ignorance of and uncertainty about the way in which viruses are transferred, which leads to bounded rationality during decision-making.

In 1999 the South African wine industry exported about a quarter of all vintage wines produced. The industry is therefore to a large extent dependent on the international market. The constant fluctuation in the value of the rand coupled with changing market prices, however, leads to changing income and expenditure projections which increase uncertainty and risk. The fact that sea freight is quoted in US dollar further compounds the problem. This uncertainty as a result of limited rationality is not limited to the producer, but affects everybody involved in the export process.

The uncertainty caused by changing market prices results in an over-production of some wines and an under-production of others. Over-production of some wines leads to surpluses which have to be sold at lower prices. This has a physical implication for both the exporter and the supermarket. Bounded rationality of this nature will always be part of the industry, but can be managed if information is fed back freely and timeously along the chain. The

degree of uncertainty surrounding transactions could be reduced by close co-operation and negotiation between the industry and international supermarkets by making information mutually available.

One of the South African wine industry's most important challenges in the next decade is to become internationally more competitive. Competitiveness is a minimum requirement for survival in the international market. Uncertain land reform principles and economic instability hamper the growth of the industry. This leads to fewer foreign investments, which in turn affect the future development of the industry. In order to reduce bounded rationality and its associated costs, it is important for the future of the industry to be given absolute clarity about the government's land reform principles.

4.3.2 Opportunism in the South African wine industry

Opportunistic behaviour occurs whenever an individual uses a situation to his/her own advantage at someone else's expense. South Africa's climate, especially the warmer irrigation areas, are well suited for the production of wine grapes. However, there is a direct correlation between the quality of grapes and the quantity of grapes harvested per hectare. The more grapes harvested per hectare, the lower the quality of the grapes. Opportunistic behaviour by some role-players in the industry who select to produce large volumes of grapes at the expense of quality, and then attempt to sell the wine as vintage wine because the commodity price for wine is very low, generate costs for producers of vintage wine. Producers of vintage wine specifically manipulate their vineyards to ensure low yields and grapes of high quality. These producers are then confronted by opportunistic behaviour which harms the image of vintage wine and undermines confidence in the industry. If the South African wine industry wants to link its image to wine of quality on all levels, the industry itself must take responsibility for putting a stop to the opportunism of certain role-players.

The re-entry of the South African wine industry into the international market resulted in a great demand for South African wine. The industry was however not prepared for this occurrence, and immense expansions of vineyards followed. Opportunistic behaviour by

producers led to ill-condisered mixes of cultivar plantings in climatic areas and soil types that were unsuitable for the cultivation of certain cultivars (Wine Strategy Task Force, 1999). In many instances poor, uncertified plant material was planted in soil not suitable for the cultivation of grapes. This generated – and still generates – costs for the industry, since these grapes are of a very low quality and not suitable for the making of vintage wine.

The 69 co-operative cellars in the South African wine industry handle 84,4% of all grapes pressed in the industry (SAWIS, 2000). The heavily regulated past of the South African wine industry encouraged and compensated the production of large volumes of low-quality wine. All members of a co-operative received similar compensation, regardless of the quality of their product. Undifferentiated "pools" consisting of few, but large, tanks are the central elements in the co-operative production line. Opportunistic behaviour by members resulting in the production of large quantities of low-quality wine generates costs for the industry, since this wine fetches low prices in the market. There is also a cost component involved for the producer who does deliver grapes of good quality, since his good quality wine "disappears" in the bulk of low-quality wine.

The South African wine industry has limited suppliers of packaging material, specifically glass bottles. Consequently, the availability of glass bottles is accompanied by long delays, and due to limited competition and opportunistic behaviour, the quality of bottles is very low. This limitation means that South Africa's reputation as a timeous and dependable supplier of wine is adversely affected, which results in a decreased demand for South African wines.

All wines leaving South Africa, either bottled or in bulk to be bottled overseas, are certified. It is a legal requirement that the words "Product of South Africa" appears on the bottle's label (Wine and Spirits Board, 1998). Opportunistic behaviour by individual role-players generates costs for the industry as a whole because wine that is locally certified as distil wine, is exported and then sold as vintage wine under the banner of "Product of South Africa". This causes incalculable damage to the present and future international image of the South African wine industry.

Unemployement in South Africa is a huge problem. Since work is very scarce, labourers are often paid less than the permissible minimum wage, and working conditions are very poor. Opportunistic behaviour of this nature by some employers limits the development of people and the advancement of the South African wine industry. It leads to poor labour relations that stimulate low productivity in the industry. It is important for healthy labour practices that make provision for the upliftment and development of people to become part of the South African wine industry, since large international supermarket chains will in future exert more pressure to ensure the ethical and fair treatment of employees.

South Africa's wine industry has earned the reputation of being unable to guarantee the delivery times of its wine. Because prompt delivery cannot be guaranteed, international wine buyers are turning to more reliable suppliers of wine. Lost opportunities generate enormous costs for the wine industry. The lack of dependability also damages the image of the industry, which is then opportunistically exploited by buyers who force the prices down.

4.3.3 Asset specificity in the South African wine industry

The replacement costs of a hectare of wine grapes is immensely high, and the plant density, planting direction and trelissing system in a vineyard are once-off choices. Once these choices have been made and implemented, they cannot easily be reversed. High replacement costs hamper the tempo at which the current cultivar mix in the industry can be changed. If the market for wine grapes or a specific cultivar should suddenly weaken, the owner (private or company) would find himself in a position where a large amount of capital has been invested in something with little or no alternative use (on average vineyards only break even after seven years) (VINPRO, 2000). Similarly cellars, transport containers and wine tanks are asset specific, since they have few alternative uses that could benefit the owner.

The owner of an asset-specific investment is vulnerable to the opportunistic behaviour of a partner in the chain, since the owner would not be in a position to exercise any power. An example is where producers with outdated cultivar mixes on their farms find it difficult to sell their grapes. Cellars are under no obligation to buy these grapes, which results in cash-flow

problems for the producer. Problems of this nature can be avoided by concluding formal contracts with the various various role-players in the chain.

One of the problems in the South African wine industry is the accessibility of laboratories to wine cellars. Laboratories that are specifically equipped for the making of wine are extremely expensive and asset specific. Training laboratory staff is also a costly process. Since laboratories have limited alternative uses, a laboratory carries a high asset-specificity risk for the owner. Co-operation in the value chain of the South African wine industry is therefore essential to ensure that all cellars have access to laboratories without building unnecessary laboratories, which would increase transaction costs in the industry.

4.3.4 Informational asymmetry in the South African wine industry

The current cultivar mix in the South African wine industry is the result of incomplete information, which causes information asymmetry in the industry. Although part of the industry received market signals from global markets, the majority of the industry did not (or did not react), which led to an obsolete cultivar mix of predominantly white cultivars. This information asymmetry in the industry results in a poor demand for the wine that is currently being produced, and a high demand for preferred cultivars (noble cultivars).

This results in a cost to the industry in the form of lost opportunities; the same inputs could have been used to produce a product for which there is a high demand, and higher prices could have been realised on the international market. That part of the industry which received the information and adapted their product mix according to the market's demands, has realised a significantly higher income that the part which did not receive the information.

The market demands wine of consistent quality. If producers want to consistently produce wine with similar characteristics (fragrance, colour, taste), all cellars should have access to their own laboratories. An information asymmetry exists between cellars, since some cellars are equipped with laboratory facilities and others not, which generates costs in the industry.

South Africa has far fewer qualified wine makers per hectare than its largest international competitors (Wine Strategy Task Force, 1999). The country's re-entry into international markets stimulated a sudden growth in the South African wine industry, but the training of qualified wine makers did not follow suit. Consequently there is a large variation in the standard of wine makers due to varying the levels of training, knowledge and experience. The information asymmetry that exists between wine makers leads to wines of varying quality being produced every year. This is detrimental to the image of the industry, since the consumer demands a guarantee of consistent quality. Consequently, the industry has to bear the cost of a decline in exports and lower prices in the international market. To counteract this problem it is important that the industry sets itself a minimum standard for the production of quality wine.

The poor scheduling of vintages is a further result of incomplete information to producers. As mentioned above, the making of quality wine depends on growing quality grapes. The poor scheduling of harvesting activities leads to poor quality grapes which generates costs for the cellar, since wine of a poorer quality fetches lower prices.

Farm labourers in the South African wine industry have a very low level of literacy. A study undertaken by the Cape Wine Academy (1999) found that 60-70% of farm labourers are illiterate. This implies slow development and barriers to communication, which result in management problems. Costs by means of information asymmetry is generated in the industry when poor communication leads to incorrect practices on the farm and in cellars. The wrong labour practices result in lower yields, lower quality grapes and a lack of productivity, which increase costs in the industry.

Much of the technology generated every year is never implemented in the industry, since technology transfer takes place very slowly. Generating technology is a very expensive process, which is largely financed by the industry itself. If the technology being generated is not practically implemented due to an information asymmetry between researchers and the users of technology, large amounts of money are wasted and the industry becomes internationally less competitive.

5. Strategic options for making the value chain of the South African wine industry more market-oriented

- Focus the entire value chain in the South African wine industry on an operational chain which consists of strong, profitable and sustainable links, with the best possible practices in every link.

- Guarantee wine products of consistent quality at various price nodes to increase the international competitiveness of the South African wine industry.

- Move away from a production-driven wine industry to a market-driven wine industry where client and consumer choices determine what is a product of quality.

- Develop industry guidelines which determine preferential regions for particular cultivars. Cultivar adjustments on their own are not sufficient for quality production; careful attention should be paid to the suitability of a particular cultivar to a specific region.

- Pay specific attention to the development of strategic plant material, giving high priority to virus-free plant material.

- Maintain the focus on the production of wine, distillates and juice throughout the industry. Although wine, distillates and juice are all products of the vine, cross-subsidies among these three sectors of the South African wine industry should be avoided.

- The South African wine industry should be ethical and socially responsible in its conduct by following and promoting environmentally friendly practices.

- Develop and transfer techology in the wine industry, which is directed by changes in the market.

- Develop more laboratories in the wine industry to increase access to chemical analyses. The industry as a whole should be able to guarantee quality year by year.

- Do away with products that damage the image of the South African wine industry in the local and international markets. Cheap packaging and bulk exports of poor quality wine do not benefit the image of the South African wine industry.

- Develop as an integral part of the industry a logistics system directed at and managed by the market, and driven by information.

- Establish integrated, purpose-built programmes that offer continuous education and training to labourers in the South African wine industry.

- The industry should adopt an official stand which promotes the responsible use of alcohol, supports the government's economic objectives and emphasises the value that the industry adds to employees and communities in the industry. It is essential that this is supported by key role-players in the industry.

- Develop a market-driven industrial intelligence and information system that will help to manage the orderly development of the industry in the future.

- If the aim of the South African wine industry is the development of a strong, profitable and sustainable value chain, the key skills in the chain should be linked with suitable markets.

- Move away from central statutory management to decentralised, information-based control.

- Aggressively start developing a trademark, not only in the context of market development, but also in the context of changes in the structures of the industry in order to establish economies of scale for trademark development.

6. Conclusions

The South African wine industry today is exposed to a new set of global demands which will determine its future. The quality of products, services and people is determined by the choice of the international consumer.

Strategies alone will not ensure the overnight transformation of the wine industry's value chain into a chain of wealth. The fragmented nature of the value chain, the set ideas of some of the role-players and the international image of the industry demand strong leadership and focused actions if the industry wants to become internationally more competitive (Spies, 2000).

In addition to establishing a certain degree of co-operation, it is essential that role-players in the industry realise that a healthy value chain as a whole will determine the future of the South African wine industry. Becoming internationally competitive requires the industry to act in an enterprising and innovative manner and apply best practices at every link in the value chain. Furthermore, interactions between role-players in the value chain should be effectively and efficiently integrated.

Growth in export volumes depends on the degree to which the international image of the industry can be improved, supported by a stable political and economic environment locally. No only should every link in the value chain be client-driven, but the value chain should be sructured to allow information from the market to reach the producer timeously – from a product-driven to a market-driven chain.

The basic ingredients for success are present in the South African wine industry. Suitable natural resources, an outstanding wine ecology, good wine makers, research and development programmes and developed trade in the value chain will enable the South African wine industry to firmly establish itself as an international wine-producing country. However, this would require integrity, co-operation and confidence at every link of the value chain.

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