LINKING SMALL-SCALE FARMERS TO AGRIBUSINESS:

THE ECONOMICS OF CONTRACTING

by

Kurt Sartorius

Submitted in partial fulfilment of the requirements for the degree

DCom

in the

Faculty of Economic and Management Sciences

University of Pretoria

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July 2003

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LINKING SMALL-SCALE FARMERS TO AGRIBUSINESS: THE ECONOMICS OF CONTRACTING

By

Kurt Sartorius

Degree: DComm

Department: Agricultural Economics, Extension and Rural Development

Promoter: Professor Johann Kirsten

ABSTRACT

The globalisation of markets and the industrialisation of the farm sector have profoundly influenced the structure and performance of agricultural supply chains. Whilst, the opportunities of an expanded range of market niches for farmers is evident, the requirements for size and continuity, in many instances, preclude smaller farmers in developing countries. The principal research question addressed by this study is, whether or not, small-scale farmers in developing countries can be linked to agribusiness partners by way of a contracting arrangement in order to take advantage of some of the opportunities presented by the new paradigm. This study proposes that a " fresh approach" to the design of smallholder contracting models can be adapted. This approach incorporates combining the lessons of history, the use of the new institutional economic theory and a case study methodology to form the basis for the design of a proposed contracting model. Two case studies are employed to test the research questions. The first case study involves two smallholder contracting arrangements in the Swaziland and South African sugar industries. The second case study is an example of contracted micro-growers in the South African timber industry. The results of the study are as follows: Firstly, the transaction characteristics of the surveyed grower-processor supply operations appeared to influence the governance structures required by their agribusiness partner to co-ordinate the respective activities. Secondly, the results suggest that the transaction

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cost of raw commodity supply chains is a function of historical, social and physical variables in the prevailing institutional environment. Thirdly, the results demonstrate that smallholders generate incremental transaction cost for the agribusiness partner in comparison to larger suppliers. The reasons for this primarily include the differential levels of start-up cost, as well as, the need for incremental levels of agribusiness inputs with respect to the growing, harvesting, delivery and administration activities involved. Fourthly, the results suggest that smallholders can compete with larger growers with respect to the cost efficiency of production. The principal reason for the competitive performance of the smallholders was a result of contracting out for facilities costs as opposed to the internalised nature of this cost in the agribusiness operations. Finally, the case studies appeared to confirm that the institution of contracting has allowed large numbers of small-scale farmers to overcome the barriers of entry to certain industrial crops. A series of proposals for the design of a smallholder agribusiness contract farming model were then developed. The study developed the proposed model on the basis of assuming that a smallholder contracting arrangement can be treated as a strategic investment decision. The model, therefore, configures the contract farming investment decision into the strategic process. A key feature of the model is the use of activity based costing in order to trace differential transaction cost to the contracted growers. The proposed model can, therefore, highlight the differential cost of smallholder contracting or the cost savings of a farmers' association. The identification and quantification of incremental smallholder cost can be used by agribusiness as a basis to lobby the state for assistance with respect to start-up cost or, alternatively, as a basis to charge back incremental cost to the contracted growers. The study concludes that smallholders can be linked with agribusiness on an economic basis but only if measures are taken to reduce incremental transaction cost.

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DECLARATION

I declare that this thesis is my own work. It is submitted for the degree of Doctor of Commerce to the University of Pretoria, Pretoria. It has not been submitted before for any other degree or examination in any other university.

Kurt Sartorius
July, 2003

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DEDICATION

To my wife Hetty, Benn and Lana
You are my world

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ABBREVIATIONS AND ACRONYMS

ABC	Activity Based Cost
MCS	Management Control Systems
ROCE	Return on Capital Employed
TCE	Transaction Cost Economics
OS	Organisation Structure
TC	Transaction Characteristic
SSA	Swaziland Sugar Association
SSMA	Swaziland Millers Association
MCS	Management Control Systems
SCGA	Swaziland Growers Association
MSCO	Mhlume Sugar Company (Swaziland)
EU	European Union
US	United States
SACU	South African Customs Union
SADC	Southern African Developing Countries
NFA	Nyakafto Farmers Association
VFA	Vuvulane Farmers Association
SACA	South African Cane Growers Association
SAMA	South African Millers Association
TSB	Transvaal Sugar Company

Chapter One: Introduction

1.1 Background

The purpose of this study is to contribute, from an agribusiness perspective, to the design of agribusiness-small-scale farmer contracting partnerships in South Africa. This study will attempt to demonstrate that contracting, modified to suit country and commodity specific conditions, can be used as a vehicle to overcome the historical legacies of the South African agricultural sector. More specifically, this study will attempt to demonstrate that the institution of contracting can be used as a mechanism to overcome the barriers of transaction cost, technology, competition, low prices, the inelasticity of demand and the inherent instability of agriculture, as suggested by Bonnen & Schwiekhardt (1998). The need to design new approaches to link small-scale farmers and agribusiness is underlined by the changing nature of farming. The modern agricultural sector is, increasingly, changing from an industry dominated by family farms, to one that is characterised by larger, industrialised firms that are more tightly aligned across the supply chain (Boehlje, 2000). The dilemma facing small-scale farmers in many developing countries is that, despite the opportunities that have emerged as a result of the industrialisation of agriculture, they are confronted by the possibility of being marginalised as a result of the changing structure and requirements of the farm sector.

The increasingly industrialised nature of agriculture is thought to be largely the result of biological and information technologies (Schrader, 1986), economic growth, mechanisation, the increasing scale of organisation and the modernisation of production, processing and distribution systems (Sofranko *et al*, 2000). Drabenstott (1995) argues that there are two powerful forces driving this process of industrialisation: a new consumer and a new producer. The new consumer is typified by high levels of product specific requirements, whilst the new producers are equipped with modern technology and management tools that enable them to engineer food from farm to table. Furthermore, increased levels of processing, improved productivity, new technology and market forces have expanded the range of products (Von Braun & Kennedy, 1994; Royer, 1995) that are customised and aimed at separate market niches (Davis & Langham, 1995; Drabenscott, 1995; Fronmueller & Reed, 1996; Boehlje, 2000). Food production has, thus, become an industrialised,

vertically integrated, capital intensive business, that operates in a highly competitive and unpredictable global market (Reardon & Barrett, 2000) which is relatively inelastic and is confronted with increasing levels of supply (Huffman & Just, 1994; Meliczek, 2000).

Increased levels of vertical co-ordination have been a crucial feature of the industrialisation and globalisation of agriculture (Williams, 1985;Watts, 1994; Von Braun, 1994; Eicher & Staatz, 1998). Vertical co-ordination, in general, can be likened to a value added partnership (VAP), or a loose form of vertical integration that exists in many business sectors. This institution includes a set of independent partners that work closely together to manage the flow of goods and services along the entire value added chain (Glover, 1984; Johnstone & Lawrence, 1988). In the agricultural sectors of developed countries this structural response has, mostly, been related to a profit motive (Royer, 1995; Pasour, 1998) where a central objective includes the structuring of the organisation in its most efficient form (Frank & Henderson, 1992; Mahoney, 1992; D'Aveni & Ravenscroft, 1994; Aust, 1997; Rehber, 1998; Pasour, 1998; Sofranko et al, 2000). The need for economies of scale, product differentiation, increased levels of co-ordination, combined with the need to develop and protect technology, are thought to have contributed to the higher levels of vertical co-ordination (Rhodes, 1993; Royer, 1995; Pasour, 1998). Agriculture has, therefore, experienced a move away from open market production and has become increasingly vertically co-ordinated with agribusiness, in order to produce a greater range of high quality differentiated products (Babb, 1992; Sporleder, 1992; Royer, 1995; Peterson & Wysocki, 1998; Pasour, 1998; Pritchett & Liu, 1998 Goodhue, 1999; Sofranko et al, 2000). This structural change has resulted in fewer, larger farms and the concentration and specialisation of farming (Schrader, 1986; Frank & Henderson, 1992; Rhodes, 1993; Ling & Liebrand, 1995; Pasour, 1998).

There has also been a widespread increase in the incidence of vertical co-ordination in many developing countries (Eicher & Staatz, 1998). However, unlike developed countries, the increased levels of vertical co-ordination in developing countries have been pursued for both equity and economic reasons (Glover, 1984; 1987;1994, Von Braun & Immink, 1995; Little, 1994; Watts, 1994). Contract farming, in this regard, has been cited as an important vehicle to contribute towards development in Sub

Saharan Africa (Eicher & Staatz, 1998; Coulter et al, 1999). The rapid growth of vertical integration in developing countries can be partially explained by growing food dependence, the need to generate foreign exchange (Little & Watts, 1994) and as a means to industrialize and restructure agriculture (Goodman, Sorj & Wilkinson, 1987). Moreover, contracting has been seen as a way to modernize traditional production systems (Vergopolous, 1985; Binswanger et al, 1993), a means to provide missing or imperfect markets (Runsten & Key, 1996; Delgado, 1999) and, finally, as a vehicle to achieve the restructuring of the demographics of ownership of the agricultural sector (Glover, 1984; Glover, 1987; Watts, 1994; Rehber, 1998). The use of contracting, however, has been associated with the exploitation of farm labour, family conflict, loss of farmer independence, land degradation and the increased production risk of non traditional crops (Little & Watts, 1994;Key & Runsren, 1999).

Recent developments in economic theory, like the new institutional economics, have contributed to a better understanding of the managerial economics of the firm. These studies have revealed crucial new insights into the economic rationale for higher levels of managed co-ordination as a choice of governance structure to co-ordinate the activities of the firm (Petersen & Wysocki, 1997; Wysocki & Petersen, 1998). The structural changes in industry are, in this respect, matched with higher levels of recognition of the importance of the economics of organisational architecture (Brickley et al, 2001). Various empirical studies in the United States, for instance, have concluded that vertical co-ordination strategies are the result of transaction cost economies where the most influential transaction characteristics are uncertainty, input supplier concentration, asset specificity and internalisation costs (Frank & Henderson, 1992). Finally, idiosyncratic investments, asymmetric information and the costs of administering contractual relationships are seen as additional factors explaining the economics of vertical co-ordination (Joskow, 1988; Royer, 1995; Pasour, 1998).

In the process of stimulating agrarian transformation in South Africa, a number of innovative schemes have been devised to integrate black farmers into the commercial farm sector. These innovations include a range of agricultural participation models, such as farm worker equity schemes, build-operate-transfer schemes, lease and buy schemes, share production schemes, agricultural village

schemes and contract farming. Partnership approaches, involving the emergent farmer and the agribusiness-commercial sector, have appeared to be less costly in terms of cost per beneficiary than state led farmer settlement models (Van den Brink, 1996; Ngqangweni & Van Rooyen 1998; Van Rooyen, 1999). In particular, a wide range of small-scale farmer contracting arrangements operate in South Africa. These examples include contracting in the tea, fruit, sugar, flower, cotton, vegetable, timber, tobacco, mariculture and beverage sectors. A range of issues have been linked to the emergence of contracting in South Africa. The effects of colonialism and apartheid on black-white relations remain a vital consideration with respect to the establishment of contract farming, where small-scale farmers, mostly, see this arrangement as a means to participate in high value crop production, as well as to secure access to inputs like credit and fertiliser. Other issues that have emerged in South African small-scale contracting partnerships are the unequal power relationship between agribusiness and the farmers, the high level of transaction cost, the potential problems over company control of water, the leading role in production played by women and the low level of food self sufficiency in the farmer household because of family labour concentrating on contract production. Finally, the existence of managed small-holder contracting schemes has been associated with top-down management structures, political economy objectives and agribusiness paternalism (Levin, 1988; Porter & Howard, 1997a; 1997b; Van Rooyen, 1999; Karaan, 1999; Tregurtha & Vink, 1999; Kirsten & Sartorius, 2002; Sartorius and Kirsten, 2002).

1.2 The Problem Statement

The industrialisation of agriculture in many developed countries has resulted in the polarisation of the industry, as a result of the need for continuity of supply and economies of scale. It has been suggested that this feature is likely to be replicated in other parts of the developing world. There is, thus, a danger that a majority of farmers in developing countries could be excluded from the profitable niche markets and continue to produce only homogenous commodities with low returns, that are prone to the price volatility of world commodity markets. In this respect, Boehlje and Doering (2000) argue that smaller operations, not associated with an industrialised system, will have increasing difficulty in gaining the economies of size and the access to technology that is required in order to be competitive. Moreover, the trade

liberalisation efforts, as well as the harmonisation of standards, might also make it more difficult for small-scale producers to participate in new marketing opportunities presented under the reforms (Stanton, 2000). Although the process of industrialisation has created opportunities for smallholders in developing countries to produce a wider range of horticultural commodities under contract (Kandiwa, 1999), there is still the danger that the process of agro-industrialisation, globalisation and market integration will exclude these farmers from high value markets (Reardon and Barrett, 2000). Currently, only the well-endowed and skilled have the ability to be incorporated in modern organisation structures, illustrating how quality requirements, and the regulations of developed countries, have acted as effective barriers to participation by small farmers in developing countries. The potential polarisation of developing country agriculture is emphasised by the fact that fresh food products often account for half the total value of food and agricultural exports (Unneveher, 2000). Finally, there is general consensus that development in rural Africa will have to overcome many historic, socio-economic and physical constraints that include a legacy of missing markets. The constraints confronting farmers have often been exacerbated by government policy and poor infrastructure that have contributed to raising the barriers of entry to many high value crop sectors (Delgado, 1999). Merely implementing changes in policy will not remove these barriers to entry, that include a lack of education, a lack of access to information, missing markets and disproportionate patterns of asset ownership and infrastructure development (Currie & Ray, 1986; Delgado, 1999).

The setting of the problem in South African agriculture is rooted in a long history of the systematic oppression of black farming, combined with the active support of the White commercial farm sector (Bundy, 1979; Kirsten & van Zyl, 1996; Mbongwa et al, 1996; Schirmer, 2000). Currently, there is still a dual structure in the agricultural sector that displays a highly skewed distribution of assets and income, combined with high levels of inefficiency promoted by decades of government legislation (Fenyes et al, 1988; Van Zyl et al, 1996). In addition, agrarian transformation has been slow and less than 2% of white commercial farmland has been transferred to the Black farming sector since 1994 (Van Zyl & Kirsten, 1999).

The assumption that the commercialisation of small-scale producers will be efficient, should not be automatically concluded (Von Braun & Kennedy, 1994) and it has been suggested that small-scale farmers in the modern farm sector in South Africa, like their counterparts in many other post colonial and Latin American countries, are increasingly being confronted with low levels of productivity (Fenyes et al, 1988; Binswanger & Deiniger, 1993; Mbongwa et al 1996). The problem, in terms of its South African context, is that despite the changes in legislation, agribusiness could be unwilling to involve small-scale farmer supply chains because of the higher cost of co-ordinating this category of farmer. In conjunction with a lack of public finance, the barriers of entry to many value added crop sectors are prohibitive for small-scale farmers. These barriers to entry include the cost of modern production and processing facilities, that include high levels of capitalisation, running costs and skills. In addition, historical legacies have resulted in the establishment of unequal power relationships, skewed development patterns and unequal access to markets, infrastructure and services. The removal of these barriers has been compromised by the limited ability of government to rectify the current status quo (Binswanger et al, 1993; Mbongwa et al,1996; Kirsten & van Zyl,1996; Delgado, 1999; Kirsten & Sartorius, 2002). As a result of these problems, allied to the polarisation of the modern farm sector, the black farmer in South Africa is confronted with the prospect of exclusion from agribusiness supply chains. This process of marginalisation is emphasised by the low level of agribusiness investment in small-scale supply operations (Machethe et al, 1997; Van Rooyen, 1999; Van Rooyen et al, 1999). The question remains as to how agribusiness can make the process of dealing with smallholders cost effective and sustainable whilst, at the same time, contributing to poverty alleviation and development.

1.3 The Research Questions

The central research problem of this study is, whether or not small-scale farmers can be linked to agribusiness in developing countries. Five sub-questions are generated as a result of the principal problem. The first research question is, whether or not the organisation structure of the grower-processor supply chain is a function of its transaction characteristics. The second research question is, whether or not the transaction characteristics of the grower-processor supply chain are a function of the

prevailing institutional framework. The third research question is, whether or not small-scale growers generate a higher level of transaction cost than medium or large scale producers in the same grower-processor supply chain. The fourth research question is, whether or not contracted small-scale growers in an agribusiness supply arrangement can successfully compete with medium, large and company growers in terms of the cost efficiencies of production. Finally, the fifth research question, is whether or not the institution of contracting reduces the transaction cost of contracted small-scale growers and allows them to overcome the barriers of entry to high value cash crop sectors.

1.4 The Hypotheses

- The first research question examines whether the transaction characteristics of grower-processor supply chains influence the governance structure that is required to co-ordinate the respective activities. The relationship between the transaction characteristics of the firm and organization structure can be hypothesised as follows:

$$OS = f(U, F, ASP)$$

Where OS = organisation structure, U = uncertainty, F = Frequency and ASP = asset specificity.

- The second research question tests whether the transaction characteristics of grower-processor supply chains are a function of social-historical variables influenced by the prevailing institutional framework. The relationship between the transaction characteristics of the firm and certain social-historical variables can be hypothesised as follows:

$$TC = f(BEH, CONC, EQU, REG, ME, NR)$$

Where BEH = Human Behaviour, CONC = The historic concentration of industry and infrastructure, EQU = The social-equity objectives of the founders

of industry, the Government, foreign investors and international development organisations. REG = the prevailing property rights regulation, the judiciary. ME = macro-economic factors influencing the economy. NR = the Natural Resources and Physical Environment influencing an economy.

- The third research question tests whether small-scale growers generate a higher level of integrator transaction cost in the grower-processor supply chain than medium to large scale suppliers. The relationship between small-scale grower and medium-large scale grower transaction cost can be hypothesised as follows:

$$TC/TON_{SF} > TC/TON_{LF}$$

Where TC/TON= Transaction Cost per ton of raw commodity supplied,
SF = Small-Scale Farmer, LF = medium to large scale grower.

- The fourth research question tests the ability of small-scale growers, in the sugar and timber industries, to compete favourably, in terms of cost efficiency, with medium and large scale growers in the supply operation.The inverse relationship between productivity and farm size suggests smaller farmers, in many instances, are more competitive than larger farmers (Binswanger et al, 1993: Van Zyl, 1996). The relationship can be hypothesised as follows:

$$GC/TON_{SF} < GC/TON_{LF}$$

Where GC/TON= Raw commodity production cost per ton, SF = Small-Scale Farmer, LF = medium to large scale grower.

- The fifth research question tests whether the institution of contracting allows small-scale farmers to overcome the barriers of entry to the value added crop sector, by reducing the transaction costs involved. This study hypothesises that without the institution of contracting, small-scale farmers would be unable to participate in the value added crop sector.

1.5 The Objectives

The purpose of this study is to design an agribusiness-small-scale farmer contracting model that can be employed in South Africa. This study attempts to demonstrate that contract farming can be used, on an economic efficiency criteria basis, to involve small-scale farmers in the industrial farm sector. The objectives of the study are to demonstrate that:

- The transaction characteristics of a grower-processor supply chain influence the governance structure that is employed to co-ordinate the players.

- The transaction characteristics of a grower-processor supply chain, in turn, are influenced by the prevailing institutional environment.

- Contracted small-scale growers generate a higher level of transaction cost to the agribusiness partner than contracted medium or large scale growers.

- Contracted small-scale grower cost per unit of the raw commodity is equal to or less than that of medium, large and company estate growers.

- The institution of an agribusiness small-scale contracting partnership reduces the transaction cost of the small-scale growers, as well as allowing them to overcome the barriers of entry to certain high value crop sectors.

1.6 The Significance and Rationale of the Study

This study will contribute to the design of agribusiness small-scale farmer linkages, by developing a model that combines the lessons of history with a unique transaction cost based methodology of analysing raw commodity supply chains. The importance of the study is emphasised by the sheer magnitude of marginalisation, poverty and a lack of research in Africa, combined with the need to introduce measures that contribute towards economic development (Little, 1994; Watts, 1994; Binswanger et al, 1993; Delgado 1999). The relative lack of empirical studies in Africa underlines

the importance of conducting further research (Little & Watts, 1994; Eicher & Staatz, 1998) in a continent where it is estimated that some 110 million subsistence farmers exist (Von Braun, 1994). The gravity of the problem is also highlighted by the high level of failure of small-scale farmer contracting projects in developing countries (Watts, 1994, Little; 1994; Glover,1994; Von Braun & Kennedy, 1994; Runsten & Key, 1996; Delgado, 1999). The need to investigate alternative sources of capital inputs, including the institution of contracting, is, moreover, underlined by an international trend of economic reform programs that have drastically reduced public expenditure in the agricultural sector (Key and Runsten, 1999). The slow pace of agrarian reform in South Africa since 1994 (Van Zyl & Kirsten, 1999) has highlighted the urgent need to develop small-scale farm access to commercial farming opportunities (Ministry for Agriculture and Land Affairs, 1998). Finally, the importance of restructuring the agricultural sector in South Africa, in conjunction with land reform, are seen as key measures that need to be addressed in order to modernise the farm sector, as well as achieve greater levels of social equity (van Zyl, 1996; Kirsten & van Zyl, 1996).

Research in one hundred and seventeen other countries supports the consensus that small to medium sized family farms are often more productive than large scale mechanised farms (Van Zyl, 1996). The validity of promoting small and medium size farm production is further supported by a general history of small farm response to profit incentives (Schultz, 1998; Hayami, 1998) and a long history of sustained entrepreneurial ability in the often marginalised small-scale farm sector in South Africa (Bundy, 1979; Schirmer, 2000). The use of contracting has been widely cited as a way to achieve transformation and modernise traditional farming systems (Eicher & Staatz, 1998) and South Africa, in particular, has the potential for the development of small-scale farmer contracting given the well developed structure of agribusiness, combined with the growth of the food processing industry. This growth potential of processing is emphasised by the fact that only 15% to 27% of all fruit and vegetable production is being processed by some seventy nine processors (National Department of Agriculture, 2000).

1.7 The Methodology

A case study approach is employed to test the research questions because of the qualitative nature of the data, in addition to the ability to explore a wider range of variables that affect the structure and performance of agricultural contract grower-processor operations. The research questions are independently tested in two different case studies. The first case study includes two examples of small-scale grower-processor supply chains in the Southern African sugar industry and the second an example of micro-contracting in the timber industry.

A number of reasons have prompted the choice of a combined case study in the Swaziland and South African sugar industries. Firstly, the sugar industry in Southern Africa is widespread and has the potential to link with large numbers of small-scale growers. The incidence of small-scale farmer contracting with agribusiness in the sugar industry, has increased markedly in recent years in both South Africa and Swaziland and, in 2000, over 50 000 small-scale sugar growers were registered in South Africa. Secondly, the two case studies were chosen because small-scale growers compete with medium-large scale growers in both sets of grower-processor supply chains. A third reason for the choice was the complex logistics required to co-ordinate the harvesting and delivery of large volumes of a perishable raw commodity in order to make constant use of high fixed cost processing facilities. Finally, the case studies were chosen because of the opportunity to demonstrate that the structure and performance of the sugar industry have been influenced by a complex set of social-historical and physical variables.

The case study on the timber industry was selected because of the widespread nature of contracted small-scale farmers as suppliers. The industry has, in this regard, promoted the development of some 18 876 small-scale growers, occupying in excess of 43 000 hectares in Zululand, the Natal Midlands, Southern Natal and the Eastern Cape. The timber industry has developed strategic plans to significantly expand small-scale growers. The case study was also selected because small-scale growers compete with both company plantations and medium-large farmers. The timber case study, like its counterpart in the sugar industry, involves complex co-ordination and logistics requirements. Finally, the timber industry case study was also selected because the

structure and performance of this industry have been particularly influenced by the prevailing institutional environment.

A theory of the firm approach, illustrated in Chapter Three, has been used as the basis to construct a conceptual framework, developed in Chapter Four, in order to test the research questions in a case study application. More specifically, Chapter Four develops a unique approach to operationalise the transaction cost theory developed in chapter Three.

1.7.1 Research Question One

The case studies employ the historical records of the selected companies, as well as personal interviews, to identify the actual transaction characteristics of the respective grower-processor supply chains. The historical records of the selected case studies are analyzed to determine the frequency of these transactions, the degree to which the processing assets of the integrator are specific to the transaction and the level of supply uncertainty that exists. The frequency of the supply transactions is determined by counting the total number of raw commodity deliveries. The asset specificity of the supply transaction is determined on the basis of the current net book value of the processing plant and the degree of co-ordination required to synchronize the processing of the raw commodity. Finally, the degree of supply uncertainty is evaluated on the basis of a qualitative analysis of the medium-long term factors that could influence the continuity of supply. In each case, the transaction characteristics of frequency, asset specificity and uncertainty are graded as low, medium or high on the basis of the methodology developed in Chapter Three.

In order to test if the actual transaction characteristics have influenced the actual governance structure of the supply operations, the following steps are taken. Firstly, the actual transaction characteristics of frequency, asset specificity and uncertainty are identified in the historical records of the case studies before being classified and graded. Next the actual contract conditions, located in the historical records of the company are classified and graded. The conceptual linking of transaction-contract characteristics to a continuum of governance structures has been guided by transaction cost theory, developed in Chapter Three, and the development of a conceptual

framework in Chapter Four. On this basis, the actual transaction-contract characteristics of the raw commodity supply operations are matched with the most suitable governance structure within the confines of a conceptual framework. The actual governance form of the case study application, identified in the historical records and plotted in the conceptual framework, is then compared with the theoretically optimum governance form. On the basis of a suitable match between the actual and theoretically optimum governance forms, a qualitative argument is developed to test whether the actual transaction characteristics of the raw commodity supply operation have influenced the actual governance form as represented by a specific form of contracting. A crucial question, in this regard, is whether the processor could co-ordinate the supply of the raw commodity on an open market basis.

1.7.2 Research Question Two

The case studies examine the historical records of their respective industries in order to identify significant variables that have influenced industry level transaction costs. The relationship between firm level transaction cost and these social-historical variables, is based on the assumption that history has a long term pervasive influence on the property rights economics and institutional framework of an economy (Williamson, 2000).The selection of data and methodology employed to demonstrate the relationship between variables in the prevailing institutional framework and transaction cost, is based on a schema of theories approach developed by Williamson (2000) in Chapter Three and operationalised by the proposed conceptual framework in Chapter Four. This approach demonstrates how historical legacies influence the prevailing institutional framework which, in turn, influences the transaction cost of the individual firm. The case studies therefore evaluate how historical legacies have influenced human behaviour, the concentration of industry, the property rights economics and the balance of equity-economic objectives in the prevailing institutional framework. The related transaction cost is then traced to the historical records of the case studies to better explain the economics of transaction cost.

1.7.3 Research Question Three

The study analyses the historical records of the selected case studies with respect to three elements of transaction cost that are generated as a result of the raw commodity supply-delivery operations. The transaction cost elements include start up cost, harvesting-delivery costs and the administration of growers' affairs. The development of transaction costs, largely quantified in terms of transaction frequency, have also been guided by the conceptual framework developed in Chapter Four. The transaction costs of small-scale growers are separately assembled and compared with larger growers before a qualitative argument is developed to test whether or not small-scale grower transaction cost is greater than that of larger suppliers.

1.7.4 Research Question Four

The historical grower production cost records of the selected case studies have been accessed to calculate the average total production cost per ton of the raw commodity. The cost data, maintained by the accounting divisions of the respective companies, have been assembled for each cost element of production. Separate cost records for both the company estates-plantations have been developed and compared to those of contracted small-medium suppliers. The cost data, representing a three to five year period, have been restated in terms of 1999 prices and averaged. in order to compare the long term performance of the growers. The cost data are supported by some comparative results of similar studies of small-scale grower performance in the same crop sector. Finally a qualitative argument is developed to test whether small-scale farmers can compete on a sustainable basis with larger growers in terms of cost efficiency

1.7.5 Research Question Five

The fifth research question tests whether the institution of contracting acts as a mechanism to allow small-scale farmers to overcome the barriers of entry into a high value cash crop sector. The historical data of the case studies are used to test this research question. The methodology tests this research question on the basis of a qualitative description of the historical position of the grower, versus their current .

situation as a contracted grower. This section also describes the extent to which the agribusiness partner has assisted the contracted small-scale grower to obtain missing inputs and whether these actions have contributed to the small-scale farmer overcoming the barriers of entry to the sugar and timber industries.

1.8 The Data

The data for each case study are separately discussed in each of Chapters Five and Six. In general, however, the data relating to each case study include historical information relating to the industry concerned, the agribusiness partner and the grower. The data have been obtained from the historical records of the agribusiness companies, the respective industries and the grower associations respectively. Historical data have also been obtained by way of interviewing various company officials. Further historical data, including cost surveys have been obtained from the South African Sugar Growers Association, the South African Timber Growers Association and Forestry Economic Services (Pty) Limited. Although the data are largely of a qualitative nature, certain quantitative data have been assembled to assess the extent of trust in one of the case studies.

1.9 The Delimitation's

The nature of the contracting relationship is restricted to any arrangement whereby a farmer is formally or informally contracted to supply an agribusiness processor with a raw commodity.

This study has assumed the processor-marketer in the contractual relationship is an agribusiness partner that operates as a profit seeking entity in the private sector. Farmer supply arrangements to other types of organisations have not been included in the study.

1.10 The Outline of the Study

The outline of the research design is as follows: Chapter Two develops a historical survey of contract farming literature in order to debate the research problem in an

international context and to establish an economic rationale for contracting. Further objectives of this chapter include the identification of key success factors and the establishment of a set of lessons that can be incorporated in the resolution of the research problems and the design of agribusiness-smallholder contracting models. Chapter Three employs a conceptual historical survey to illustrate how transaction cost theory can be employed to explain the economics of both organization structure and their related transaction characteristics. Chapter Four develops a conceptual framework that expands on the operationalisation techniques of transaction cost theory. The conceptual framework will provide a methodology to test the research questions in the case studies. Chapter Five develops a case study in the Swaziland and South African sugar industries in order to test the research questions. Chapter Six employs a case study in the South African timber industry to further evaluate the research questions. Chapter Seven constructs a proposed model for agribusiness-small-holder contracting partnerships in South Africa. This chapter combines the lessons of history and the economic rationale for contracting, developed in Chapter Two, the economics of organization structure, developed in Chapters Three and Four, and the results of the case studies in Chapters Five and Six, in order to propose the design of a suitable smallholder contracting model. Finally, Chapter Eight will develop a summary and conclusion to this study and comment on the future direction of vertical coordination in developing countries, as well as suggest avenues for future research.

2.1 Introduction

This chapter evaluates the research problem against the backdrop of the international experience of contract farming in both developed, as well as, developing countries. The objective of this chapter is to gain a better understanding of the institution of contracting, as it applies to smallholder agribusiness partnerships in developing countries. More specifically, the purpose of this chapter is to develop an economic rationale to explain the increase of contracting in the agricultural sector, as well as to establish a number of lessons that can be identified in the case studies and incorporated in the design of smallholder contracting schemes with agribusiness. The chapter commences with some definitions of contracting and its related terminology, before examining the history and spread of contracting. The increased incidence of contracting is explained by the industrialization of agriculture and contracting in both developed and developing countries, as well as a result of missing or imperfect markets. The chapter explains the reasons for the forces of change and the advantages and disadvantages, from both the agribusiness and grower perspective, for the increased use of contracting as a means to co-ordinate modern agricultural supply chains. The chapter then outlines a series of lessons that can be used as a basis to design smallholder contracting arrangements with agribusiness before developing a summary and conclusion.

2.2 Vertical Co-ordination: Some Definitions

There are many different ways of organizing economic activity and economic transactions can take place within markets or firms. The firm's activities can be coordinated by the markets, by contracts, by alliances, by joint ventures or by full vertical integration (Brickley et al, 2001). The firm can, therefore, coordinate economic activity by adopting a number of different governance forms along a vertical coordination continuum of opportunities. This continuum ranges from spot market acquisition, on the one side, to full vertical financial ownership on the other, with a number of hybrid organization forms in between these two extremes (Mahoney, 1992; Peterson & Wysocki, 1997; Peterson & Wysocki, 1998; Pasour,

1998; Rudolph, 1999). On the one extreme, economic activity is coordinated by the market and, on the other, it is managed within the company hierarchy (Peterson & Wysocki, 1997) where the boundaries of the firm underline those activities that are internalized in the firm's organization structure and those that are external to it (Coase, 1990).

The organization of economic activity is often managed by way of forming specific relationships with other firms. Vertical coordination occurs when a firm combines its own activities with another firm that performs different, but related activities, in transforming inputs to outputs. These related activities may occur before or after the activities that are managed within the boundaries of the firm (Rehber, 1998) and the two independent operating units work closely together to manage the flow of goods and services along the value chain (Johnstone & Lawrence, 1988). In this respect, the act of ownership, or a long term contractual arrangement, would tend to internalize the exchange process that occurs between the parties in a value chain (Kilmer, 1986). Vertical coordination can also be described as the cross functional alignment of value added activities that drive the physical movement of raw materials and finished goods from the point of purchase to the point of consumption. In this context, vertical coordination can be evaluated purely from a logistics point of view where the assumption is that logistical factors cause transaction costs with respect to activities like distribution, site and customer locations, communications, the corporate structure, routing, scheduling and planning (Rodriquez, 1996). Finally, the degree of managed coordination in the supply chain can be ascertained by determining the extent of the transfer of decisions and assets between the participants. When all the decisions are dominated by a single party, then ownership integration or a merger exists and, conversely, when each firm retains its own separate identity, but leaves certain decisions to the other firm, then contract integration or vertical coordination occurs (Rehber, 1998).

For the purposes of this study contract farming is defined as a form of vertical coordination between an agribusiness processor-marketer and a farmer who is contracted to supply some type of raw commodity. More specifically, the definition of specification contracting, that has been assumed by this study, includes forms of vertical coordination, between growers and buyers-processors, that directly shape the

production decisions of growers through contractually specifying market obligations. This definition further assumes that agribusiness inputs are often made available to the grower partners and that the agribusiness partner has some measure of control at the point of production (Little and Watts, 1994). The agribusiness partner could be a processor, a packer or a marketer (Goodhue, 1999).

The increased levels of vertical coordination in the modern agricultural sector, are reflected in many other industry sectors around the world. Vertical coordination, involving a hybrid of governance forms, is rapidly increasing in the banking industry, the defense industry, the telecommunication industry and the automobile industry (McAfee, 1999). Other industries include the textile and construction industries, trading and automotive companies, book publishing and the motion picture industry where increased levels of managed control are often conducted in a loose form of vertical coordination (Johnstone & Lawrence, 1988). In Japan, 'Keiretsus' include vertical coordination partnerships in the oil, automotive, newspaper, processed food, camera, pharmaceutical and cosmetic industries (Cutts, 1992) where the Just-In-Time management system of supply requires higher levels of coordination between the supplier and the manufacturer (Drury, 1996; Atkinson et al, 1999; Horngren et al 1999).

2.3 Contract Types in Agriculture

Vertical coordination contracts in agriculture embrace a wide number of arrangements that bind the grower and an agribusiness partner. The various types of contracts could include a marketing contract, a contract specifying some measure of company control or a contract specifying the provision of company inputs and full company control of production (Wolz et al, 1999). In the case of a marketing contract, sometimes called a market specification contract, the producer sells the raw commodity to the processor at a specified price, quality and time. In this type of contract, the producer has full autonomy regarding production decisions (Rehber, 1998). In the second type of contract, certain company inputs and services could be supplied by the agribusiness partner and there is some measure of company control in order to achieve higher levels of managed coordination of the supply and delivery of the intermediate product. In this type of arrangement the farmer agrees to produce

the raw commodity under some degree of company control and specification, and also to sell the commodity to the processor at an agreed price, quality and time (Rehber, 1998; Wolz et al, 1999). The third type of contract includes full company control, in addition to the provision of company inputs, and, thus complete control of the production process passes to the agribusiness partner, who will supervise production and provide the necessary inputs and services, as well as remunerate the producer at an agreed price for the raw commodity (Rehber, 1998; Wolz et al, 1999). The contract should always specify the price, quantity, quality, the provision of inputs, credit facilities, the conditions of production and the delivery and grading requirements (Sporleder, 1992; Runsten & Key, 1996; Wolz et al, 1999). The price set in these various arrangements could be a fixed price or a differential price (Sporleder, 1992). Finally, in certain cases of contracting, the structure of the contract could be based on the farmer's access to key resources like water (Morvaridi, 1995) whilst, in others, the producer does not even own the intermediate product which remains the property of the agribusiness partner. In a contract like this, the integrator uses the facilities and labour of the farmer, who is paid a fee to provide facilities and services, whilst simultaneously ensuring that agribusiness developed technology is retained exclusively by the firm (Martin,1999;Goodhue, 1999).

The structure of the contract is sometimes shaped by the nature of the integrator, as well as the number of contracted growers. Some forms of contracting are, for instance, dependant on specific institutions like bargaining or marketing cooperatives (Sporleder, 1992). Conversely, when large numbers of small-scale growers are involved in a vertical coordination arrangement, it is often more efficient for both parties if the small-scale growers are represented by a farmer association. Contracting arrangements, especially in developing countries, sometimes involve large numbers of small-scale farmers (Little & Watts, 1994) and the agribusiness cost of contracting on an individual basis would be prohibitive. Agribusiness will, primarily, interact with the farmers' association to ensure that all the necessary inputs and requirements are communicated to the contracted growers. The farmers' association, therefore, acts as a body that provides training, ensures growing practices are maintained, ensures the provision of inputs and extension services and who coordinates the harvesting, delivery and supply of the intermediate product (Runsten & Key, 1996; Rehber, 1998; Wolz et al. 1999). The farmer cooperative, in this regard, is better able to establish a

greater degree of representation for its members and negotiate the terms and conditions of the contractual relationship (Wolz et al, 1999).

2.4 A History of Contract farming

The current increase in levels of vertical coordination can be viewed against the backdrop of a number of distinctive paradigms of organization structure in agriculture. The first period spans the era in which primitive agriculture was a fully integrated system. The farm family made all the production-processing decisions and provided all the inputs and consumed all the outputs. The second era can be traced to the development of market orientated agriculture in which different parties specialized in different functions in the supply chain as a result of urbanisation. Finally, the third era has witnessed the reintegration of many previously specialized functions in response to emerging market forces (Pasour, 1998;Rehber, 1998). The origins of the contracting farming can be traced back to the second era and isolated cases of this institution reach far back into history.

Contract farming was employed, as early as 1885, by the Japanese to secure sugar production in Taiwan (Rehber, 1998) and by United States multinationals in Central America, at the beginning of the 20th century, as a result of state pressure and domestic labour militancy (Clapp, 1994). The widespread use of contract farming appears to have gathered momentum in the 1930s. In a majority of instances the impetus for contracting in this period appears to have been the need of agribusiness for land, cheap labour and geographical conditions suited to certain crops. Two early examples in agriculture include the fruit-vegetable canning sector and seed production. In the period 1930-1950, contracting in the fruit and vegetable canning sectors expanded in developed countries like the United States and Europe (Little & Watts, 1994). In the same period, seed production contracts were employed in Europe and North America where seed merchants contracted with growers in Britain, France, Holland, Australia, Canada and Hungary and the United States. The seed production industry, thereafter, moved from the United States and Europe to Japan in the 1950s, to Taiwan in the 1970s and to Thailand, Mexico, Costa Rica, and the Philippines in the 1980s (Watts, 1994). The supply of fruit and vegetables to United States markets has been increasingly grown on a contract basis since the

Second World War. Mexican growers, for instance, have supplied United States markets since the 1950s and the growth of contracting in this region is illustrated by the value of contracted Mexican exports which amounted to some US $ 790 million in 1989 (Watts, 1994). The growth of contracting has accelerated markedly in the period 1980 to 2000 and by the late 20th century, the use of contract farming, in many food and fibre sectors, was widespread across Western Europe, the United States and Japan (Rehber, 1998).

The extent of vertical co-ordination in the United States agricultural sector is a good example of the widespread increase of contract farming in the developed world. In recent times, more than one in ten farmers have derived some form of income from contracting with processors or packers (Rhodes, 1993; Colchao, 1999). By 1993-1994 some 40% of total farm output was produced under contract, including the production of broilers, milk, hatching eggs, turkeys, hogs and fed cattle. In the United States during the last decade there have also been increases in the production of food and feed grain crops, cotton, tobacco and specialty crops (Pasour, 1998) and, in the period 1960-1980, there was a significant increase in contracting for vegetables, fruit, nuts and seed crops (Kilmer, 1986). The restructuring of the poultry egg sector has followed similar trends where investor firms have been the primary force behind the increasing levels of integration in order to improve financial performance (Ling & Leibrand, 1995). The history of contract farming in the hog sector particularly illustrates the shift from agricultural production to industrialized agriculture in the United States (Watts, 1994). By the late 1980`s, twelve percent of all pigs were grown under contract and open land production is, increasingly, being replaced with a closed lot, factory type system, utilizing specialized buildings and increased levels of horizontal and vertical coordination (Rhodes, 1993).

Agricultural production under contract has also increased steadily in developing countries during the 20th century. This institution has spread rapidly in Asia, Latin America and Africa as a result of the improved returns earned by high value export crops, in conjunction with the impact of new technologies (Clapp, 1994; Eicher & Staatz, 1998). Contract farming in Latin America has been extensively promoted since 1945 in a series of import substitution programs (Clapp, 1994; Little & Watts, 1994; Daddieh, 1994; Runsten & Key, 1996). Agribusiness has, mostly, been

widely involved and included multinational corporations, the indigenous rich and state bureaucracies that have operated under several decades of reformism in countries like Chile, Brazil and Mexico (Korovkin, 1992). Although Latin America has a much longer history of this institution than Africa, contract farming, often known as satellite farming, expanded significantly in colonial Africa in the fruit and vegetable canning sectors as early as the period 1930-1950 (Little & Watts, 1994).

Contract farming schemes in developing countries tend to have been one of two types. In the first instance, large numbers of growers, occupying sizeable tracts of land, were contracted to produce traditional commodities . These schemes have normally involved a high level of central control by an agribusiness-government partner who provided numerous services to the growers. The presence of international donors and government partners has also been a common feature in many of these types of contracting projects. The state has often undertaken an active role in the promotion of contracting arrangements in developing countries, especially Africa, where the government or a parastatal has often been included as one of the principal partners in the arrangement (Watts, 1994; Little, 1994). The second type of contract scheme has involved the production of non traditional crops by a smaller number of more entrepreneurial growers. This type of scheme has been more closely associated with an agribusiness type partner that has exercised a much lower level of control. Of the two types of contract arrangements, there is evidence that the growth of contracting, involving non traditional crops, has been greater than that of traditional crops (Glover, 1994).

Although these two types of contracting arrangements predominate in developing countries, an additional arrangement sometimes involves local farmers and processors at the village level (Kawagoe, 1994). Finally, contracting in developing countries has often been associated with a multiplicity of parties, and objectives, incorporated in the contract. These parties could include the grower, agribusiness, local authorities, the government, donor bodies, research institutions and non government bodies (Glover, 1984; Little, 1994 ; Watts, 1994; Runsten & Key, 1996; Delgado, 1999)

In Africa the use of contract farming increased markedly in the period 1975-1985 with some sixty schemes operating in sixteen different countries (Carney, 1988; Watts, 1994; Little, 1994; Eicher & Staatz, 1998). Contracting, involving small farmers, has been most extensively developed in Kenya where, some 350 000 contract farmers were registered by 1991. This country, since the 1960's, has, increasingly, produced a range of industrial and export crops (Glover, 1994;Jaffee, 1994; Jackson & Cheater, 1994). Other counties with a history of contract farming, include Zimbabwe, Gambia, Cote d'Ivoire and Ghana. In Zimbabwe (until 2001), growers have contracted since the mid-1950s with varying levels of success under a wide range of institutions to produce cotton, tea, sugarcane, tobacco and vegetables (Jackson & Cheater, 1994). In Gambia contracting has been employed by the government since 1984, for an ambitious irrigated rice project (Carney, 1994) and in Cote d'Ivoire and Ghana, contracting has been extensively used to produce palm oil (Daddieh, 1994). The Tanzanian Villagarisation project has been widely cited as an unsuccessful attempt to promote agricultural development using contract farming (Currie & Ray, 1986).

In conclusion, contract farming in Africa has generally resulted in improved farmer income that is counterbalanced by the loss of traditional lifestyle. In this regard, the World Bank has assessed that the advantages of contract farming to the small-scale farmer include the benefits of modern technology, better access to agribusiness inputs and skills, access to processing, storage and marketing facilities, and, that these advantages outweigh the disadvantages that are largely of a social nature (Levin, 1988; Porter & Howard, 1997a; 1997b).

2.4.1 Contract Farming in South Africa

Documented examples of contract farming in South Africa are found in the tea, fruit, sugar, flower, cotton, vegetable, timber, tobacco, mariculture and beverage industries (Levin, 1988; Porter & Howard, 1997a; 1997b; Van Rooyen, 1999; Karaan, 1999; Tregurtha & Vink, 1999; Weatherspoon et al, 1999; Sartorius & Kirsten, 2002). Other examples of contract farming exist in the growing of sunflower seeds (Epic Oil), mushrooms (Denny Mushrooms), fresh vegetables (Woolworths, Irvin & Johnson, Gants & Robertsons) milk (Nestle), and the production of olives, tomatoes,

subtropical fruit, grapes and citrus (New Farmers Development Company). In all of these cases farmers are producing a particular commodity of a specific pre-determined quality, and quantity for a specific firm.

2.5 The Rationale for Contract Farming in Agriculture

2.5.1 The Forces of Industrialisation in Developed Countries

The industrialization of agriculture has been influenced by an international trend of market-orientated reforms that have contributed to the increased integration of world markets (Reardon & Barrett, 2000). This process has resulted in fewer larger farms, the concentration of farming, increased specialization and closer ties with processors (Schrader, 1986;Frank & Henderson, 1992; Rhodes, 1993; Ling & Liebrand, 1995; Schrader & Boehlje, 1996; Pasour, 1998; Pritchett & Liu, 1998) and the farming industry is being increasingly characterized by larger, industrialized firms that are more tightly aligned across the supply chain (Boehlje, 2000) Increased levels of vertical coordination are, thus, set to change the structure of production away from smaller independent operating units, functioning in a decentralized open market system, where there is limited product differentiation, to larger units that are increasingly linked by contract to an integrated supply chain involving a high level of product differentiation (Barry et al, 1992; Babb, 1992; Sporleder, 1992; Schrader & Boehlje, 1996; Pasour, 1998; Peterson & Wysocki, 1998; Pritchett & Liu, 1998).

The concept of agricultural industrialisation describes the significant structural changes in the food and fibre systems and this process is assumed to have occurred as a result of the changing patterns of ownership and the organisation of processes (Leathers, 1999). Industrialisation is the consequence of economic growth, mechanisation and the increasing scale of organisation where this concept is seen as the difference between past and present production, processing, marketing and distribution systems (Sofranko et al, 2000). The industrialisation of agriculture is an evolutionary efficiency response to the need to minimise transaction cost and for tighter levels of co-ordination and control in agricultural supply chains in order to secure competitive advantage (Coase, 1937; Babb, 1982; Sporleder, 1992;

Williamson, 1995; Rowlinson, 1997). The process of industrialisation also refers to the increasing consolidation of farms and the vertical co-ordination among the stages of the food and fibre system (Council on Food, Agriculture and Resource Economics, 1994) and implies that larger scale production units are being increasingly linked to the supply chain through formal or informal arrangements (Boehlje and Doering, 2000). Although the term industrialisation is a nomenclature for a whole range of changes, two stand out. According to Drabenstott (1995) these changes are a shift from food commodities to food products and a move from spot markets to more direct market channels, such as production contracts. Boehlje (2000) articulates the changes in a slightly different fashion, by arguing that the most dramatic changes in agriculture are occurring in terms of the following: Firstly, the industrialization of agriculture is associated with the development of differentiated products. Secondly, this process is associated with the implementation of biological manufacturing and thirdly with the formation of food supply chains. Food production has, thus become an industrialised and capital intensive business that operates in a highly competitive and unpredictable global market. The problematic nature of the agricultural sector is underlined by the reduced ability of this sector to employ labour whilst, at the same time, world markets are confronted with increasing levels of supply of products, for which the demand is relatively inelastic. The inelastic demand for agricultural products, combined with increasing levels of production, has therefore resulted in problematic surpluses for many countries who often export high value agricultural products whilst simultaneously importing staple foodstuffs (Meliczek, 2000).

Developments in biotechnology and information technology have been closely linked with an increase in contracting in developed countries (Schrader, 1986; Pasour, 1998), where research and development in agriculture is being increasingly privatised in order to develop new products that can be branded and technology that can be patented. Research, technology development and transfer are increasingly being undertaken by the private sector (Huffman & Just, 1994; Jiggins, 1997; Sofranko et al, 2000). Furthermore, higher levels of vertical co-ordination have been promoted by a general climate of government withdrawal from agriculture, which has resulted in reduced intervention and a reduction in the funding of activities and institutions that fall into the agricultural sector (Pasour, 1998; Rehber, 1998). The increased levels of vertical co-ordination are, thus, a response to

technology development where the primary beneficiaries of new technology, like genetic engineering, will accrue to the holders of patents (Pasour, 1998; Flaskerud & Klenow, 1999). The need for tighter co-ordination is, therefore, being influenced by the need to develop and patent biological and information technologies in agricultural supply chains. A vertically co-ordinated structure can encourage the collaboration of suppliers in the research and development phase, as well as ensure that the developed technologies are only used by the contracted partners (Schrader, 1986; Pasour, 1998). Finally, higher levels of vertical co-ordination, apart from the development of cost reducing technology, have been associated with lower prices where the chief beneficiaries are the consumers (McAfee, 1999).

The need for higher levels of co-ordination is influenced by the need to co-ordinate production, that is often spatially dispersed, with processing and marketing activities in order to meet stringent consumer demands (Schrader, 1986; Royer, 1995). The degree of co-ordination between the contracting parties is, therefore, often a function of both the numbers , and spatial distribution, of farmers (Runsten & Key, 1996). Modern agricultural supply chains incorporate complex processing facilities that require a highly co-ordinated approach in order to optimise the firm input-output function. Vertically co-ordinated structures result from the need to synchronise the firm's activities, optimise efficiency and minimise cost (Sporleder, 1992; King, 1992; Featherstone & Sherrick, 1992; Glover, 1994;Pasour, 1998; Rehber, 1998). The high levels of fixed cost in the food processing industry further influence the requirement for tighter co-ordination because of the need to make constant use of capacity in order to minimise fixed cost per unit of output. Because of the high level of co-ordination required in many modern agricultural supply chains, it is increasingly unlikely that the spot market can ensure the synchronisation of a continuous supply of a uniform quality raw commodity (Glover, 1984; Kilmer, 1986; Glover, 1994; Mahoney, 1992; Hennessy, 1996; Azzam, 1996).

Higher levels of co-ordination are influenced by consumer demands for differentiated products that are coupled with stringent requirements with respect to the health, nutrition and convenience characteristics of the product (Royer, 1995). The increasing fragmentation of demand has influenced product differentiation that, in turn, requires higher levels of managed co-ordination (Hayami, 1998). Better educated

consumers (Rehber, 1998) are increasingly forcing the pace and direction of product differentiation and quality specifications (Sporleder, 1992; Hennessy, 1996; Pasour, 1998). The increased fragmentation of demand, allied to stringent consumer requirements and the increased levels of processing, have expanded the range and differentiation of food products (Von Braun & Kennedy, 1994; Royer, 1995) where traditional open market mechanisms are not able to communicate the appropriate consumer requirements to producers (Belden, 1992). The need for increased levels of vertical co-ordination, thus, results from the need to develop differentiated products in a structure that links production with consumer requirements. This type of structure also ensures input control in a co-ordinated supply chain that is configured to agribusiness specifications (Belden, 1992; Rhodes, 1993; Rehber, 1998; Pasour, 1998; Goodhue, 1999; Sofranko et al, 2000).

2.5.2 The Forces of Industrialization and the Growth of Contracting in Agriculture: Developing countries

The industrialisation of agriculture in developing countries, is often seen as a function of many diverse social and economic forces that are country specific (Ruttan & Hayami, 1990; Ruttan, 1990; Timmer, 1990). The forces influencing the structure of agriculture are a function of history, culture, political influences, infrastructure development, the existence of institutions, the availability of technology, development strategy, trade policy and other socio-economic factors (Glover, 1987; Islam, 1994; Zhong et al, 1994; Ahmed, 1994 ; Rehber, 1998). Contract farming, in this regard, has been cited as a way to contribute towards development in Sub Saharan Africa (Eicher & Staatz, 1998; Coulter et al, 1999). In many cases, a notable feature of agricultural development projects in Africa is that the state has been the major initiator of schemes that incorporate local farmers under contract (Daddieh, 1994). The enthusiasm of donors about the benefits of contracting in developing countries, however, has resulted in inflated expectations of the potential of this institution (Little, 1994). Although contract farming appears to have increased farm family income in general there are many instances of this institution being used to exploit farmers (Porter & Phillips-Howard, 1997a).

The historical legacies of many developing countries have resulted in skewed access to land labour and capital (Binswanger et al, 1993) where some 440 million farmers in developing countries still practice subsistence agriculture (Von Braun, 1994) alongside large farming systems that are closer to corporate and government power structures (Hayami, 1990; Pasour, 1990). Historically, agribusiness has played an important role in the industrialisation of agriculture in developing countries for a number of reasons. Firstly, agribusiness acts as a primary and compelling force of change affecting the welfare of a large number of people within the vicinity of the operation. Secondly, agribusiness homogenises the process of commercialisation and industrialisation by applying internationally used practices and technologies. Finally, agribusiness takes the initial risk of investment and, generally, adopts a long term perspective as a participant in the agricultural sector of the country concerned (Karen, 1985; Williams, 1985). The industrialisation of agriculture can be achieved with large or small scale production sectors, or a combination of both, (Islam,1994) where backward linkages from agricultural processors to farmers act as an important force to influence higher levels of managed co-ordination (Von Braun & Kennedy, 1994). Processing agricultural products greatly expands the number of marketing opportunities available and the establishment of processing enterprises has been a central feature of the development plans of many developing countries, as well as international aid organisations, the Commonwealth Development Corporation and the World Bank (Little, 1994; Watts, 1994; Abbott, 1994).

The rapid growth of contracting in developing countries can be partially explained by the growing food dependence, the need to generate foreign exchange (Little & Watts, 1994) and as a means to industrialise and restructure agriculture (Goodman, Sorj & Wilkinson, 1987). Contracting is also seen as a vehicle to modernise traditional production systems (Vergopolous, 1985; Binswanger et al, 1993) and a means to counter missing or imperfect markets (Runsten & Key, 1996; Delgado, 1999). A lack of resources, as is typically the case in many developing countries, acts as a force to influence higher levels of co-ordination with the private sector in order to secure a range of inputs. The importance of investigating contracting, as a means to modernise the small farm sector in developing countries, is further illustrated by the many economic reform programs that have drastically reduced public expenditure in the agricultural sector (Key and Runsten, 1999; Porter

& Phillips-Howard, 1997a; Eicher & Staatz, 1998). Furthermore, the deregulation of markets, combined with consumer awareness and product differentiation, has resulted in tighter quality specifications on world markets that can only be achieved in developing countries by a more integrated relationship between growers and processors. The international links of agribusiness, with regard to quality specifications, are thus, configured with the production practices of contracted growers in order to ensure acceptable standards (Williams, 1985; Watts, 1994; Eicher & Staatz, 1998).

2.5.3 Market Failure and Vertical Co-ordination

The new institutional economic theory provides a useful theoretical framework to further explain the existence, and theoretical rationale, of contract farming as a result of the problems of market failure and missing markets that cause uncertainty (asymmetric information) and influence transaction costs. The characteristics of agricultural produce often influence market requirements. Agricultural produce typically varies in terms of moisture and sugar content, size, shape, colour, flavour and the timing of delivery. These qualities, combined with characteristics like perishability, quality and production variability, influence transaction characteristics and the suitability of marketing outlets. Consumers that have particular preferences for these characteristics are normally prepared to pay a premium for these products. Spot markets, and the traditional price mechanism, are unable to satisfy consumer needs because complex quality requirements are not communicated to the entire supply chain (Key and Runsten, 1999; Grosh, 1994 and Minot, 1986). These problems are exacerbated by the existence of missing markets for information or imperfect-asymmetric information (Grosh, 1994; Key and Runsten, 1999). When there is asymmetric information between the buyer and the seller regarding the quality of the product, traditional markets are unable to co-ordinate the players and higher levels of managed co-ordination are required. In this respect, specification contracting is often cited as an institution that can replace the open market system with an institution that can configure the needs of consumers with producers, as a result of higher levels of integrator control over the farmer. Market internalisation explains restructuring along the vertical co-ordination continuum including the conglomerate and the multinational corporation (Pitelis, 1996). Table 2.1 illustrates how production

technology information, complex quality requirements and desired product characteristics are often not conveyed in the open market system, and when markets for this type of information do not exist, producers need to adopt some form of vertical co-ordination in order to acquire it (Minot, 1986; Delgado, 1999).

Table 2.1: Market failure and mechanisms of vertical co-ordination

Type of market failure and co-ordination problems which result	Circumstances under which failure occurs	Method by which institutions improve co-ordination	
		Contracting	Vertical Integration
Production information asymmetry: Buyer knows significantly more than growers about the production technology	Crop has complex technology or is new to grower	Management-providing contract which specifies practices to achieve quality, timing, and at least-cost production. Cost of extension covered in marketing good.	Internalised transfer of production information through company communication system
1. Quality improvements could increase profitability for growers but growers lack technical know how	Quality varies, affects demand, is controllable.		
2. Better timing of supply could raise profitability but growers cannot change timing	Timing of supply affects demand, is controllable		
3. Improved practices would be profitable but growers are not familiar with them	Improved practices exist and are known by buyer		
Marketing information asymmetry: buyer knows significantly more about markets than growers, e.g. future, seasonal patterns, quality needs.	Crop has specialised or distant market, demand is relatively new.	Market-specification contract, which allows greater exchange of information regarding demand: quality timing and price.	Market information transferred within the integrated firm down to the field level
1. Quality improvements could increase profitability for growers but growers are not aware of premium on quality.	Complex quality requirements, especially exports		
2. Better timing of supply could raise profitability but growers are not aware of timing requirements.	Perishable good for processing or export.		
3. Although greater production is profitable, grower not sure of future price.	Volatile or new market, grower does not trust monopsonist.		
Imperfections in markets for credit, inputs and agricultural services. High transaction costs, growers unsure of profitability of inputs and services, lenders unsure of reliability of borrowers, policy-induced distortions which reduce input and credit availability.	Use of large amounts of inputs, particularly specialised inputs, is profitable for the commodity.	Resource-providing contract supplying inputs and credit. Repayment assured by contract to market product.	Credit and inputs provided internally within the firm.
1. Quality is sub-optimal due to limited use of inputs and services.	Crop for which quality depends on inputs.		
2. Timing of supply is inappropriate or uncoordinated without inputs and services.	Crop for which timing depends on inputs.		
3. Sub-optimal output and excessive use of inputs and services.	Crop for which input use reduces production costs.		

Source: Minot, 1986

Market failure, especially the unavailability of production credit, limits the adoption of new crops and restricts access to inputs, technology and information that are necessary to produce a timely and good quality product. This often results in many farmers not being able to produce a particular commodity unless the supply of credit and inputs is provided and contracting often acts as an institution to link farmers to an agribusiness partner in order to satisfy these requirements. Many of the commodities, grown under contract farming in developing countries, have long gestation periods and require substantial capital investment. In the light of the failure of capital markets in developing economies, contract farming can act as an institution to overcome capital market failure and thus becomes a form of interlocking factor market where the integrator supplies production material, inputs and credit and uses the future contracted, delivery of the crop as collateral. The influence of market failure on the structure of agricultural supply chains is further illustrated in Table 2.2. In conclusion, the institution of contracting has bridged missing markets in many developing countries to allow farmers the opportunity to produce high value non traditional crops (*cf.* Minot, 1986; Grosh, 1994 and Key and Runsten, 1999).

Table 2.2: Influence of market failures on agribusiness organisational strategies.

Market imperfections and transaction costs	Organisational strategy*
Imperfect credit market resulting in high costs of credit to growers – Agribusiness act as lender via contract	CF / VI
Imperfect insurance market and high PRICE risk – firm act as insurer via forward contract	CF / VI
Imperfect insurance market and high YIELD risk – firm unable to insure due to moral hazard problems	VI
Imperfect market for production information – technology, timing	CF / VI
High labour supervision costs due to crop requirements	CF / SM
Imperfect market for specialised inputs (machinery, seeds, etc)	CF / VI
Missing markets for family labour and land	CF / SM
Missing or thin local product markets	CF / VI

* CF = Contract farming; VI = Vertical integration; SM = Spot market
Adapted from Key and Runsten, 1999.

2.5.4 The Reasons for Contract Farming : A Summary

The reasons for contracting in agriculture often have a different focus in developed countries in comparison to those of developing countries. In developed countries there is always a profit motive (Baumol, 1997) and the levels of vertical co-ordination have increased because of technological economies, economies of scale, transactional economies or market imperfections (Royer, 1995). By contrast,

contracting in developing countries often incorporates a hybrid of social welfare and economic objectives (Glover, 1984; Glover, 1987; Little & Watts, 1994; Rehber, 1998). Contract farming in developing countries has been said to combine the advantages of a plantation system, where there are economies of scale in processing, better co-ordination of inputs and outputs and superior capabilities to monitor quality, with the advantages of smallholder production, where family labour is less costly and more productive (Glover, 1987). In this respect, contract farming has been suggested as a suitable way to modernise plantation type production systems that exist in many developing countries (Binswanger & Elgin, 1990; Hayami, 1998), as well as a way to transfer technology, commercialise rural farming and create a stable capitalist sector (Carney, 1994; Clapp, 1994). Simultaneously, the use of this institution can often promote the social and political goals of the state and contributes to the restructuring and industrialisation of agriculture (Goodman et al, 1987; Jaffee, 1994; Jackson & Cheater, 1994; Daddieh, 1994). Contracting has also emerged as an institutional response to missing or imperfect markets that include land, credit, insurance, marketing outlets, information, research and extension services, infrastructure, education and factor markets (Runsten & Key, 1996). Contract farming is also a particularly cost effective way to provide extension services which are estimated to reach only 30% to 40% of all farmers in developing countries (Jiggins, 1997; Rehber, 1998). Finally, the important contribution of agribusiness in developing country contracting schemes (Karen, 1985) is underlined by the role of the private sector as a source of inputs, credit, access to information, technology development, management talent and techniques that are often limited in the agricultural sector (Rudolph, 1999).

2.5.5 Advantages and Disadvantages of Contract Farming

2.5.5.1 The advantages to the producer

Contracting allows farmers to overcome the barriers of entry into many industrial crop and animal sectors. In addition, farmers entering into a contract farming arrangement usually gain access to information, technology, marketing channels, managerial skills, technical expertise, access to plant and equipment and patented production procedures (Carney, 1988; Rhodes, 1993; Glover, 1994; Clapp, 1994; Jackson & Cheater, 1994;

Little, 1994; Royer, 1995; Pasour, 1998; Delgado, 1999, Vellema, 2000). Contracting also improves access to capital and credit which are a major concern for most farmers and especially in developing countries. Farmers are, therefore, often prepared to sacrifice autonomy for the sake of increased family income (Hudson, 2000).

Contract farmers can often reduce production costs and increase production and income as a result of new technology and access to company inputs (Watts, 1994; Clapp, 1994). The reduction in cost is a result of technology, better collective decisions, reduced transport and marketing costs (Hennessy, 1996; Pasour, 1998), cheap inputs from the agribusiness partner and the ability to increase economies of scale (Royer, 1995). Technology, developed by agribusiness, is often an important factor that can reduce farmer cost (Pasour, 1998).

Contract farming reduces marketing risk and stabilises farmer income, and, in this sense, the agribusiness partner provides a form of insurance (Featherstone & Sherrick, 1992; Watts, 1994; Jackson & Cheater, 1994; Runsten & Key, 1996; Wolz et al, 1999; Flaskerud & Klenow, 1999; Martin, 1999; Colchao, 2000; Sofranko et al, 2000). Marketing risk is reduced as a result of the agribusiness contract to purchase the output of the farmer and income is stabilised because of the repetitive nature of required deliveries and payment. At the same time contracts may simplify production and marketing decisions thus improving the farmer's effectiveness. The reduction of marketing risk through the demand assurance embodied in a contract is also appealing to farmers producing products where the markets are thin (Hudson, 2000).

Contract farmers can increase profit opportunities as a result of the opportunity to produce differentiated products (Pasour, 1998) and this institution allows developing country farmers to increase income as a result of diversifying out of traditional crops (Williams, 1985; Levin, 1988; Korovkin, 1992; Glover, 1994; Von Braun & Immink, 1994; Kennedy, 1994; Delgado, 1999;Coulter et al, 1999). Profit opportunities are increased because industrial-value added crops generate higher levels of profit than traditional food and open market crops. There is widespread evidence of an improvement in farmer income in developing countries as a result of contracting (Levin, 1988; Clapp, 1994;) although the effect of an increase in cost of production is sometimes not considered when evaluating the incidence of increased income (Little,

1994). Finally, the educational experience for the contract farmer interacting with an agribusiness partner can provide a platform for farmers in developing countries who are attempting to convert from subsistence to commercial farming (Glover, 1984; Glover, 1994; Sofranko et al, 2000).

2.5.5.2 Disadvantages to producers

The disadvantages of contract farming include the loss of farmer autonomy, increased production risk, the increased market power of agribusiness and the increased concentration of production that can lead to food security problems and the long term degradation of natural resources.

It is argued by several authors (Schrader, 1986; Currie & Ray, 1986; Levin, 1988; Korovkin, 1992; Morvaridi, 1995; Pasour, 1998; Rehber, 1998; Wolz et al, 1999; Colchao, 1999; Sofranko et al, 2000) that there is a universal loss of autonomy as farmers operate under a centralised control system and the contracted farmer is sometimes reduced to no more than hired labour (Clapp, 1994). Conversely, it can be argued that the independent farmer who has high levels of debt has much the same status (Watts, 1994). It is also argued that farmers experience disadvantages due to the high level of agribusiness manipulation of the contract, in terms of both the legal and tacit arrangements, (Glover, 1984; Glover, 1987; Porter & Howard, 1997). Contract farming, in many developing countries, has also led to the undermining of traditional structures and support systems (Korovkin, 1992) and is often associated with higher levels of family conflict (Watts, 1994).

A further disadvantage is that production risk can increase as a result of the need to meet the contractual obligations of the agribusiness partner (Royer, 1995). In this sense, risk can also increase as a result of the farmer investing in highly specific fixed production assets combined with the non assurance of a permanent contract or the chance that the integrator may default (Featherstone & Sherrick, 1992; Royer, 1995; Rehber, 1998). Production risk is increased specifically in developing countries as a result of diversifying out of traditional crops into non-traditional crops where the technology has not been developed locally and farmers have no personal experience of the crop (Runsten & Key, 1996).

Contracting universally increases land-use intensity and can lead to higher levels of pollution (Runsten & Key, 1996). Contract farming in developing countries can also result in decreased food production and increased food security problems as a result of concentrating on contract crops (Glover, 1994; Clapp, 1994; Morvaridi, 1995; Rehber, 1998).

Farmers incur additional cost as a result of the need to co-ordinate their production to suit agribusiness, as well as to liase for the use of company inputs and services (Glover, 1987). It is also argued that prices paid to the contracted farmer are often less than spot market prices because of the reduction in marketing risk and the bargaining power of agribusiness. This reduction in income is especially problematic when limited supplies of food crops are produced or available on a regional basis (Watts, 1994). This situation might especially penalise a contracted farmer with high levels of capitalisation and managerial skills where an open market exists for the same crop (Runsten & Key, 1996; Rehber, 1998). Moreover, contract production often involves a high cost package of inputs that require financing facilities. The change in cost structure is especially marked in developing countries when farmers diversify out of traditional crops and can often negate the effect of increased revenue (Von Braun & Immink, 1994; Little, 1994).

2.5.5.3 Benefits to Agribusiness

The benefits to the agribusiness firm from a contract farming arrangement include the ability to control cost and quality and to reduce uncertainty with regard to the supply of a raw commodity. Cost is also reduced as a result of a more synchronised input-output processing function (Kilmer, 1986; D'Aveni & Ravenscroft, 1994; Azzam, 1996) and the cost and financing of production is passed on to the farmer (Schrader, 1986) without the loss of control (Rhodes, 1993). The company can ensure that the quality of large volumes of a raw commodity is better-controlled (King, 1992; Featherstone & Sherrick, 1992; Goodhue, 1999) and that the company technology is properly adopted by the producer (Leathers, 1999). Further advantages to the company are the ability to reduce the price paid for the raw commodity as a result of assuming the marketing risk of the contracted farmer and reducing transport costs

(Glover, 1984; Kumar, 1995). As a result of a relatively stronger bargaining position in the contractual arrangement, agribusiness is also able to influence favourable farmer commodity prices (Delgado, 1999). Contracting thus transfers the production risk to the farmer and eliminates the uncertainty of supply (Levin, 1988; Korovkin, 1992) and, because the quality of inputs is more consistent, reduces the risk of dissatisfied consumers (Pasour, 1998; Rehber, 1998; Wolz et al, 1999).

Advantages that are specific to agribusiness firms in developing countries can also include substantial political economy gains as a result of involvement in national development projects. Further advantages can accrue if government is a party to the contracting arrangement (Hayami, 1990; Binswanger et al, 1993; Watts, 1994; Little, 1994) or, alternatively, government provides favourable policy or subsidised credit (Clapp, 1994; Morvaridi, 1995). In conclusion, agribusiness is often precluded from purchasing land and contracting with local farmers can overcome this constraint. This happened in many parts of Latin America where multinational agribusiness firms used contract farming to secure a constant flow of commodities for their processing and export ventures (Runsten & Key, 1996).

2.5.5.4 The Disadvantages of Smallholder Contract Farming

A principal disadvantage frequently associated with contract farming in developing countries, is the high level of smallholder transaction costs. Transactions costs are often excessive because supply arrangements involve large numbers of small-scale farmers that are spatially dispersed, that require high levels of inputs and support and because smallholders make smaller, more frequent deliveries to agribusiness. (Key and Runsten, 1996). Excessive transactions costs are also generated as a result of the need to structure, administer and enforce a large number of contracts (Barry et al, 1992). Moreover, the agribusiness partner incurs additional supervision and monitoring costs in conjunction with the non cost effective delivery of services and inputs to farms that are small and spatially dispersed. In this regard, it is estimated that dealing with larger farmers, who make less use of inputs and deliver in greater volumes, costs less than dealing with smallholders (Runsten & Key, 1996; Key & Runsten, 1999). In this regard, Coulter et al (1999) refer to an example of horticultural

exporters in Zimbabwe who pay their smallholder suppliers 30% of the price per kilogram paid to the large-scale farmers in order to break even.

Agribusiness firms often prefer to deal with larger farmers in order to reduce transaction costs as well as for greater consistency of quality and supply. In the United States, for example, contract farms are significantly bigger than non-contract farms (Sofranko et al, 2000) and, if the raw commodity offers economies of scale and is not labour intensive, large farmers have a production advantage (Glover, 1984; Runsten & Key, 1996). Furthermore, the cost of procurement is reduced because larger producers are often located closer to highways, are quicker to respond to contracting opportunities (Von Braun & Immink, 1994) and more geographically concentrated than smaller farmers (Pasour, 1998). Large farmers, with higher levels of capitalisation and management skills, also reduce the risk of supply (Coulter et al, 1999) and have a better chance of success (Little & Watts, 1994). Larger farmers tend to be better educated, better able to adopt technology, are able to acquire specialised capital inputs more easily, require less inputs from agribusiness, require less monitoring and the larger volumes supplied reduce the cost of interaction. Furthermore, agribusiness dealings with small farmers in developing countries have often resulted in increased cost per capita with respect to administration, services rendered, transportation and communication. Moreover, smaller farmers borrow more, more frequently require the use of specialised equipment and require more intensive monitoring resulting in the increased cost per unit of raw commodity supplied. Finally, in a situation where contracting is not legally enforceable, the costs of screening potential contract farmers is a function of the number of farmers screened and, in this respect, larger farms cost proportionally less (Runsten & Key, 1996).

2.6 The lessons

A history of contract farming projects in developing countries indicates no clear picture of either success or failure. More evident is that multiple factors including country specific issues appear to influence the outcome of these relationships (Little & Watts; Runsten & Key, 1996). The reasons for the success or failure of contract farming are, thus, often a function of widely differing scenarios where the variables include history, the timing of the project, the attitudes of the participants, the choice of crop type, the choice of technology, the effect of political influences, the legal system and a range of other social and economic factors (Daddieh, 1994). In general it would appear that the success of contract farming schemes in developing countries is positively influenced by the presence of infrastructure, high levels of technology, a strong agricultural sector and sound agricultural and macro economic policy (Rehber, 1998). A checklist of key success factors for the design of small-scale farmer agribusiness contracting partnerships, primarily from the perspective of the agribusiness partner, includes the importance of commodity characteristics, the need to minimise transaction cost, the need to ensure that the co-ordination of supply and quality is optimised and the importance of contract enforcement.

2.6.1 Commodity Characteristics

The choice of crop is an important success factor. Crops selected in a contracting arrangement should have a high value per hectare and require post harvest facilities and processes that are not feasible for the farmer to invest and undertake given the economies of scale (Glover, 1984; Abbott, 1994). The production techniques and the natural conditions for the selected crop are an important influence on the viability of the contracting project. The correct matching of crop types to natural conditions, technology and plant processing facilities, results in the optimal use of the processing competencies (Abbott, 1994). The economic logic of contracting options is being increasingly evaluated in terms of how the raw commodity characteristics relate to the technology and labour requirements and some crop types display greater potential for contracting than others (Binswanger & Rosensweig ,1986; Jaffee, 1994; Delgado, 1999). In general, the supply of raw

commodities that are perishable and require high levels of technology inputs and tight quality specificity control, combined with a need for a high level of co-ordination with processing facilities, are better suited to contracting arrangements than the open market (Glover, 1984;Glover, 1987; Kumar, 1995; Runsten & Key, 1996;Rehber, 1998; Wolz et al, 1999).

Delgado (1999) stresses the importance of recognising that individual commodities have both production and marketing characteristics that will determine the optimal form of production organisation. This argument contributes to an additional perspective of explaining the structure of agricultural supply chains by suggesting that commodity characteristics influence transaction characteristics which, in turn, are best accommodated in specific governance forms. Table 2.3 summarises the relationship between commodity characteristics and the optimum form of the grower-processor supply chain. High levels of labour inputs in the growing operation favour smallholder organisation, whereas economies of scale and heavy investment requirements tend to promote large scale farming. Delgado, (1999) argues that many commodities can be efficiently supplied by small-scale farmers because high levels of costs and inputs only arise in the processing and marketing activities.

High levels of perishability tend to discourage independent small-scale operators because of the elevated risks involved in not having an assured market. Furthermore, a high value-to-weight ratio tends to be associated with greater risks in marketing and a more specialised clientele, leading to contractual or vertically integrated forms of organisation. The absence of domestic markets for export items makes it risky for independent farmers to produce outside a marketing structure that can handle these items. Finally, items such as cut flowers and vegetables, that are produced for the export market, tend to be characterised by economies of scale in marketing, as are other perishables that require a cold chain for handling where these economies of scale requirements tend to lock out independent small operators (Delgado, 1999).

Table 2.3: Commodity Characteristics and Contracting

Transaction Cost Factors	Presence of the factors at left is likely to favour the form of organisation indicated		
	Independent small operators	Contract institutions between small operators and processors/ marketers	Vertically integrated, more specialised large farms or plantations
Commodity characteristics in production:			
High labour inputs	Yes	Yes	No
Economies of scale in production	No	No	Yes
High returns to extension/ farm/research linkages	No	Yes	Yes
Complex purchased input use required	No	Yes	Yes
High investment requirements	No	No	Yes
Commodity characteristics in processing/marketing:			
Quality specificity	No	Yes	No
Perishability/need for co-ordination with processor	No	Yes	Yes
High value to weight	No	Yes	Yes
Principal market is export	No	Yes	Yes
High economies of scale in marketing	No	Yes	Yes

Source: Delgado (1999)

2.6.2 Transaction cost

Transaction cost can be explained as the cost incurred by the firm with respect to the acquisition of goods and services across technologically separate interfaces. Transaction cost can be influenced by historical legacies, the organisation structures of farmers, technology transfer and the level of mutual asset specificity.

Historical Legacies

The identification and understanding of the historical and institutional legacies that have shaped society, the property rights economics of a country and the agricultural sector, are a key element in the design of the contracting structure (Binswanger et al.

1993;Jaffee, 1994; Jackson & Cheater, 1994). The transaction costs of the contracting arrangement are a function of property rights economics and the prevailing institutional framework (Williamson, 2000). Complementing an understanding of how historical legacies have influenced the prevailing institutional framework, the assessment of the start up cost, the learning cost and the operating costs of acquiring the raw commodity from contracted farmers, are key elements that are required to address the viability of the contract farming arrangement. Growers would, mostly expect to be paid market related prices from the outset of the relationship (Runsten & Key, 1996). Furthermore, agribusiness start-up costs will be increased if they are responsible for the development of production and control systems for a new non traditional crop or animal commodity (Abbott, 1994).

Farmers' Associations

The formation of a farmers' association can be especially important in developing countries where contracting projects often involve large numbers of small-scale farmers who generate a differentially higher level of transaction cost (Little, 1994; Watts, 1994; Von Braun & Immink, 1994; Runsten & Key,1996). The formation of a farmers' association to represent small-scale farmer interests can significantly reduce agribusiness transaction costs. Farmer associations can be the most cost effective way for agribusiness to communicate with the contracted farmers and to deliver inputs and services (Von Braun & Immink, 1994; Kawagoe, 1994; Runsten & Key, 1996; Porter & Howard, 1997; Coulter et al, 1999). Farmer associations are a cost effective way for agribusiness to develop and transfer technology to large numbers of farmers where the high level of agribusiness control allied to the continuity of a long term contractual arrangement, allows the integrator to optimise this process (Abbott, 1994; Jiggins, 1997). The success of farmer associations in developing countries can be influenced by a number of factors. Generally, farmer associations have functioned better when they have a clear agenda and undertake a limited number of activities. Moreover, successful farmer associations in developing countries are limited in size, service the interests of a limited number of members and do not involve the excessive spatial dispersion of its members. These structures are also more likely to be successful if they are underpinned by existing local and national structures, if they have well maintained records and maintain a

strong democratic process that does not service the interest of a political party (Runsten & Key, 1996; Coulter et al, 1999). Despite the many advantages of establishing farmer associations, the contracted farmers often have a number of reservations with respect to being represented by this type of institution. These difficulties are influenced by the heterogeneous nature of the farmer, the farmer perception that the agribusiness partner will view the association as a threat to its authority and the presence of competitive fresh markets (Glover, 1987; Runsten & Key, 1996).

Technology Transfer

The cost and transferability of the product specific technology from agribusiness to the farmer is an essential success factor. (Glover, 1987; Rehber, 1998; Chakravarti, 1999). There is, sometimes an option of employing alternative technologies with respect to the production techniques of the grower. In the case where the commodity can be efficiently supplied using either labour intensive or capital intensive technologies, labour intensive technologies are sometimes more suited to the development needs of certain countries (Haggblade, 1987). Agribusiness can, furthermore, consider how the technology employed can influence the behaviour of the farmer and reduce opportunistic behaviour (Runsten & Key, 1996). The importance of the future cost and transferability of technology is especially important in a general trend of government withdrawal from agricultural research, development and transfer services which are being increasingly privatised (Runsten & Key, 1996; Pasour, 1998). Traditional state agricultural institutions are also losing their influence because of the wider range of services and research that have been privatised (Meliczek, 2000). This trend of government withdrawal is occurring concurrently with the globalisation of agricultural markets and amendments in international trading restrictions (Ling & Liebrand, 1995;Pasour, 1998; Rehber, 1998). Finally, costs of technology transfer should also consider legal and other costs related to the introduction of new technology. New technology could pose some serious health threats as many new products are, as yet, untested and international trade regulations, which require these products to be specifically labelled, could result in trading restrictions similar to the concerns of European Union countries (Pasour, 1998).

Mutual Asset Specificity

The degree to which mutual asset specificity can be designed into both parties' balance sheets is a key success factor that can ensure the continuity of the contracting arrangement and reduce the level of uncertainty. Mutual asset specificity will induce a higher level of interdependency between the contracting parties, reduce opportunistic behaviour and can be incorporated as a tool that raises the exit costs for both partners (Sporleder, 1992).

2.6.3 Co-ordination of Quality-Supply

The co-ordination of quality and quantity can be improved by well planned logistics, the careful identification of the participants, assessing the role of the state and by ensuring the provision of inputs.

Project Logistics

The design of the project logistics will provide key insights of the future transaction characteristics that will be generated by the grower-processor activities. The configuration of the location and concentration of growers, in relation to the processor, can be incorporated as a tool to optimise the spatial, logistical and communication factors that generate transaction costs. The logistics of the contracting arrangement are an important success factor that will contribute to reducing costs and maximising efficiency. The logistics of the contracting arrangement are an essential element of the financial viability of the project and numerous lessons in developing countries underline cases where project failure was influenced by the uneconomic location of projects that were designed, for social welfare motives, rather than on economic criteria (Glover, 1987; Runsten & Key, 1996; Rehber, 1998).

Identification of the Participants

Contract farming in developing countries often involves a range of participants in addition to the agribusiness firm and the contracted farmer. These parties, both

foreign or local, could include the host government, parastatals, international aid or lending agencies, the World Bank or the Commonwealth Development Corporation (Glover, 1994; Little & Watts, 1994). The integrator partner could also be a village level processor, or home level processing (Kawagoe, 1994;Von Braun & Immink, 1994) and growers can range from subsistence farmers to highly capitalised farmers (Little & Watts, 1994). Furthermore, a majority of contracting projects in Africa have involved the host government as a partner (Jaffee, 1994) and the incidence of pure private sector contracting is rare (Little, 1994). The issue of multiple partners in developing country contracting projects has been widely discussed as an important issue, where the high level of government involvement has frequently resulted in a conflict situation involving international donor organisations, the growers and the state (Daddieh, 1994).

The Role of the State

The role of the state needs to be identified at the design stage and, if the government is a partner, it should provide financial and infrastructure support at the very least (Goldsmith, 1985). The success of many contracting projects, especially in developing countries, is influenced by the role of the state The success of the project can be influenced by the state with respect to policies that affect prices, the development and location of infrastructure and preferential contracting agreements. The government can develop policy that influences the price, development and allocation of inputs like water, fertilisers, research, extension, credit and land (Korovkin, 1992; Von Braun & Immink, 1994; Carney, 1994; Daddieh, 1994 ; Runsten & Key, 1996). Furthermore, the state can influence the acquisition of monopsony power (Clapp, 1994), the development of suitable markets and services (Jaffee, 1994), make improvements in infrastructure and transport and institute the development of rural financial institutions (Von Braun & Immink, 1994). The agribusiness partner, who in many cases undertakes a considerable investment, can ascertain if the state intends rewarding agribusiness for taking the risk of investing in the agricultural project concerned (Glover, 1994). Agribusiness could also consider the influence of the state as a mediator to reduce contract conflict, in addition to, its ability to regulate commodity and contract prices (Abbott, 1994 ; Kennedy, 1994). In conclusion, the cost structure of contracting projects can be profoundly affected by the state's reaction

to consumer group pressures that can influence changes in product regulations (Ling & Liebrand, 1995; Runsten & Key, 1996).

Smallholder Access to Inputs

The promotion of access to services and facilities in contracting in developing countries is a vital issue that can influence the success or failure of a project. Agribusiness can favourably influence the optimal supply of the raw commodity from the contracted farmer by investing in their producer partners. This investment should ensure that the farmer has access to the company's technological and associated services, to credit, to training, to the supply of seeds and fertiliser and access to irrigated water (Abbott, 1994). The parties involved in the promotion of these facilities could include the agribusiness integrator, the government, non government organisations and farmer co-operatives. The general ability of the farmer partner to perform in a contracting project in the modern sector, often requires a considerable investment. The chances of integrating successfully will be improved if the various participants undertake to promote the development of growers, including their degree of literacy, improving business skills and providing farmer links with institutions. Other provisions in support of contracting projects could include a facility to resolve conflicts, the development of infrastructure and the support of small-scale local services. Furthermore, the chances of functional contracting projects can be improved if the government and agribusiness ensure that input suppliers adapt their packages to suit smaller scale farming technologies, that viable communication systems exist and that energy and health systems are supplied (Karen, 1985; Coulter et al, 1999)

2.6.4 Contract Enforcement Lessons

The identification-evaluation of all the parties to the potential arrangement is important and it has been suggested that the screening of participants can contribute towards the success of the project (Royer, 1995). Other important factors that can enhance contract enforcement include the presence of competitive fresh markets, property rights economics, contractual dispute, the strength of agribusiness management and a range of socio-economic issues.

Competitive Fresh Markets

The success or failure of contracting in developing countries can often be attributed to the presence or absence of a competitive fresh market allied to the strength of the legal system. A competitive fresh market can result in a serious disruption to input supplies where contracted farmers choose to sell to the fresh market instead of the agribusiness partner, who is often unable to legally enforce contractual obligations (Abbott, 1994 ;Runsten & Key, 1996; Watts, 1994; Jaffee, 1994; Rehber, 1998). The risk of non supply of the intermediate product can be reduced in a situation like this if the farmer does not have the facilities to harvest and transport the crop to market and agribusiness provides these services as part of the contract (Runsten & Key, 1996). The agribusiness partner should, therefore, ensure that the commodity can only be sold in the closed market conditions of the contracting arrangement and that the contracted farmer is precluded from selling to alternative markets (Runsten & Key, 1996).

Property Rights

The ability to define and enforce property rights is an important success factor in contracting. The strength of the judicial system, especially in some developing countries is a key factor that can contribute to the success or failure of a contracting project (Clapp, 1994: Runsten & Key, 1996; Key & Runsten, 1999). In Mexico and Africa, the level of default, combined with the inability to sue defaulting producers, has resulted in the failure of many projects involving contracted small-scale farmers (Runsten & Key, 1996; Rehber, 1998; Coulter et al, 1999). Contracting projects, in general, are more successful if both the legal and tacit arrangements are complied with and both parties attempt to promote the relationship (Watts, 1994).

Contract Dispute

Contractual disputes are considered to be one of the main reasons for the failure of contract farming in developing countries where there is a need to develop an arbitration system that involves representation of small-scale growers by the government, a farmer association or a non government organisation (Little, 1994;

Watts, 1994; Little & Watts, 1994; Runsten & Key, 1996;Rehber, 1998). The presence of mutual trust can act as an informal mechanism to improve contract enforcement by securing lower levels of opportunism and higher levels of contract enforcement (Gow et al, 1999; Fafchamps & Minten, 1999).

The farmers' perception and trust of the agribusiness partner is a key factor influencing the relationship between the parties and the agribusiness should be aware of, and consider, the effects of the manipulation of the legal and tacit arrangements of the relationship (Glover, 1984; Levin, 1988; Currie & Ray, 1986; Porter & Phillips-Howard, 1997a; 1997b; Fafchamps & Mintten, 1999; Delgado, 1999; Tregurtha & Vink, 1999). Contract farming in developing countries has been characterised by the perceived high levels of company manipulation, farmer distrust of the contractual relationship, a perception of a loss of autonomy and a degree of labour exploitation involving family members (Glover, 1987; Watts, 1994; Jaffee, 1994; Clapp, 1994; Porter & Phillips-Howard, 1997a). In this regard the company manipulation of the weight and quality of farmer supply, the charges for agribusiness services and inputs rendered to the farmer and the payment for the raw commodity supplied, are often a widespread problem for small-scale farmers (Glover, 1987;Abbott, 1994; Runsten & Key, 1996) The joint monitoring of the quality of the raw commodity supplied is suggested as a measure to reduce distrust, where a mechanism to monitor quality could include both company officials and a farmer representative present (Delgado, 1999). Furthermore, agribusiness can favourably influence the farmers' trust in the company by ensuring that the growers are happy with the remuneration system that reflects market prices. This is often difficult, however, because the company pays the contracted farmer before the processing and sale of the manufactured product (Pasour, 1998; Wolz et al, 1999). Contract farming relationships, moreover, often have a better chance of success if the contracted farmers have had a previous history of interaction with agribusiness. The agribusiness partner can further reduce conflict by allowing farmers to have alternative production possibilities to reduce production risk and satisfy food security requirements (Glover, 1994; Porter & Phillips-Howard, 1997b). In conclusion, contractual disputes with large numbers of growers are often difficult and costly to enforce, and the success or failure of the relationship is more efficiently influenced by the mutual interest of the parties involved (Babb, 1992; Abbott, 1994).

Agribusiness Management

The strength of the agribusiness management of the growers' activities is an important influence on the success or failure of projects (Abbott, 1994; McComb et al, 1994 ; Little, 1994) and many projects fail in developing countries because of the mismanagement of grower activities (Watts, 1994). The staff who interface with contract farmers have a major impact on the efficiency of the contracting project. In this regard, the agribusiness partner could ensure that employees, who act as the front line of the company, are local citizens who have an intimate knowledge of local farmers and, can act significantly to reduce contract related conflict (Porter & Phillips-Howard, 1997b; Delgado, 1999; Vellema, 2000). Local managers are better able to explain and interpret company financial statements to the farmers and the company can also consider preparing financial statements in the language of the contracted farmers (Porter & Phillips-Howard, 1997b) . A further key issue in the management of many contracting arrangements, is the control of land and water. If the land and water are privately owned by the contracted farmers, then the decision making autonomy of farmers is not affected, however, if either the land or water, or both, are under company control, it is important that both parties understand and follow the contractual stipulations and that the agribusiness partner interfaces with growers to ensure a minimum of conflict (Levin, 1988; Porter & Phillips-Howard, 1997a; 1997b).

Socio-economic Factors

High levels of contract conflict have been a feature of many smallholder contract farming projects as a result of the exploitation of family female labour (Little, 1994; Watts; 1994). The role of women in developing country farming, combined with related family conflict, is an important issue affecting success because of the high level of labour inputs supplied by women (Little & Watts, 1994; Porter & Phillips-Howard, 1997a;1997b). Contract farming, in developing countries can result in the restructuring of household labour and this issue will need to be addressed as agriculture is modernised in these countries (Carney, 1988). The availability of low cost labour, in the grower family, is often a principal reason that induces agribusiness to select contracting as a means to secure the intermediate product.

Labour is often cited as a critical limiting factor in developing countries where the burden falls on female household members to respond to an intensification of labour requirements. This increased burden, however, can often lead to increased family conflict, and, an increase in subversive behaviour that can affect the success of the respective project (Carney, 1988; Runsten & Key, 1996) because the interests of the various family members in the farm household may be divergent (Niemeijer & Hoorweg, 1994) Finally, it is important to ensure that payment for the raw commodity produced is directed towards the person in the farmer household, male or female, who is responsible for the contracting workload (Glover, 1994; Delgado, 1999).In reality, however, this can still be difficult where the household head is a women who cannot legally acquire title to land (Porter & Phillips-Howard, 1997a; 1997b) and male family members often retain contract payments without informing other family members of the amount nor including them in household income decisions (Williams,1985).

2.6.5 The Lessons of Small-Scale Supply

The choice of large scale versus small-scale suppliers can have a fundamental influence on the level of agribusiness transaction costs. The economic viability of contracting projects is often adversely affected by the presence of large numbers of small-scale growers. Increased farm size is a feature of contracting in developed countries where contract farms are significantly bigger than non contract farms. The reason for this is primarily an agribusiness need for the scale and continuity of supply and economies of scale for the farmer (Sofranko et al, 2000). A history of contracting reveals that agribusiness integrators prefer to deal with larger farmers in both developed and developing countries in order to reduce transaction costs and because of the need for greater consistency of quality and supply (Runsten & Key, 1996; Key & Runsten, 1999). The choice of supplier is often determined by crop type. Crops that promote mechanisation and economies of scale often favour larger producers who can acquire capital inputs on a more cost effective basis (Rehber, 1998; Delgado, 1999). Conversely, a crop that requires low levels of mechanisation and high labour inputs, may be better suited to small-scale farmers who have a lower opportunity cost of labour. Small-scale farmers, in this regard, have higher levels of personal incentives than large producers who are often faced with incremental

supervision costs similar to those of plantation type farming systems (Watts, 1994; Haggblade, 1987; Runsten & Key, 1996).

Agribusiness dealings with small-scale farmers in developing countries have often resulted in increased cost per capita with respect to the administration requirements of small-scale growers, the increased level of services rendered and the incremental transportation and communication costs incurred. Small-scale farmers borrow more, more frequently require the use of specialised equipment, require more intensive monitoring and they make more frequent deliveries of smaller quantities to the integrator resulting in increased cost per unit of the raw commodity supplied (Little, 1994; Watts, 1994; Runsten & Key, 1996).

2.6.6 Contracting Lessons in South Africa

The legacy of apartheid and its effect on black-white relations remains a vital consideration with respect to the establishment of contract farming in South Africa where small-scale farmers, mostly, see contracting as a means to participate in high value crop production, as well as secure access to inputs like credit and fertiliser (Porter & Howard, 1997a; 1997b). The development of trust between agribusiness partners and contracted growers, especially emergent small-scale black farmers, will, therefore, be a vital pre-requisite to ensure the success of future vertical co-ordination partnerships in South African agriculture. A lack of trust has been demonstrated to increase transaction costs in the wine industry (Weatherspoon et al, 1999) whilst the development of trust in the beverage industry has reduced the transaction cost of small-scale farmer barley supply (Tregurtha & Vink, 1999). Other issues that have emerged in South African small-scale contracting partnerships are the unequal power relationship between agribusiness and the farmers (Mbongwa et al, 1996; Machethe et al; 1997), the potential problems over company control of water, the leading role in production played by women and the low level of food self sufficiency in the farmer household because of family labour concentrating on contract production (Porter & Howard, 1997a; 1997b).

The issue of property rights in South Africa will be especially important with respect to the enforcement of contracting arrangements. Many small-scale farmers, in the

former homeland areas, have various rights of access to land as defined by Proclamation R 188 of 1969. Land access is usually by virtue of membership of a community and not through sale, lease or rent. In many instances, only men are entitled to inherit land rights and individuals do not own their residential and arable allotments, but rather are allowed the right of occupation and cultivation as stipulated by the tribal authorities. According to some surveys, only 15% of land in the former homelands is held on freehold or conditional title (Levin, 1988; Kirsten & Van Zyl, 1996). African freehold, moreover, rarely belongs to a single entrepreneur but rather to the extended family or a syndicate (Van Zyl et al, 1996). Although several of the Native Lands Acts that specifically segregated land on a racial basis and restricted Africans to certain types of land tenure, have been set aside in the 1990's, land reform and the transformation of the agricultural sector have been slow (Van Zyl & Kirsten, 1999).

2.6.7 Miscellaneous Lessons and Issues

The volatility of world prices with respect to raw commodities and finished products can profoundly affect the viability of the relationship for both parties in a contracting arrangement and the agribusiness needs to ensure that the continuity of supply is maintained in times of depressed prices by setting a contract price that is acceptable to the farmer (Levin, 1988; Watts, 1994; Abbott, 1994; Jackson & Cheater, 1994; Little, 1994). Price fluctuations, outside the control of the farmer, can result in a situation where the farmer is faced with a cost-price squeeze, namely, higher productions costs and lower prices (Glover, 1987) and adverse prices have been a major cause of project failure in developing countries (Little, 1994; Watts, 1994).

Increased levels of contracting have been associated with the concentration of production in both developed and developing countries and increased output per farm has often resulted in higher levels of pollution and land degradation (Pasour, 1998;Rehber, 1998). Contract farming also discourages the production of food crops in developing countries and promotes mono-culture systems. These systems are often regarded as non sustainable, as contributing to higher levels of natural resource degradation and elevating food security problems (Glover, 1984;Kennedy,

1994 ; Wolz et al, 1999). Conversely, it has been suggested that contracted farmers in developing countries use a higher proportion of their land than traditional farmers and that food production is not jeopardised (Kennedy, 1994). Increasing levels of global attention are being placed on the impact of pollution and degradation in both developed and developing countries. In this respect, it has been suggested that the lack of a strong legal system, typical of many developing countries, can further exacerbate the problem of land degradation (Runsten & Key, 1996).

It has been speculated that the market price of raw commodities could become less public and less reliable as vertical integration increases and open market transactions decrease. Open market transactions are increasingly being replaced by closed market, private transactions between producers and integrators within the same supply chain. (Pritchett & Liu, 1998). Finally, increased levels of vertical integration may contribute to a reduction in competition in the market place for both producer inputs and outputs and it has been suggested that farmers will lose their bargaining power when traditional markets cease to exist (Pasour, 1998).

2.7 Summary and Conclusion

This chapter has evaluated the institution of contract farming and the research questions against the backdrop of the international experience of contracting in both developed and developing countries. The chapter firstly developed a definition of contracting, before describing some of the different types of contractual relationships that can exist. A brief history of contracting was then examined before exploring some of the forces that have influenced the increased levels of vertical co-ordination in both developed and developing countries. The increased incidence of contract farming was then explained as a result of the effect of missing-imperfect markets in the agricultural sector, before a general summary of reasons was assembled to explain why the industrialisation of agriculture has resulted in increased levels of vertical co-ordination. The advantages and disadvantages of contracting were outlined in order to ensure that the lessons developed in the chapter could be related to tangible economic benefits or cost.

The chapter concluded by developing a series of lessons that could be used as a basis to complement the design of smallholder contracting models. These lessons include the importance of commodity characteristics, the management of transaction cost, the co-ordination of supply and quality and contract enforcement. The design of contracting arrangements is more likely to be successful if agribusiness appreciates both their own and the small-scale farmer motivation for entering into a contract relationship. The lessons, in conjunction with other issues, identify pertinent data that can be addressed in the case studies conducted in Chapters Five and Six, as well as contribute to the design of a smallholder contracting model in Chapter Seven.

3.1 Introduction

The objective of this chapter is to illustrate how economic theory can provide a better understanding of transaction cost, as well as to explain the economics of organisation structure from a transaction cost theory perspective. The chapter, therefore, builds on the emerging importance of organisation structure and transaction cost as discussed in previous chapters. A further objective of this chapter is to provide a theoretical basis to develop a conceptual framework that can be applied to the analysis of the case studies.

The chapter commences by discussing the design of organisation structure as a component of management control systems (MCS). This section also discusses design in relation to developments in economic theory like organisational economics. The chapter then develops a resume of transaction cost theory to explain the economics of the firm in the context of its organisation structure. This section introduces the concept of a vertical co-ordination continuum of governance forms that can be used to coordinate economic activity. The characteristics of supply chain transactions are then discussed, before a transaction cost approach is developed, to demonstrate that the transaction characteristics of a supply chain influence the structure of the governance form that co-ordinates the respective activities. The chapter then employs a multiple economic theory approach to demonstrate how a range of social-historical variables influence the prevailing institutional framework of society that, in turn, provides unit level constraints to the transaction costs of the individual firm. Finally, a summary and conclusion are developed.

3.2 Economic Theory and the Design of Governance Structures

A primary objective of management is to integrate the design of governance forms with decision making and control motives (Dietrich, 2001). The design of governance forms plays a central role in the firm's ability to analyse performance and determine reward structures (Walker, 1998; Anthony & Govindrajan, 2001). Control systems are bett~~er able~~ to demonstrate the economics of performance and structure if a theory of

the firm approach is incorporated in the design of these control systems (Dietrich, 2001; Walker, 1998). An understanding of the economics of the firm is especially important in the currently changing environment that has witnessed dramatic changes in information technology, more competitive markets, different organisation structures and new management practices (Burns and Scapens, 2000). Recent developments in economic theory, namely organisational economics, have provided an ideal opportunity to apply new approaches to understanding and evaluating the managerial and organisational environment of many industries that are undergoing structural change (Barry et al, 1992).

The theory of the firm attempts to explain the emergence, size, boundaries and performance of the firm (Rowlinson, 1997). A number of theories of the firm have been developed over time, however, Demsetz (1988) states that in two hundred years only two works have seriously challenged the neo-classic theory of the firm. They are the assumption of risk, uncertainty and profit by Knight in 1921 and a transaction cost approach of explaining the firm that was pioneered by Ronald Coase in 1937. Khalil (1996) adds a further challenge by including the work of Veblen in 1898 and Alchian in 1951 that sees the firm as a path dependent learning entity. Transaction cost theory has, largely, explained the relationship between the transaction characteristics of the firm and organisation structure (Coase, 1990; Williamson, 1979; 1981; 1988). Transaction cost economics has positioned itself in the centre of economic organisation theory and has been developed on the basis of the technical, human and behavioural nature of the firm, where the concepts of bounded rationality and opportunism are key factors that distance this theory from neo-classical economic theory (Groenewegen, 1996). Transaction cost theory assumes that economic actors will behave in an opportunistic manner if the circumstances of the transaction permit them to do so (Rowlinson, 1997) and that opportunistic behaviour, like dishonesty and exploitation, increases transaction costs for one of the parties involved. Conversely, the human behavioural characteristic of trust can reduce transaction costs (Akerlof, 1988; Dietrich, 1996; Gow et al, 1999; Fafchamps & Minten, 1999; Dean, 2000a) because trust eliminates opportunism. Trust, in this context, is a function of the cost of default, knowledge and emotional bonds (Adams & Goldsmith, 1999). Finally, transaction cost economics, like agency theory, has been developed on the basis of contract theory that sees the firm as a

"nexus" of contracts (Reve, 1995). Transaction cost theory, in this sense, can be likened to the theory of optimal contracts (Seifert & Priddat, 1995).

The emergence of organisational economics has been matched with higher levels of recognition of the importance of organisational architecture (Brickley et al, 2001). Organisational economics embraces a number of individual theories of the firm to explain the emergence, size and performance of the firm. Organisational economics has emerged out of the critiques of neo-classical theory where some schools of thought see these new theories as being compatible with neo-classical economics, whilst others totally reject this assumption (Rowlinson, 1997). Organisation economics, incorporating both managerial and behavioural theory, embraces a number of economic theories of the firm. These are transaction cost theory, game theory, agency theory, property rights theory and evolution theory. The resource based approach of strategic management theory is sometimes seen as a fifth school of thought in organisation economics. These schools of thought are not mutually exclusive and organisation economics is synonymous with the new institutional economics (Mahoney & Pandian, 1992; Foss, 1995; Rowlinson, 1997). Despite progress towards understanding institutions, they are still not fully understood because they are complex. They are complex because they are systems that recognise more than one ultimate principal and corporate situations are often simultaneously social and economic (Barney & Ouchi, 1988; Williamson, 2000). A single theory of the firm is simply unable to provide a comprehensive explanation and an integrated schema of theories is required to explain the emergence, size and performance of the firm (Groenewegen & Vromen, 1996; Pitelis, 1996; Williamson, 1996;2000).

3.3 The Economics of Governance Structure: A Transaction Cost Theory Approach

This section illustrates from the literature how the use of transaction cost theory can be applied to select the optimum governance structure to co-ordinate a set of activities. A review of transaction cost theory is developed before discussing organisation structure and the characteristics of transactions. Transaction cost theory is then applied to demonstrate that the transaction characteristics of the firm, influence its choice of governance structure.

3.3.1 Transaction Cost Theory: A resume

A transaction is described as occurring when goods or services are transferred across a technologically separable interface where these interactions occur as a result of technology, the division of labour, locations, markets or people. One stage of activity terminates and another begins (Rowlinson, 1997). Transactions can involve discrete market transactions, hierarchical managerial transactions, recurrent contract transactions or relational transactions (Ring & van den Ven, 1992) . Transaction cost is thus the cost of exchanging goods and services (Foss, 1995) and results from the search for information, the cost of measurement, contracting costs, monitoring costs and the cost of enforcing agreements. These costs can be extended to include the production facilities costs, the co-ordination costs and the communication costs of the firm (Pitelis, 1996; Cordella & Simon, 2000). Transaction cost can be viewed as the economic counterpart of friction in a mechanical system. Transaction cost theory assumes firms seek to reduce this friction which includes the costs of information asymmetry, bounded rationality, opportunism, identifying suitable trading partners, specifying and detecting quality and gathering information. Friction can be described, in this context, as costs that arise when individuals exchange ownership rights to economic assets and enforce their property rights (Rowlinson, 1997). Furthermore, friction includes determining contract terms, paying agent fees and negotiating, monitoring and enforcement costs (Williamson, 1981; Hobbs & Young, 1999 Transaction cost economics seeks to explain why some activities interface within the firm and others with the market and this theory suggests that the transaction should be regarded as the ultimate economic unit of analysis with respect to the theory of the firm (Coase, 1990; Williamson, 1986; 1988; Klein et al, 1988; Barney & Ouchi, 1988; Foss, 1995; Rowlinson, 1997) .

The key features of transaction cost theory are based on the thought that specific institutional arrangements emerge in response to transactions in order to minimise cost and the development of a theoretical framework that could be subjected to empirical verification structures (Williamson, 1986; Williamson, 1996; Groenewegen, 1996). These key features view transaction cost economics as a micro-analytic approach to the investigation of the firm that incorporates the following assumptions, namely, the assumption of bounded rationality and opportunism, the economic

importance of asset specificity and a reliance on comparative institutional analysis rather than marginal analysis. Other features include the assumption of the firm as a governance structure rather than a production function and an emphasis on the ex post implications of contracting (Williamson, 1979). Additional key features are that the transaction is the basic unit of analysis and that transaction characteristics can be described in terms of their frequency, uncertainty or the degree to which they are determined by operational assets. It is, furthermore, assumed that governance forms display unique attributes of cost and competence and each governance form is supported by a distinctive form of contract law. Specific transaction characteristics are assumed to be better suited to certain governance forms in order to economise on cost efficiency (Williamson, 1996). The operationalisation of transaction cost theory is a key concept and involves characterising transactions and matching these to cost minimising governance structures (Williamson, 1986; Williamson, 1996; Groenewegen, 1996) where an understanding of the characteristics of transactions has contributed towards an understanding of the problems of designing an organisation structure (Joskow, 1988).

Transaction cost economics adopts a contractual approach to the theory of the firm and proposes that any issue that can be explained in terms of a contracting problem, can be evaluated in terms of transaction costs that are generated as a result of the exchange of goods and services involved (Williamson, 1979). Contract theory, thus, describes the firm as **a** nexus of internal and external contracts that co-ordinate activities both inside and outside the firm (Barney & Ouchi, 1988; Demsetz, 1988; Williamson, 1988; Reve, 1995; Groenewegen, 1996; Khalil, 1996; Zylbersztajn & Farina, 1999). Transaction cost economics can be likened to the theory of optimal contracts where the contracts are extremely sensitive to minor changes in the transactors' personal characteristics of risk, information, collateral and assets (Seifert & Priddat, 1995). Behavioural characteristics, like bounded rationality, result in incomplete contracts that cause hold ups that impact on transaction costs and require incentive and enforcement mechanisms (Zylbersztajn & Farina, 1999). Transaction costs in a contracting arrangement occur because of contractual hazards in the form of opportunism, uncertainty, bounded rationality and small numbers of players. These costs are also influenced by information asymmetry and asset specificity and specific transactions, in the form of contracts, are sometimes cheaper to internalise in the firm

structure than conduct in the market place (Reve, 1995). Finally, transaction cost theory assumes that a distinctive form of contracting can be related to every governance form in a vertical co-ordination continuum of organisation structure alternatives that range from open market co-ordination to full vertical integration (Williamson, 1996).

Transaction cost theory has a number of limitations. The property of power, which is thought to impact on the emergence and efficiency of the firm, has not been properly incorporated in transaction cost theory (Pitelis, 1996). Power has been cited as a motive for human behaviour in the organisation (Zylbersztajn & Farina, 1999) and a critical dimension of ex post contractual relationships and, hence, transaction costs (Dietrich, 1996). This can be clearly demonstrated by rational capital market lenders who prefer to interact with organisations with undemocratic management structures because of the lower level of hazard. These type of organisations can thus secure capital at a cheaper rate than rival organisations that have democratic structures(Williamson, 1996; Pitelis, 1996).

This study argues that the use of transaction cost literature can be employed to better understand the economics of agricultural supply chains that include small-holder contracting arrangements. Firstly, contracting arrangements can use transaction cost theory as a basis to structure the contractual conditions. The conditions of the contract, the possibility of small farmer opportunism and moral hazard and the nature of the transactions between the parties, can all be evaluated in the context of transaction cost theory in order to minimise transaction cost, select the optimum organisation structure and ensure smallholder efficiency.

3.3.2 Transaction Cost Theory and Organisation Structure

A range of factors can influence the organisation structure of the firm and different organisation structures arise as a result of different strategies of growth (Pitelis, 1996). Four primary factors affect the organisation structure of firms, namely, the volume of production, the geographical dispersion of the operating units in the firm, the product range and the innovation of new products (Rowlinson, 1997) where the choice of structure is viewed as a strategic management option (Westgren, 2000).

Organising, furthermore, is the establishment of a framework within which required activities are to be performed and the designation of who should perform these activities (Drury, 1996). This framework includes both the firm hierarchy, encapsulated within the boundaries of the firm and the other activities in the supply chain. Organisation structure, therefore, also determines the manner in which certain activities, outside the firm boundaries, are co-ordinated with the activities performed within the firm hierarchy (Brickley et al, 2001). A supply chain can consist of a single firm that undertakes all the necessary activities, or, alternatively of a number of separate firms that are co-ordinated in some fashion. Table 3.1 illustrates a range of governance forms that can be employed to co-ordinate the activities of a supply chain. These governance forms can range from the spot market, where market forces co-ordinate the necessary activities, to fully internalised structures where the transaction is co-ordinated within the firm's boundaries. In the first instance, the co-ordination of the grower and the processor activities is the result of market related forces, whereas, in the second instance, the co-ordination of these activities is one hundred percent managed within the company hierarchy. Falling between these two extreme examples of co-ordinating economic activity, the firm can employ other alternative structures that include specification contracting, alliances, joint ventures and other hybrid structures (Mahoney, 1992; Hobbs & Young, 1999).

Table 3.1: Vertical Co-ordination Continuum

Co-ordination of supply chain	**100 % market**	**Low-medium Managed**	**Medium Managed**	**High Managed**	**100 % managed**
Governance Form	Spot Market	Specification Contracting	Strategic Alliance	Formal Co-operation	Full Vertical integration

Source: Petersen & Wysocki (1997; 1998)

This range of organisation structure options has expanded Ronald Coases's original assumption of either hierarchy or the market as the only governance form options (Barney & Ouchi, 1988). This range of structures, namely, the vertical co-ordination continuum, based on the work of Ronald Coase and Oliver Williamson, has become a central feature of transaction cost economics (Williamson, 1988; Petersen & Wysocki, 1997;1998; Adam & Goldsmith, 1999; Hobbs & Young, 1999; Barjolle & Chappius, 2000).

The structure of organisations becomes increasingly complex as the firm moves away from market based transactions towards full integration (Adams & Goldsmith, 1999). The vertical co-ordination continuum assumes that the production of goods is co-ordinated by a continuum of alternative governance forms that are adopted on the basis of their efficiency and that competition ensures organisations remain efficient (Barney & Ouchi, 1988). The boundaries of the organisation are, thus, a vital concept with respect to their impact on the efficiency of the organisation and the degree to which transactions are co-ordinated internally (Williamson, 1981). Firm size is a trade off between production efficiency and transaction efficiency for intermediate goods (Liu & Yang, 2000) where the limits to firm expansion are imposed by market competition among firms (Rosen, 1988). Some of the choices of organisation form involve hybrid structures where the boundaries of the firm are unclear. As an example, one form of hybrid, called a strategic fuzzy alliance, involves a structure where the boundaries between firm and the market are not clear and trust is a key factor that co-ordinates the actors (Adams & Goldsmith, 1999). Although a specific governance structure mode can normally be aligned with contract law, firm boundaries are fading as hierarchical systems exist across firm-market boundaries (Zylbersztajn & Farina, 1999) and a number of hybrid structures involve the joint use of assets (Westgren, 2000). In conclusion, well established legal systems in the Western world facilitate highly complex contracting (North, 1997) whilst poorly established property rights in many developing countries preclude this (Runsten & Key, 1996)

3.3.3 The Transaction Characteristics of the Firm

The characteristics of a firms transaction's to secure goods and services are influenced by the degree of uncertainty relating to the transaction, the degree to which the transaction is influenced by the assets of the contracting parties and the frequency of the transactions. Combinations of these transaction characteristics of uncertainty, asset specificity, duration, flexibility and frequency, that occur within the institutional matrix of the firm, can, in turn, be matched with different contractual modes that range from classical to relational contracting (Williamson, 1988; Mahoney, 1992; Eggertson, 1995; Petersen & Wysocki, 1997; 1998; Zylbersztajn & Farina, 1999).

Uncertainty is sometimes regarded as the most critical transaction characteristic, with frequency the least critical and asset specificity impacting on both uncertainty and frequency (Williamson, 1988). Risk and uncertainty are directly associated with the duration of the contract, the information that is available and the level of control (Ring & van den Ven, 1992). Furthermore, incomplete information, information asymmetry and opportunism create uncertainty (Foss, 1995). These factors, in turn, impact on transaction cost because of the resultant imperfect information system (Cordella & Simon, 2000). The level of uncertainty can also be affected by the level of trust that exists between the contracting parties (Ring & van den Ven, 1992) as well as by commodity specific cycles that affect certain industries in cyclical patterns (Ruth & Cloutier, 1998).

The transaction characteristic of asset specificity could include specialised physical capital, site specific assets, human assets, co-ordination or temporal specificity requirements. The presence of these characteristics increases the possibility of opportunistic behaviour and, thus, the cost of contracting. In the case of temporal asset specificity, high levels of co-ordination cost are required in the input-output function that links the supplier and the manufacturer (Klein et al, 1988; Williamson, 1988; Foss, 1995). In all cases of asset specificity, a degree of dependency is induced into the contractual relationship (Petersen & Wysocki, 1998). Furthermore, the characteristics of the product can affect the related transaction dimensions. The drivers of product characteristics include a range of technological, regulatory or socio-economic factors that impact on its characteristics of perishability, differentiation, quality, and new consumer preferences. In this respect, perishability causes uncertainty for both buyer and seller, as well as an increase in transaction complexity and quality cost whilst product differentiation will require increased information and quality cost (Delgado, 1999; Hobbs & Young, 1999; Barjolle & Chappius, 2000). Transaction characteristics that involve technical change are becoming increasingly more complex with respect to the development and protection of new technology. In this respect, an additional characteristic of privacy can be added (Williamson, 1988). Other characteristics of transactions include task programmability and non-separability. Task programmability is the degree to which the agent's tasks can be broken down into finite observable outcomes, whilst non-separability relates to the characteristics of the output and

how easily it can be monitored. The higher the degree of programmability, the lower the level of supervision required and the higher the degree of non-separabilty, the more difficult it is to determine the unit of output. (Mahoney, 1992).

3.3.4 Matching Transaction Characteristics and Organisation Structure

The optimum choice of organisational structure incorporates both a strategic and an industrial organisation concept. These concepts include a structure that recognises the competencies of the firm, combined with a structure that co-ordinates the activities and resources of the firm in the most efficient manner. The optimum organisation structure is, thus, the most efficient match of competencies and activities that need to be co-ordinated both within, and outside the firm boundaries (Mahoney, 1992). Profit maximising firms will undertake those activities they find cheaper to administer internally rather than purchasing in the market (Klein et al, 1988). Transaction cost theory proposes that the selection of an optimum organisation structure, that will maximise the efficiency of the firm, is a result of matching the characteristics of its transactions with the most suitable governance form along the vertical co-ordination continuum. Table 3.2 demonstrates the operationalisation of transaction cost theory. Transaction cost economics seeks to explain why some activities interface within the firm and others with the market where this theory suggests that this choice is based on minimising transaction cost (Coase, 1990; Williamson, 1986;1988; Klein et al, 1988; Barney & Ouchi, 1988; Foss, 1995; Rowlinson, 1997).

3.3.4.1 The Operationalisation of Transaction Cost Theory

In response to the need to minimise transaction cost, transactions become increasingly internalised along the vertical co-ordination continuum as their characteristics of frequency, risk and asset specificity increase. The firm, in direct response to the increased levels of frequency, asset specificity and uncertainty, will move away from spot market trading, where market forces co-ordinate these transactions, to a governance form that, increasingly, internalises the transaction and incorporates higher levels of managed co-ordination (Ring & van den Ven, 1992; Groenewege, 1996; Adams & Goldsmith, 1999). This concept attempts to match combinations of transaction characteristics with the most suitable governance

form along a vertical continuum of opportunities. Table 3.2 illustrates that as the level of transaction frequency, uncertainty and asset specificity increase from low to high, the most suitable choice of governance structure moves away from spot co-ordination market, namely, 0% managed co-ordination, to higher levels of managed co-ordination, namely, from 0% to 100%.

Table 3.2: Matching Transaction Characteristics with Governance Forms

Transaction Characteristic	Spot Market	Specification Contracting	Strategic Alliance	Formal Co-operation	Full Vertical Integration
Frequency	Low	Low-medium	Intermediate	Int.-high	High
Uncertainty	Low	Low-medium	Intermediate	Int.-high	High
Asset Specificity	Low	Low-medium	Intermediate	Int.-high	High
Degree of Managed Co-ordination	0%	Low-medium	Intermediate	Int.-high	100%

Source: Williamson (1988) and Petersen & Wysocki (1997;1998)

3.3.4.2 Contract Theory and Organisation Structure

In support of the relationship between the transaction characteristics of the firm and organisation structure, contract theory suggests the firm will position itself on the vertical co-ordination continuum on the basis of the degree of contractual hazard and the choice of governance form can thus be related to the choice of a contracting relationship (Williamson, 1988; Williamson, 2000). The choice of contractual form is, therefore, fundamentally dependent on the transaction characteristic of uncertainty between the parties. The degree of uncertainty is influenced by the frequency of the transactions and the degree to which the transactions are influenced by asset specificity. If some degree of uncertainty is assumed in the transaction, then the transaction need only be characterised in terms of frequency and asset specificity in order to match it with the most suitable form of contract.

Various forms of contracting are best suited to different levels of uncertainty. Since the firm has been described as a nexus of contracts (Rowlinson, 1997), these different forms of contracting can be related to the different governance structures along the vertical co-ordination continuum (Williamson, 1988). According to contract theory, classical contracting would be the most suitable contracting form for standardised transactions that are infrequent and involve a low level of asset specificity, uncertainty and trust. This form of contracting, in turn, is adequately accommodated in the

governance form of spot market transactions (Williamson, 1975, 1979; Mahoney, 1992; Adams & Goldsmith, 1999). Conversely, a neo-classical contracting structure is best suited to an arrangement where a substantial investment in set up costs has been incurred by one of the parties, as well as a degree of idiosyncrasy. This form of contracting would be best accommodated in an intermediate governance structure, like a joint alliance, where higher levels of managed co-ordination exist and it would be possible to customise the set of conditions (Williamson, 1979). Relational contracting is most suitable for a set of idiosyncratic transactions involving a high level of uncertainty, frequency, asset specificity and non standardisation. This form of contracting is best accommodated in governance forms with high levels of managed co-ordination like a formal alliance or full financial vertical integration (Williamson, 1975, 1979; Mahoney, 1992; Adams & Goldsmith, 1999).

3.3.4.3 Transaction Characteristics and Contract Structures

Transactions that involve high degrees of complexity, privacy and co-ordination are all more suited to higher degrees of managed co-ordination (Williamson, 1979) The operationalisation of transaction cost theory presumes that each set of matching conditions occurs under a given level of uncertainty, where an increase in uncertainty would tend to drive the need for higher levels of managed, as opposed, to market co-ordination (Williamson, 1979). Table 3.3 illustrates the relationship between the transaction characteristics of frequency, asset specificity and the most suitable contracting form where some degree of uncertainty is assumed. As frequency and asset specificity increase, the most suitable form of contracting moves from classical to relational. Governance structures along the vertical co-ordination continuum can, thus, be adopted on the basis of the characteristics of the contract (Williamson, 1975, 1988; Mahoney, 1992) where standardised transactions require less specific structures and are more suited to the market, whilst non standard transactions require structures with higher levels of internal co-ordination (Williamson, 1988).

Table 3.3: Matching Transaction Characteristics with Contracting Forms

	1. Low Asset Specificity	2. Mixed Asset Specificity	3. High Asset Specificity
Transaction Frequency			
1. Occasional	Open Market Co-ordination = Classical Contracting	Hybrid Structure for medium level of managed Co-ordination = Neo-classical contracting	Hybrid Structure for medium to high level of managed control = Neo-classical contracting
2. Frequent	Open Market Co-ordination = Classical Contracting	Hybrid Structure for High levels of managed control = Relational Contracting	Vertical Integration for 100% managed co-ordination = Relational Contracting

3.3.4.4 The Organisation Structure Function

The relationship between organisation structure and transaction characteristics, according to the literature (Barney & Ouchi, 1988; Demsetz, 1988; Mahoney, 1992; Foss, 1995; Groenewegen, 1996; Williamson, 1981; 1988; 1996; 2000), can be represented as follows:

$$OS = f(F, U, AS)$$

Where OS = Organisation Structure, F = transaction frequency, U = transaction uncertainty and AS= asset specificity.

In conclusion, the suggested relationship between the transaction characteristics of the firm and organisation structure has been overwhelmingly confirmed by empirical testing (Masten, 1996; Williamson, 1996; 2000).

3.4 The Economics of Transaction Characteristics

Although the literature has adequately demonstrated the relationship between the transaction characteristics of the firm and the necessary level of managed control, as demonstrated by its governance structure, the economics of the transaction characteristics are less eloquently explained. The economics of transaction characteristics can be demonstrated by a two stage process developed by Williamson (2000).

The first stage of this approach assumes that the history-natural conditions of a country influence the institutional framework and property rights economics of a society. The second stage then demonstrates how the institutional framework of a society influences the transaction cost of the firm.

3.4.1 A Multiple Theory Approach

The performance of the firm is subject to a wide range of institutions and market forces (Groenewegen, 1996; North, 1997; Williamson, 2000) and the emergence of firms calls for a different theory than the dynamics of existing firms (Groenewegen & Vromen, 1996; Williamson, 2000). Although performance is partially explained by the various theories, there is a realisation that no single theory of the firm is able to embrace the complexity of variables involved (Pitelis, 1996; Williamson, 2000). The concept of theoretical pluralism, therefore, demonstrates that a more integrated theoretical framework is required to fully explain the economics of the firm (Groenewegen & Vromen, 1996; Pitelis, 1996). This approach proposes that each of the theories of the firm contributes a partial explanation and that the individual theories can be consolidated to develop a more comprehensive economic theory to explain the emergence, size and performance of the firm (Groenewegen & Vromen 1996). Theoretical pluralism can only exist if the basic tenets of the various theories of the firm do not disagree with each other and this approach assumes that the individual theories of the firm each contribute a set of inclusive variables that can be linked.

Institutions are exposed to a wide range of forces that include changes in prices, population growth, military alliances, capital accumulation, demographics, technology and information management (North, 1997) Moreover, the impact of a country's property rights, customs, laws, culture and political structures need to be captured inclusively in economic theory that recognises and develops a formal multiple theory perspective to understanding the firm (Williamson, 1996;2000; Doner & Scneider, 2000). Firms evolve under a wide range of selection pressures that include a set of interdependent institutions that are a function of both the formal and informal rules of societies. The firm, therefore, includes the formal organisation hierarchy, the institutional environment and the institution of the individual. Given the various levels of the institutions, the firm attempts to optimise efficiency under conditions of resource constraints, environment constraints and the behavioural constraints of bounded rationality, opportunism and self interest (Williamson, 1996; North, 1997).

The inadequacy of a single theory of the firm approach can be demonstrated in a number of respects. Firstly, the current theories of the firm cannot account for the asymmetry of power or purposeful action and there is a need to demonstrate a unique difference between commercial contracting and employment in order to determine the boundaries of the firm. It has been proposed that if suppliers become incorporated in organisational goals, this can be used as a guide as to whether or not to extend the firm boundaries to incorporate them (Khalil, 1996). Secondly, transaction cost economics introduces contractual phenomena under an economising lens that is characteristic of neo-classic theory by seeking to minimise cost as a result of adopting the most efficient structures. On the other hand, neo-classical economics seeks to maximise profit by the optimal utilisation of the current, static set of production techniques. In both cases, there is an underlying principle of cost minimisation (Williamson, 1979). Transaction cost theory thus subscribes to economising behaviour but modifies conditions where rational actors are replaced by bounded rationality and opportunism and perfect information is replaced by uncertainty. Furthermore, property rights theory, agency theory and evolution theory share an economising focus with neo-classical economics and transaction cost theory, but assume the same behavioural characteristic of rationality as neo-classical economics (Groenewegen & Vromen, 1996). In turn neo-classical economics has been subjected to modifications that its proponents argue, make it compatible with

new developments regarding the theory of the firm. Thus the maximisation of profits in neo-classical theory has been replaced by constrained maximisation that concurs with transaction cost theory which seeks to optimise the performance of the firm under a given set of conditions (Groenewegen & Vromen, 1996) Finally, the impact of competitive market forces shaping organisation structure in transaction cost theory (Williamson, 2000), subscribe to evolutionary theory (Groenewegen & Vromen, 1996).

3.4.2 The Williamson Three Stage Economising Model

Williamson (2000) proposes a multiple theory of the firm approach to explain structure and performance in Table 3.4. This approach is incorporated in an interdependent four level schema that sets out a three stage economising process for the firm. The four level schema includes the historical legacies-institutions of a society, the property rights-judiciary of a society, the transaction characteristics of the firm and the economics of the input-output function. Williamson (2000) proposes that the history of a society, regarded as the level one schema, evolves over a period of a hundred to a thousand years and results in embedded traditions, culture and norms that influence the economics of the level two schema. This level, namely the economics of property rights and the judiciary, evolves over a period of ten to a hundred years. First stage economising involves the firm attempting to influence the economics of level two schema. Both level one and two schemas provide inputs, or are explained by, principal agent theory, evolution theory, property rights theory and the resource based view of the strategic theory of the firm. These forces, in turn, impact on the transaction costs of the firm, namely, the level three schema. This schema views second order economising as the firm attempting to economise transaction cost under the conditions imposed by levels one and two. Finally, in level four, namely third stage economising, the firm will attempt to optimise the neo-classical type input-output production function under the constraints imposed by levels one to three (Williamson, 2000). This approach would suggest that the performance of the firm is a function of history, prevailing institutional structures, its governance form and the management of the input-output function. Under the assumptions of this four level schema, therefore, the organisation structure and input-

output function of the firm may not be optimal, but, given the circumstances, it cannot be more efficient (Williamson, 2000).

Table 3.4 Schema of Theories of the Firm.

Level 1. Social Theory: 100-1000 years →	Level 2 Economics of Property: 10-100 years →	Level 3 Transaction Cost Theory: 1-10 years →	Level 4: Neo-classical Theory: Continuous
Customs	Formal rules of Game	Play of Game	Resource Allocation
Traditions	Property Rights	Contract	Prices, quantities
Norms	Judiciary	Organisation Structure	Incentive Alignment
Religion	Bureaucracy **1st order economising**	TCE economics **2nd order economising**	Optimisation **3rd order economising**

Organisational economics has, largely, accepted many of the tenets of social and positive political theory. Organisational economics, moreover, does not assume that any individual theory of the firm provides a comprehensive explanation of the emergence, size, boundaries and dynamics of the firm. The individual theories of the firm contribute inclusive variables that, in many instances, are simultaneously included-accepted in alternate theories (Groenewegen, 1996; Pitelis, 1996). Behaviour, largely ignored in neo-classical theory that assumes hyper-rationality, has been a central argument in shaping transaction cost theory, principal-agent theory, property rights theory and strategic management theory. Human beings are considered to be prone to opportunism and, because of information asymmetries, to act in a boundedly rational manner. Their behaviour is assumed to be influenced by self interest, peer pressure, corporate culture, trust and power (Foss, 1995; Akerlof. 1996; Dietrich, 1996; Pitelis, 1996; North, 1997; Zylbersztajn & Farina, 1999; Dean, 2000a; Brickley et al, 2001). The concentration of industries, the barriers of entry to new firms, the lobbying power of the firm, the impact of regulation and the bureaucracy costs of the state are also assumed in various theories of the firm. In this respect, the evolution of structures, competencies, the level of competition and competitive advantage are developed by both evolution theory, game theory, agency theory and strategic management theory (Mahoney, 1992; Mahoney and Pandian, 1992; Rowlinson, 1997.

Although not specific to every industry, the transaction costs of certain firms are also influenced by the natural resources and certain exogenous physical variables (PHY)

that are not specifically incorporated in the assumptions of the Williamson (2000) model. These variables include geological, climatic and biological factors (Delgado, 1999; Rouse & Putterill, 2000).

3.5 The Extended Transaction Cost Function

On the basis of the explanation of Williamson (2000) the transaction cost function can therefore be expanded as follows:

$$TC = f(BEH, BARR, EQU, REG, ME, PHY)$$

Where TC = transaction cost, BEH = human behaviour, BARR = the historic concentration of industry-infrastructure, EQU = equity versus economic objectives of the players in industry, REG = government and international regulation, ME = macro-economic influences and PHY = physical variables like climate, soil, geology.

3.6 Summary and Conclusion

The chapter employed transaction cost theory to explain why organisation structure is a function of the transaction characteristics of the firm. The chapter also employed a multiple theory of the firm approach, suggested by Williamson (2000), to explain how variables in the prevailing institutional framework influence the transaction characteristics of the unit level firm. Furthermore, this chapter has complemented Chapter Two which demonstrated that one of the principal reasons for an increase in contracting was as a result of the need to reduce transaction cost. The economic theory of this chapter will provide the theoretical basis to construct a conceptual framework in Chapter Four.

4.1 Introduction

The objective of this chapter is to develop a unique conceptual framework that contributes to the operationalisation of transaction cost theory. More specifically, the objective of this chapter is to develop a conceptual framework that can be applied to the analysis of transaction characteristics in a case study application.

4.2 Outline of the Conceptual Framework: Organisation Structure

The conceptual framework is developed as follows. Firstly, the actual contract and transaction characteristics of the case study are identified and classified before the level of intensity is graded on a five point basis so that each level can be accommodated in one of the five governance forms of the Petersen-Wysocki (1997;1998) vertical co-ordination continuum. Secondly, a conceptual framework, based on transaction cost theory, is constructed in the form of a table that matches each level of every transaction and contract characteristic with a theoretically optimum governance form. Finally, the actual contract and transaction characteristics are plotted in the table on the basis of matching their level of intensity with the most suitable governance form. A qualitative argument is then employed to discuss the suitability of the suggested optimum governance structure and the overall weighting of the consolidated actual transaction-cost characteristics.

4.2.1 Grading the Actual Contract-transaction Characteristics

The actual transaction and contract characteristics are identified in the historical records of the case studies. The transaction characteristics data are largely located in the agribusiness records of the accounting and processing divisions, or by way of personal interviews. The transaction characteristics of an agricultural supply chain include the frequency of transactions, the degree of asset specificity that is linked to the transactions and the level of uncertainty surrounding the transactions. The level of intensity of each transaction characteristic can be subjectively graded in terms of five levels. A very low level of transaction frequency (Grade 1), for instance, could be

allocated to a once off transaction, whilst high levels of daily deliveries could be classified at the Grade 4 or 5 level. Similarly, the level of the transaction characteristics of asset specificity and uncertainty can be subjectively graded from Grade 1 to Grade 5.

Table 4.1 The Grading of Actual Contract-Transaction Characteristics

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
b)Transaction Characteristics	Low	Higher	Medium	High	Very High
Frequency					XX
Asset Specificity					XX
Uncertainty		XX			
c)Contract Characteristics					
Level of Control					XX
Ability to walk away					XX
Substitutes					XX
Parties have own identity					XX
Duration					XX
Ex ante control					XX
Ex Post Importance					XX
Information Shared			XX		
Enforcement			XX		

It is proposed, for the purposes of the case study applications, that the level of frequency can be determined by the frequency of raw commodity deliveries. The asset specificity can be determined by the current cost of processing plant, as well as the co-ordination requirements of the raw commodity and the level of uncertainty can be deduced by way of analysing the past-future conditions of supply. The actual contract conditions that co-ordinate the respective activities of the case study application are also identified in the historical records of the case studies. The actual contract conditions are identified in terms of the ability of the parties to walk away from the contract, the level of available substitutes, whether or not the parties have their own identity, the duration of the contract and the level of ex ante control. Other conditions that need to be identified include the level of ex post importance, the level of shared information and how contract enforcement is achieved.. In each instance the contract characteristic is subjectively graded in the same way as the transaction characteristics. For instance, the duration of the contract could be very short (Grade 1), medium to long term (Levels 2-4), or very long (Grade 5).

For purposes of illustration, the actual transaction-contract characteristics (**XX**) of a hypothetical supply chain have been plotted in the table. The hypothetical graded

transaction characteristics (**XX**) suggest high levels of frequency (5) and asset specificity (5) and a low to intermediate level of uncertainty (2). Similarly, the hypothetically graded contract conditions (**XX**) suggest high levels of information (5) are shared over a long duration (5), that no substitutes exist (5), the parties to the contract cannot walk away (5) and that the parties do not have their own identity (5).

4.2.2 The Selection of the Optimum Governance Structure

The matching of transaction-contract characteristics with the most suitable governance form is illustrated in Table 4.2. Firstly, this study proposes that the actual transaction (b) and contract (c) characteristics are classified and graded as suggested in section 4.2.1.

Table 4.2 : Matching Transaction Characteristics with the Level of Managed Control

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Vertical Co-ordination Continuum	**Spot Market**	**Specification Contracting**	**Strategic Alliance**	**Formal Co-operation**	**Full Vertical Integration**
a) Actual Structure					XX
b)Transaction Characteristics					
Frequency	Low	Higher	Medium	High	Very High XX
Asset Specificity	Low	Higher	Medium	High	Very High XX
Uncertainty	Low	Higher XX	Medium	High	Very High
c)Contract Characteristics					
Level of Control	Low/external	Higher/external	Complex/ mutual	Hierarchy/ internal	Hierarchy / internal XX
Ability to walk away	High	Less	Less	Low	No ability XX
Substitutes	Yes	Lower level	Less	No	No XX
Parties have own identity	Yes / Independent	Yes	Yes	No	No / integrated XX
Duration	Short	Longer	Long	Long	Long XX
Ex ante control	High	Lower	No	No	No XX
Ex Post Importance	Low	High	High	High	High XX
Information Shared	Low	Higher	High XX	High	Extensive
Enforcement	Legal		More complex XX	Hierarchy	Hierarchy

* Based on: Williamson (1975; 1981; 1986); Mahoney,(1992); Petersen & Wysocki (1997; 1998) Sartorius and Kirsten (2002).

Transaction cost theory is then employed to match each of the actual graded transaction-contract characteristics (b & c) with the most suitable governance form in the table. A very high level of transaction frequency (5), for instance, would be located in the column that indicates full vertical integration. A summary of the plotted transaction and contract characteristics in the table is then employed to discuss the suitability of a single governance form to co-ordinate the required activities. The actual governance form (a), should one exist, is then also plotted on the vertical co-ordination continuum and compared to the optimum structure suggested by the actual transaction (b) and contract (c) characteristics. Finally, a qualitative argument is developed in order to demonstrate that the actual transaction-contract characteristics of the selected supply chain have influenced the actual chosen governance form. The grading and matching of transaction and contract characteristics with an optimum structure, as demonstrated in this section, expands the operationalisation techniques developed by Williamson (1975; 1981; 1986; 1988), Mahoney (1992) and Petersen and Wysocki (1997; 1998).

4.2.3 Case Study Application

The operationalisation technique developed in the previous section is now applied to a hypothetical case study application . The hypothetical actual governance structure (a) employed in the case study application, as well as the hypothetical actual transaction-contract conditions (**XX**) are plotted in Table 4.2**.** The actual governance form (a) employed indicates that the hypothetical supply of the raw commodity is co-ordinated by a fully vertically integrated governance structure as indicated. The actual transaction characteristics (b) and contract conditions (c) largely support this choice of governance form. The actual transaction characteristics (b) indicate high levels of frequency and asset specificity (5) and low-intermediate levels of uncertainty (2). These characteristics would need to be co-ordinated in a structure that tends more towards a relational type of contracting situation that, in turn, would be supported by a governance structure that leans towards full vertical integration. In further support, the hypothetical actual contract conditions (c) confirm the structure suggested by the transaction characteristics. The contract conditions suggest high levels of managed control (5), the inability of the parties to walk away from the contract (5), the unavailability of substitutes (5), the lack of identity of the parties (5) and a long

duration (5). The contract conditions have mostly been graded as (5) suggesting the need for a relational type of contract, which, again, is best accommodated in a structure that demonstrates high levels of vertical integration. The actual choice of structure (a) does not contradict the optimum structure and appears, therefore, to have been influenced by the actual transaction characteristics.

4.3 A Framework to Estimate the Impact of the Prevailing Institutional Environment on Case Study Level Transaction Cost

Williamson (2000) suggests that the prevailing institutional environment will determine the property rights economics of a society and that transaction cost can only be minimised within these constraints. Social and positive political theory largely explain the structure of the prevailing institutional environment as a function of the culture, norms and traditions of society, combined with the effect of the historic concentration of industry-infrastructure, a range of macro-economic influences, the natural resources and the political environment (North, 1997; Williamson, 2000).

This section attempts to develop a framework that can debate how the prevailing institutional framework has influenced the transaction costs of a case study application. The purpose of developing this framework is to demonstrate to agribusiness management that an understanding of the economics of transaction characteristics can provide an incremental approach to the design and cost management of supply chains.

4.3.1 The Extended Transaction Cost Function

Williamson (2000) suggests that the transaction cost of the firm is constrained by social-historical variables in the prevailing institutional framework. The economics of transaction cost, as developed in Chapter Three, suggests that the transaction cost function can be expanded as follows:

$$TC = f(BEH, BARR, EQU, REG, ME, PHY)$$

Where TC = transaction cost, BEH = human behaviour, BARR = the historic concentration of industry-infrastructure, EQU = equity versus economic objectives of the players in industry, REG = government and international regulation, ME = macro-economic influences and PHY = physical variables like climate, soil, geology

The case study application is developed as follows. Firstly, the case study application is analysed in order to identify industry specific socio-historical variables in the prevailing institutional environment. Secondly, a qualitative argument is used to link specific variables in the prevailing institutional framework to industry level transaction costs at the case study level.

The historical records of the case studies and their respective industries are used as the basis for gathering the required data. Data collected include the behavioural aspects of society, patterns of industry concentration, information covering regulation-property rights economics and the extent of macro-economic influences. Williamson (2000) suggests that social and positive political theory, largely, explains how human behaviour (BEH) is shaped by the historical legacies of its societies, as well as the patterns and location of development of industry and infrastructure (CONC). In addition, the equity objectives (EQU) of shareholders, government and society are explained by the need to balance equity versus economic objectives (Drury, 1996). Finally, long term macro-economic influences (ME) including inflation, the cost of energy, interest rates, exchange rates and monetary and fiscal policy are the product of the long term influence of government and a wide range of complex domestic and international forces (North, 1997; Rowlinson, 1997).

4.3.2 Transaction Cost and the Prevailing Institutional Environment

Williamson (2000) proposes that the influence of variables in the prevailing institutional environment can be traced to transaction cost at the industry-firm level. Human Behaviour (BEH), for instance, influences principal-agent relations, work ethics and a range of transaction costs relating to supervision, training, education and absenteeism (Rowlinson, 1997). Human behaviour, in turn, is influenced by the long term history of a society (North, 1997). Transaction costs, at case study level, are also influenced by the historic concentration of industry (CONC), infrastructure,

communication and services. The historic concentration of industry, for instance, has often monopolised scarce resources increasing the cost of entry to new players. Firms outside developed areas are often penalised with higher levels of transaction cost relating to the cost of inputs and transport (Porter, 1986).

The historic equity objectives of society (EQU), government, shareholders and industry are often reflected in the transaction cost of the firm. Agribusiness in South Africa, for instance, has established long term social programs, facilities and services for employees and local communities that are reflected in the transaction costs of the company. The prevailing property rights (REG) economics of a society influences a wide range of transaction cost at firm level, including contracting costs for inputs and contract enforcement economics. Finally, long term macro-economic forces (ME) that influence the transaction cost of industry, in general, can be traced to the unit firm. These forces include inflation, the cost of energy, exchange rates and the effect of long term monetary and fiscal policy.

4.3.3 A Case Study Application

For illustrative purposes, a case study application in the Southern African agricultural sector is hypothesised. The influence of human behaviour, the historic patterns of development, the equity objectives of society, macro-economic forces and property rights economics are traced to transaction cost in Table 4.3. Human behaviour (BEH) in Southern Africa, for instance, has been profoundly influenced by a plethora of historical legacies of the country including colonialism and apartheid. Human behaviour including culture and work ethics have affected a wide range of principal-agent costs in the agricultural sector including supervision cost, uncertainty, moral hazard, training costs and absenteeism. In particular, the farm sector is faced with increasing demands by organised labour to redress past principal-agent practices. The historic patterns of agricultural development (CONC), moreover, tended to concentrate in rich natural resources areas. The sugar and timber industries, for instance, concentrated in the higher rainfall areas of Kwazulu-Natal, Mpumalanga and the Eastern Cape. These industries were funded by government, international donors and private enterprise and localised development of infrastructure, communication and facilities was structured accordingly. Currently, new entrants are confronted by

high levels of entry cost as a result of a quasi monopoly situation, the marginal nature of new areas, high transport costs, a lack of infrastructure and the high cost of plant and equipment.

Table 4.3 Transaction Cost and the Prevailing Institutional Framework

The Prevailing Institutional Environment →	Transaction Cost
1. Human Behaviour (BEH) influenced by historical legacies (eg impact of colonialism, apartheid on human behaviour) →	1. Transaction cost affected by culture, norms, work ethics that influence principal-agent cost including uncertainty, moral hazard, supervision cost, training costs, education, absenteeism
2. Equity-social objectives (EQU) of government, development aid bodies (eg Commonwealth Development Corporation, Industrial Development Corporation, World Bank, South African Government) →	2. Transaction cost of new entrants influenced. Transaction costs of current players include high levels of social responsibility (eg agribusiness investment in schools, hospitals, communication and education)
3. Evolutionary Establishment of industry (CONC) Creates Barriers of entry and Patterns of ownership. National-local government bureaucracy cost →	3. Influences start-up cost for new entrants. Cost of facilities-infrastructure for new entrants. Asset specificity concentrated. Monopoly advantages accrue to first movers. Transaction cost-time re authorisation, procedures, efficiency, political
4. Macro-economic forces, inflation, exchange rates, economic cycles (ME) →	4. Cost of financing, import-export economics, cost of inputs.
5. Government Regulation (REG) →	5. Cost of power, water, tax, labour. Economics of property rights.

Past equity objectives (EQU) of government, development bodies like the Commonwealth Development Corporation and the World Bank have influenced the transaction cost of many agricultural sectors. Transaction cost has been influenced by the need to provide medical, educational and recreational facilities for company employees and their related communities. The sugar industry in Southern Africa, in certain instances, has created villages, medical facilities and schools. The current transaction costs of labour has, therefore, been profoundly influenced by historic equity legacies. Historic regulation with respect to property rights, labour and power continues to influence the transaction cost in the agricultural sector. Regulation influencing land rights, gender issues, the role of tribal authorities and the structure and power of local authorities, continues to influence the current transaction cost of contracting in agriculture. Finally, decades of macro-economic forces like inflation, the cost of oil, monetary and fiscal policy, economic cycles of growth and depression and the influence of disease (AIDS) currently influence the transaction cost of South African agriculture.

4.4 Summary and Conclusion

The conceptual framework developed in this chapter has been developed to analyse and select the optimum governance structure in a case study application, as well as to provide agribusiness management with an alternative approach to control transaction cost. The proposed framework, that includes the practical quantification and matching of transaction characteristics, organisation structure and contract conditions, is proposed as a unique contribution to the operationalisation of transaction cost theory in an agricultural context. This chapter also proposes that transaction cost can only be minimised against the backdrop of the prevailing property rights economics and institutional environment. The pervasive and long term affect of these variables suggests that agribusiness management can investigate the possibility of economising some of these costs, in conjunction with searching for the best match between the firm's transaction characteristics and governance structure. This study readily acknowledges the problem of quantifying differential sets of transaction cost, as a result of the influence of the prevailing institutional framework. Despite these limitations, the determination of variables that influence transaction cost, allows management to tackle cost reduction on a far broader canvas than the limitations of the firm level input-output function. A knowledge, moreover, of exogenous variables influencing incremental transaction cost, can be directed to industry level lobbying for more favourable policy, property rights regulation and political economy gains.

This chapter provides the case studies in Chapter Five and Six with a framework-methodology to analyse the suitability of their governance structures, as well as a tool to evaluate the causality of transaction cost. This framework is also incorporated in the design of the proposed contracting model in Chapter Seven.

Chapter Five: Case Studies in the South African and Swaziland Sugar Industries

5.1 Introduction

The objective of this chapter is to test the research questions stated in Chapter One, by using a case study in the Southern African sugar industry. A further objective of this chapter is to incorporate the results of this chapter in the design of small-holder contracting models. The conceptual framework, developed in Chapter Four, contributes to the selection, assembly and analysis of the data. The case study combines a sugar producer in Swaziland, namely Mhlume Sugar Company (MSCo) and the Transvaal Sugar Company (TSB) situated in Mpumalanga, South Africa. The MSCo company is located in the north-east of Swaziland approximately ten kilometres south of the South African border. It is bordered by the Lebombo mountains to the east and the Komati river to the west. By contrast, the Transvaal Sugar Company (TSB) is located in South Africa in the province of Mpumalanga. The factory operation consists of two sugar mills. The first mill is located at Malelane, south of the Crocodile river and the second mill south of Komatipoort. Figures 5.1 and 5.2 illustrate the location and layout of the two sugar producing operations.

Figure 5.1 The MSCo Sugarcane Supply Operation

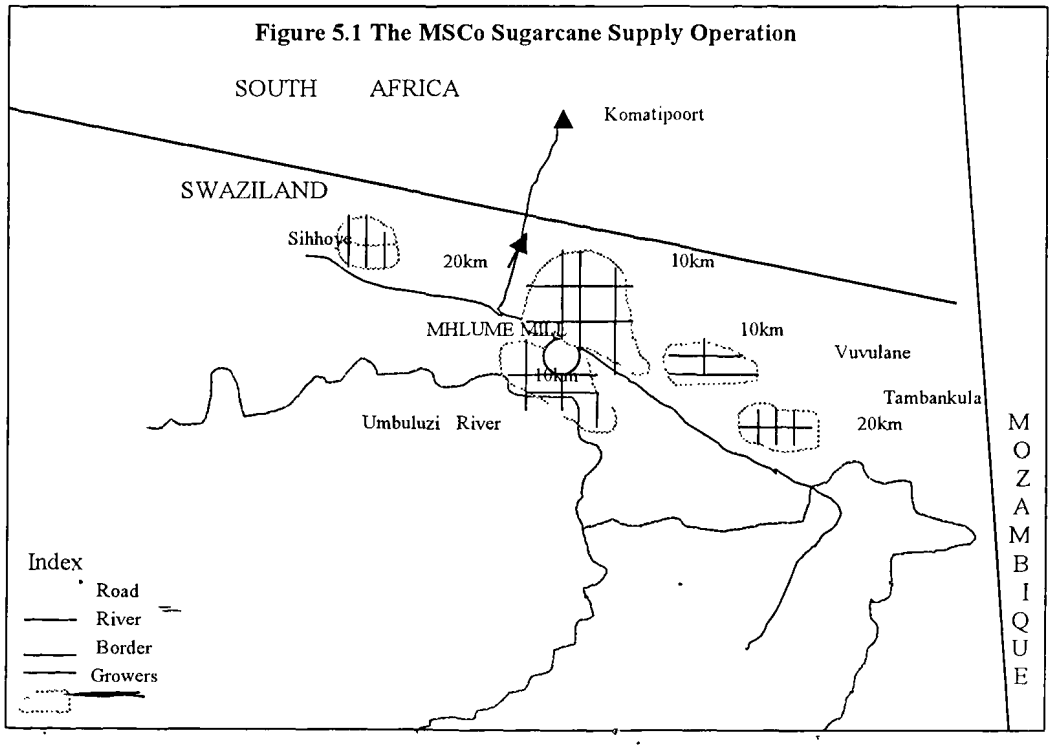
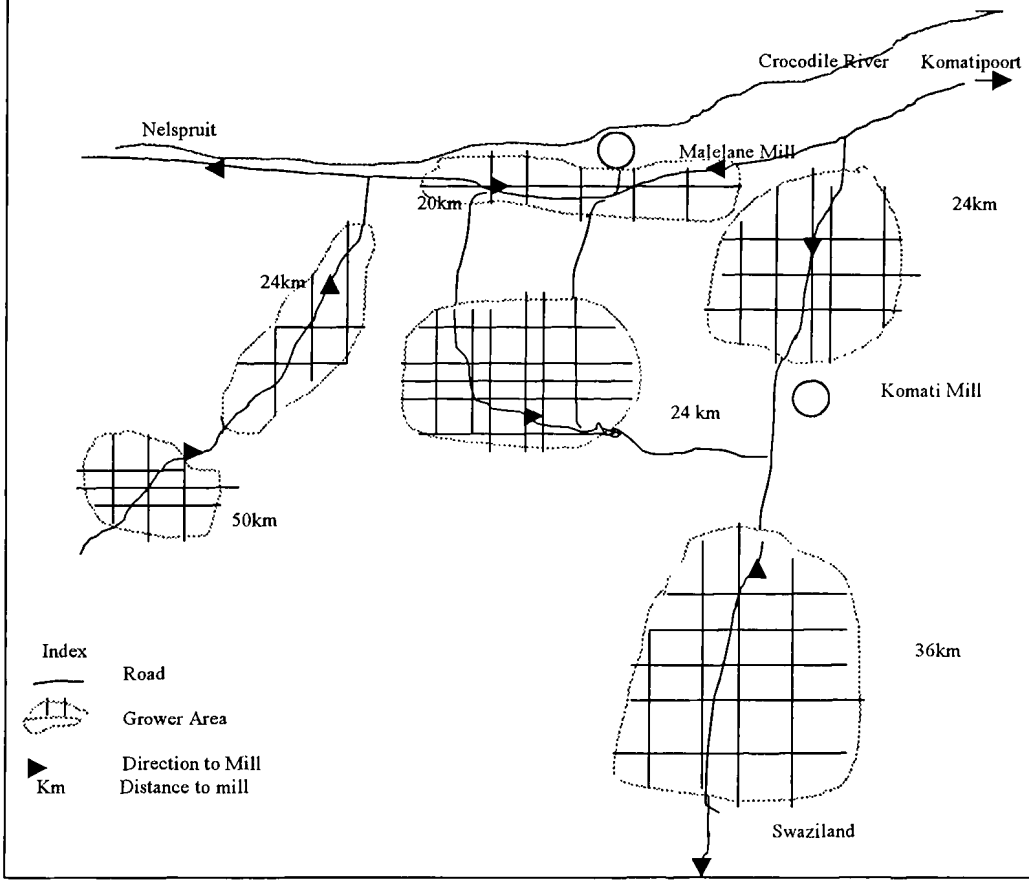


Figure 5.2 TSB Grower-Processor Supply Chain



The chapter commences with a description of the background and institutions that have influenced the sugar industry in Southern Africa. This description emphasises some of the historical legacies and the macro-environment that have shaped the sugar industry. The two companies are then introduced including the data, history, performance, logistics and economics of the two sugarcane supply-processing operations. The five research questions are separately examined and tested before a summary and conclusion are developed.

5.2 Background (Courtesy of the Swaziland Sugar Association and Mhlume Sugar Company)

5.2.1 The Swaziland Sugar Industry

The Swaziland Sugar Industry is regulated by the Sugar Act of 1967. Under this Act, the control of the industry is vested in the Swaziland Sugar Association (SSA), with production controlled by a quota system. The SSA owns certain assets, like warehousing, and also markets all the sugar produced in Swaziland. The SSA has two members, the Swaziland Cane Growers Association (SCGA) and the Swaziland Millers Association (SSMA). These members have an equal number of votes in the SSA council and collectively control the sugar industry. The sugarcane growing industry is a major player in the Swaziland economy accounting for 60 % of the agricultural gross domestic product and 12 % of the total gross domestic product Furthermore, the sugar production contributes 25% of the manufacturing sector in Swaziland and, in total, including both growers and millers, accounts for 20% of the total gross domestic product. The sugar industry generated between 11.1% and 17.5% of total export earnings between 1996 and 1999 and employs in excess of 20 000 people, illustrating its importance in the Swaziland economy.

5.2.2 The South African Sugar Industry

The South African sugar industry is regulated by the Sugar Act (1978), which grants statutory powers of self government to this sector of the economy. The affairs of the sugar industry are controlled by the South African Sugar Association (SASA) who administer the production and supply of sugar cane to the millers, in addition to the production, marketing and distribution of sugar. SASA is made up by the SA Cane Growers Association (SACA) and the South African Sugar Millers Association (SAMA) who are equal partners and each elect eleven councillors to sit on the governing body.

The South African sugar industry produces an average of 2.5 million tons of sugar per season, of which 50% is exported. These exports contributed R 1.9 billion to the country's foreign exchange earnings in 2000/1. The sugar growing areas of South Africa primarily include Kwazulu-Natal, Mpumulanga and the Eastern Cape, where

the climatic conditions are more favourable for the growing of sugarcane. In 2000/1 the sugarcane industry directly employed 85 000 workers and indirectly an additional 265 000 people in other related industries. The number of growers and area under sugar cane are illustrated in Table 5.1

Table 5.1: Area and Number of Sugar Growers

	1999/2000		1999/2000		2000/1		2000/1	
Growers	Numbers	%	Area (ha)	%	Numbers	%	Area (ha)	%
Small Scale	51 439	96.7	82 831	19.6	50 561	96.6	83 482	19.6
Large Scale	1744	3.3	338 806	80.4	1799	3.4	343 116	80.4
Total	53 183	100.0	421 637	100.0	52 360	100.0	426 598	100.0

5.2.3 The Sugar Markets

The Swaziland sugar industry sells to five main markets. These are the European Union (EU), the United States (US), the Southern African Customs Union (SACU). the Local Region (principally Mozambique), and the world market. Swaziland benefits from preferential access to the European Union market as a result of the Cotonou Agreement and receives a special variable annual tariff quota for this category of sales. Swaziland also has preferential access to the United States market for a variable quota with a fixed minimum annual quantity. Sales to SACU mostly include South Africa and the local Swaziland market and are subject to the joint price regulations imposed by the South African Sugar Association and the Swaziland Sugar Association respectively. Both South Africa and Swaziland are bound by a sugar agreement to regulate the industry in Southern Africa (SADC). The other countries include Malawi, Zambia, Zimbabwe, Mozambique, Tanzania and Namibia and. collectively, this agreement regulates sales to the world market and to SACU. Sales to the world market are only concluded once Swaziland has fulfilled its quota allocations to the European Union, the United States and SACU. In the period 1999/2000. Swaziland sold 526 046 tons of sugar of which 31 % was sold to the EU, 3 % to the US, 48 % to SACU and 18 % on World regional and overseas markets

The export of sugar from South Africa has increased steadily from 1996/7 to 2000/1 where exports made up more than 50% of total disposals. Exports from South Africa include markets in Africa, the Middle East, North America and Asia. The disposal of sugar occurs in two principal markets, the South African Customs Union (SACU) and the world sugar market. South Africa is a party to a regional co-operation agreement

to facilitate the optimal development of the sugar industry in Southern Africa. South African sales to SACU have recently increased due to Swaziland's inability to supply its quota, whilst the decline of the Rand against the dollar, combined with a recovery in world sugar prices, contributed to a 25% increase in export revenue in 2000/1.

5.2.4 Industry Competitiveness

The irrigated sugar industry in Southern Africa is highly competitive with both regional and international players. Between 1995 and 2000, Swaziland growers produced a yield per hectare of between 95 and 100 metric tons with an average sucrose content of 14 %. By comparison the irrigated sugar industry in South Africa produced a yield of 98 metric tons per hectare with an average sucrose yield of 13.8 %. This level of productivity compares well with the irrigated cane sectors in Southern Africa where Zimbabwe, historically (at least until 2001), produced a yield of 115 metric tons per hectare and a sucrose yield of 14%, whilst Malawi has produced a yield of 95 metric tons per hectare and a sucrose yield of 14%.

Swaziland sugar production, including factory performance and recovery rates, ranks amongst the most efficient in the world, including Columbia and Australia. South Africa's production cost per metric ton of sugar is somewhat higher than many regional and international competitors. In this respect, South Africa produces sugar at a cost of US $ 350 per metric ton, compared to Malawi at US $ 200, Zambia US $220, Zimbabwe US $ 220 Australia US $ 245, Swaziland US $ 250, Kenya US $ 270, Ethiopia US $ 300 and India $ 330. The South African sugar milling sector, however, ranks amongst the most efficient in the world, where the factory performance in terms of recovery rate has been around 97% for the period 1995-2001. South Africa's transport costs per ton (US $ 10) are also the lowest in Southern Africa compared to Swaziland (US $ 30 per metric ton), Zimbabwe (US $ 40) and Malawi (US $ 70). Swaziland's transport costs, however, remain high in relation to South Africa but compare favourably to Zimbabwe at US $ 40 (historical cost) and Malawi at US $ 70. Finally, the long-term deterioration in the real exchange rate of the South African Rand has also provided the industry with an added competitive export advantage.

5.3 The Companies

The two agribusiness companies consist of the Mhlume Sugar Company in Swaziland and the Transvaal Sugar Company in Mpumalanga, South Africa.

5.3.1 The Mhlume (Swaziland) Sugar Company

The Mhlume (Swaziland) Sugar Company (MSCo) was founded in 1958 and is fifty percent owned by the Commonwealth Development Corporation and fifty percent by the Swaziland Nation, in the form of the institution, Ingwenyana. MSCo produces a number of sugar products including raw brown sugar, refined sugar and molasses. The company currently employs in the order of 1865 permanent staff and contracted 314 seasonal staff in 2000/1. Permanent staff have remained relatively constant over an eighteen year period from 1983/4. The company has achieved an average return on capital employed (ROCE) of 82% between 1986/87 and 2000/1. The ROCE climbed relatively steadily from 52% in 1986/87 to a peak of 147 % in 1996/7. Thereafter, ROCE has declined to the current level of 88 %. ROCE calculations have all been adjusted by the inflation index to 1992/3. Turnover has increased from R 45 million in 1981/2 to R 351 million in 2000/1 and profit before interest and tax (PBIT) from R 6.8 million in 1981/2 to R 107.8 million in 2000/1.

The mill operations generate larger profits than the agricultural division and the ratio between the mill and the agricultural operating margins is approximately 2:1. In the same period capital employed has increased from R 36.3 million to R 122.6 million, whilst cash on hand has declined from an overdraft of R 4.3 million to an overdraft of R 20.4 million. The factory performance indicates that the mill operations processed an average annual tonnage of 1.25 million tons between 1982/3 to 2000/1 with a minimum tonnage of 1.07 million tons in 1985/6 and a maximum of 1.37 million tons in 1986/7. These operations have yielded a minimum of 131 000 tons of sucrose in 1985/6 and a maximum of 193 000 tons in 1991/2. Plant utilisation has increased from 83 % in 1981/2 to 95% in 2000/1 but, in this period, has ranged between 74% and 97 %. Finally, MSCo increased mill capacity by 12 % in the period 1990 to 2001.

5.3.2 The Transvaal Sugar Company

Transvaal Sugar Limited (TSB) was founded in 1965 and operates in the province of Mpumalanga with offices in Johannesburg and Durban. TSB is a 100% owned subsidiary of Hunt Leuchars and Hepburn (HL & H) which, in turn, forms part of the Rembrandt Group of companies. TSB has five divisions that report directly to the managing director. They are Finance, Sugarcane, Citrus, Human Resources and the Malelane and Komati Mills. The company's main activity is the production of sugar, however, the company is also involved in the cultivation of citrus, subtropical fruit and tea. Apart from the production of these products, the company produces a range of products like animal feed from the by-products of sugar cane. TSB employs 4000 people and contributes substantially to the economy of Mpumalanga. The company has the capacity to produce 350 000 metric tons of sugar annually from its two factories near Malelane and Komatipoort. The sugar is sold under the Selati brand name. Sugar production has increased from 109 500 metric tons in 1975/76 to the current level of approximately 300 000 metric tons in 2000/1. Total tons of cane crushed in the same period have increased from 1 million tons to 2.5 million tons. Sugar production contributes towards 83 % of TSB turnover, followed by animal feed (8%), tea (3%), transport (3%), citrus (2%) and litchis (1%). Assets employed have increased from R 80.5 million in 1986 to R 586 million in 1995 and the current estimated replacement value of total company assets is R 2.3 billion.

5.3.3 The Data

The data consists of the historical records of the Mhlume Sugar Company (MSCo) of Swaziland and the Transvaal Sugar Company in Mpumalanga. The MSCo case study data includes two sets of data from small-scale farmer associations that are contracted to the company to supply sugarcane, namely, the Nyakafto Farmers Association, Swaziland and the Vuvulane Farmers Association, Swaziland. The data from these organisations consists primarily of the historical records of the MSCo company and its contracted growers between 1981 and 2001. Although the data are largely of a qualitative nature some quantitative data have been developed. This data includes a questionnaire survey of satisfaction level of small-scale growers supplying sugarcane

to the MSCo mill. The MSCo data is located at the company operation in Mhlume, Swaziland. The TSB data consist of the historical records of the company located at the head office, namely Transvaal Sugar Company (TSB), Malelane, South Africa. In addition a sample of small-scale cost data were developed by the TSB company (Madadeni Project 1998-2001) and the South African Cane-growers Association (SACA), Kwazulu-Natal, South Africa (Figtree Project 1996-2001). The selection of data in the case studies has been largely guided by Chapters Two and Three. The data were collected on a number of field trips between June and December 2001. The limitations of the data are primarily the incomplete nature of the financial records of the small-scale farmer associations with respect to the overhead cost structure, in addition to the non standard treatment of development costs. Furthermore, the South African Cane Growers Association has omitted certain overhead expenditure like depreciation. In order to assess and compare the records of the company versus the small-scale farmer associations, estimates have been established in line with general accounting practices. The financial records of small-scale grower associations have been adjusted to exclude both interest received and paid, in order to compare their performance with the agribusiness companies. The limitations of the data also include the arbitrary apportionment of TSB company overheads to the company estates. The cost data for the agricultural division, in this respect, includes overhead costs that relate to the production of other crop types like citrus and litchis. Because these additional crops represent less than 4% of total production cost, the original total overhead cost structure has been maintained. The overhead cost of the TSB agricultural division has thus been marginally overstated. Finally, the researcher obtained permission to access the respective data of the two companies and the completed case study has been reviewed by the management of both the MSCo and TSB companies.

5.4 The Growers

A summary of the cane growers in the two case studies is illustrated in Table 5.2. The major categories of grower include the company estates, contracted small-scale farmers and contracted medium to large growers. Whilst the MSCo estates currently grow 67 % of sugarcane processed and contracted growers 33 %, the TSB estates produce only 18 % of sugarcane deliveries to its mills with 82 % supplied by

contracted farmers. In both instances, contracted small-holders operating as farmers associations or managed small-holder schemes, supply 18 % of sugarcane

Table 5.2: Sugarcane Production for 1999-2000

Growers	MSCo		TSB	
	Area Ha	%	Area Ha	%
Company Estate	8791	67	7932	18
Contract Small	2329	18	7473	18
Contract Large	2042	15	27605	64
Total	13162	100	43010	100

5.4.1 The Supplier Contract

The contrasting contract conditions of the two companies are listed in Table 5.3. All contracted growers who supply the Mhlume Sugar Company, except for the agricultural division of the company, are required to sign an annual supplier agreement with the company. All new applicants must conform with a list of requirements to obtain a sugar quota from the Swaziland Sugar Association and the Mhlume Mill Group. Firstly, the applicants need to ensure that they have the legal status to act as suppliers. The applicant is required to provide proof of being a registered supplier and, in the case of growers operating on traditional land, a letter of authority is required from the tribal authority with respect to the use of the land. Alternatively, growers need to supply proof of permanent land tenure rights. Furthermore, the applicant is required to provide proof of water rights, as well as details of the geographical location of the farm and the respective soil conditions as identified by a Swazi Sugar Association agronomist. The application for a sugar quota requires a letter indicating the mill group's agreement to accept him/her as a supplier. On receipt of the sugar quota, the new supplier becomes a member of the Swaziland Growers Association and becomes eligible to enter into an annual supply agreement with the company. At the start of each season, the company mill group committee secretary will issue each grower with a new mandate form for the year. The grower will fill in the form giving all the required information such as the date, address and the daily tonnage that can be supplied. These forms must be signed before the first mill group meeting of each season at which all the grower must provide estimates of their total tonnage for the season. The supplier thus undertakes to deliver a fixed daily tonnage of cane to the mill. This quota is strictly enforced by the mill which allows a daily tolerance of 5% above or below the estimated daily

tonnage. These records become the official supply records and constitute the basis of the MSCo grower contract arrangement for the season.

Table 5.3: The Contract Conditions

Contract Conditions	MSCo	TSB
Contract	Annual Supply Agreement	Formal Contract
Contract Enforcement	Mutual interest, complex	Legal, Complex
Managed Control	Medium.	High.
Ability to Walk Away	Low but possible. Interlocking factors.	Limited. Long term contract. Interlocking conditions
Available Substitutes	None	None
Parties have own identity	Yes	Yes
Duration	One year	Many years
Ex ante control	Low	Low
Ex post importance	High	High
Information shared	High	High

The contractual arrangement between farmers and the Transvaal Sugar Company Limited (TSB) is controlled by a Cane Delivery Agreement. All growers must adhere to the conditions and obligations that are specified in a comprehensive specification contract that binds the respective parties over long periods of time. The contract contains twenty clauses that form the main body of the agreement, together with a series of appendices. The contract identifies the parties, together with a list of definitions in clauses one and two. Clause three outlines the interpretation of the contract, whilst clause four and five specify the basis of the agreement and the period of the contract. Clause six outlines the growers' obligations in a comprehensive fashion and allows the TSB company access to the property of the grower to assess the supply of extension services and to co-ordinate the delivery of cane to the company mill. The company, in turn, outlines its undertakings in clause seven and specifies how the contracted grower will be paid in clause eight. The price paid to out-growers is determined by the specifications of the South African Sugar Association, which determines the grower-miller split from the proceeds of sugar sales. Clauses nine to twelve cover transfers of areas, rights and amendments to the contract and clause thirteen stipulates the terms of the contract as a result of a *force majeure*. Clauses fourteen to seventeen outline the

conditions of termination, default, jurisdiction and arbitration respectively. Finally, clauses eighteen to twenty outline the procedure of notification, cession and miscellaneous issues.

The principal difference between the sugarcane supply contractual arrangements of the two companies is that TSB relies on a long term formal contract whereas MSCo employs a more informal annual agreement. TSB, therefore, relies more heavily on legal enforcement of the conditions than MSCo. MSCo, for instance simply does not renew the annual agreement if a contract farmer does not fulfil their obligations. Both companies, however, rely on interlocking factors to ensure contract enforcement. These factors include a lack of alternate opportunities, heavy social investment in the contracted suppliers and local communities, the development of trust and the administration of suppliers affairs combined with the role of facilitating loans and access to institutions.

5.4.2 Land Tenure

Swaziland still retains a dual structure of land tenure, dating back to the 1907 Land Act and Swazi nation land (SNL), operating under traditional land rights, has been allocated to the Swazis. Title Deed Land (TDL) in Swaziland was originally allocated to European owners on the basis of freehold title. Land has also been allocated on a long term lease basis to agribusiness in Swaziland. The land, allocated on an SNL basis, has risen from 39% in 1907 to almost 70 % by the mid 1980s (Levin, 1988; Atkins & Terry, 1995). Whilst MSCo, larger growers and the managed smallholder operation of Vuvulane operate on the basis of long term lease-freehold title, a majority of small-scale farmers operate on Swazi Nation Land where traditional land rights operate (Atkins & Terry, 1995).

South African land tenure arrangements are regulated by a number of acts and growers in the TSB supply chain farm under a number of conditions. TSB holds freehold title-long term lease facilities to the company estates, as do the majority of the contracted medium-large growers. The conversion of previously owned company estates to small-scale farmer operations has resulted in an increasing number of small-scale growers also obtaining freehold title to their land. The land tenure

arrangements of many small-scale farmers, however, are still defined by Proclamation R188 of 1969, that outlines the conditions pertaining to traditional or communal land. This proclamation bestows a range of rights and access to land. Land access is usually by virtue of membership to a community and not through sale, lease or rent. In many instances, traditional regulation only permits men to inherit land rights. Individuals, moreover, do not own their residential and arable allotments but, rather, are allowed the right of occupation and cultivation as stipulated by the tribal authorities. According to some surveys, approximately 15% of land in the former homelands is held on freehold or conditional title. African freehold rarely belongs to a single person but rather to the extended family or a syndicate. Several of the Native Lands Acts, however, that specifically segregated land on a racial basis and restricted Africans to certain types of land tenure, were set aside in the 1990's (Klug, 1996).

5.5 The economics of Sugarcane Supply

5.5.1 The Organisation Structure of the Sugarcane Supply Chain

The sugarcane producing areas in both case studies are, mostly, located within a thirty kilometre radius of the company mills. The growers' infrastructure include a network of secondary dirt and tar roads. The logistics of sugarcane supply are centrally controlled by the management of the company factories. The companies maintain records of the spatial and agronomic qualities of all the growers and a co-ordinated planting and harvesting schedule is developed on an annual basis by the factory sugarcane supply departments. The planting-harvesting schedule of the company estates is also developed and jointly co-ordinated by the agricultural and processing operations of the MSCo and TSB operations. The estimated planting-harvesting schedules form the basis of an annual supply contract that is co-ordinated by the factories. Both the company estates and the contracted growers are required to adhere to a pre-determined delivery schedule that stipulates the exact dates and quantities that must be delivered. The transport of sugarcane occurs in five to thirty ton loads. The company estates largely employ their own transport fleet, whilst contracted growers engage local transport companies for their haulage requirements. The supply of sugarcane to the company mill occurs in an annual thirty week cycle, that is extended if necessary to thirty six weeks, between December and July each year. The

harvesting-delivery schedule, developed and managed by the sugarcane supply department, ensures that the logistics of delivery extend to a twenty four hour cycle in the growing season. The trucks are queued in the cane supply yards after passing over the company weigh-bridges. The loaded trucks are offloaded by overhead cranes or tipped directly onto the cane crusher conveyer belts. The unloaded trucks are then re-weighed before exiting the company premises. Finally, the delivery quantities are captured on the daily delivery schedules that are the basis of ensuring capacity is maintained, as well as the basis for remunerating suppliers.

Farmers in both the case study areas produce sugarcane. A supplier contract controls part of the production and delivery of sugarcane and allows the MSCo and TSB management a measure of control over the growing operations of the contracted farmers. According to the method Petersen and Wysocki (1997; 1998) use to classify different governance forms, as described in Chapter Three, the level of managed control afforded by the contracts of the farmers could be described as the governance form of specification contracting. This structure falls to the left of the vertical co-ordination continuum in Table 5.4. In this type of governance structure the level of managed control is higher than the spot market, but lower than that of joint alliances, formal partnerships and full vertical integration. Conversely, the agricultural estates of both companies are fully vertically integrated into the company hierarchy. This governance form is found on the right hand of the same vertical co-ordination continuum and incorporates a structure that is 100 % controlled within the hierarchy of the company. The actual organisation structure of the two sugarcane supply operations therefore displays a combination of two types of governance structure.

Table 5.4 : Organisation structure: Sugarcane Supply

	Spot Market	Specification Contracting	Strategic Alliance	Formal Co-operation	Full Vertical Integration
Level of managed co-ordination	0%	Low	Intermediate	Int. high	High
Actual Governance Structure		1.MSCo Contract Growers 33 % 425 000 tons 2.TSB Contract Growers 82 % 3 114 000 tons			1. MSCo Company Estates 67 % 864 000 tons 2. TSB Company Estates 18 % 684 000 tons

Based on Chapter Three: Petersen and Wysocki (1997; 1998)

This combination of structures demonstrates that specification contracting is employed to procure 33 % and 82 % of sugarcane supply in the case of MSCo and TSB respectively, whilst full vertical integration (own estates) is employed to procure 67 % and 18 % respectively. The weighted structure of both companies would suggest that the MSCo Company has higher levels of managed control over sugarcane supply than the TSB Company.

5.5.2 Transaction Characteristics of Sugarcane Supply

The delivery and processing of large volumes of a perishable commodity requires the co-ordination of the activities of the growers to ensure the optimum use of high fixed cost processing facilities that are unique to the sugar industry. The volume of supply, the nature of the suppliers and the industry specific nature of the processing plant and equipment, in turn, influence the dynamics of the firm's transactions. The transaction characteristics of the cane supply operations are illustrated in Table 5.5. The conceptual framework, developed in Chapter Four, has been used to identify and classify the transaction characteristics of the respective supply chains. The annual number of sugarcane deliveries to the mill was used as a basis to determine the transaction characteristic of frequency, whilst the value and co-ordination requirements of company fixed assets were used as a basis to determine asset specificity. The transaction characteristic of uncertainty has been evaluated on the basis of a qualitative analysis of the conditions of supply.

Table 5.5 : Supply Chain Transaction Characteristics for 2000/1

	Mhlume Sugar Co (MSCo)	Transvaal Sugar Co (TSB)
	13162 Hectares	42268 Hectares
Transaction Characteridtics		
1. Frequency		
Tonnage Crushed	1 288 799 (1 mill)	3 800 000 (2 mills)
Number of Deliveries	52 350	136 000
Administration	582 tons/transaction	246 tons/transaction
2. Asset Specificity		
Co-ordination Level	Very High	Very High
Value of Estates	R 630 million	R 1 billion
Value of Plant	> R 2 billion	R 2 billion
3. Uncertainty		
Supply-Current	Low	Low-Intermediate
Supply-Projected	Low-Intermediate	Intermediate
Processing Costs	High Degree of leverage	High Degree of leverage

5.5.2.1 Transaction Frequency

The results suggest that the continuous nature of both processing operations, combined with the large volumes of sugarcane processed, influence high levels of transaction frequency. For the period 2000/1, thirty nine different supplier groups delivered 1.27 tons of sugarcane in 52 350 deliveries to the MSCo company mill. TSB displayed a similar high level of transaction frequency in the grower processor supply chain for the same period, where some 136 000 deliveries resulted in the supply of 3.8 million tons of cane to two separate mills. Both companies, moreover, generate a high number of administrative transactions with respect to the supply of sugarcane.

5.5.2.2 Asset Specificity

Asset specificity relates to the degree to which the assets of the processor or the grower are locked into sugar specific transactions. High levels of asset specificity for the processor exist in both of the grower-processor supply chains. The MSCo mill group employed some R 2 billion of fixed assets at current cost in 2001. Moreover, the level of fixed assets is projected to increase as a result of a R 200 million mill expansion program to accommodate the production of an additional 6 000 hectares of sugarcane from a new small-scale farm project that is due to come on line in 2002/3. Similarly, TSB factory assets have been valued at R 2.3 billion. In both instances, the assets of these companies are highly specific and have a low opportunity cost outside the sugar industry. The assets, moreover, are relatively immovable and are also site specific as they have been centralised in relation to the company estates and out-grower suppliers. Conversely, the assets of the contracted growers consist largely of irrigation and general farming equipment that can be applied relatively easily outside the sugar industry. The factory assets further demonstrate asset specificity as a result of the need for high levels of co-ordination in order to maximise the use of capacity. The delivery of sugarcane is co-ordinated by a delivery schedule that operates seven days a week on a twenty four hour basis over a 30-36 week harvesting cycle. Every supplier contracts to deliver a specified tonnage of cane every twenty-four hours on a five, six or seven day a week basis as specified by the annual agreement. The cane receiving yards of MSCo and TSB are, therefore, required to co-ordinate and process

the continuous delivery stream of a perishable product, involving 1. 29 million tons and 3.6 million tons respectively. The high levels of co-ordination are further influenced by the perishable nature of sugarcane that begins to lose sucrose content 48 hours after harvesting. Both the MSCo and TSB milling groups, therefore, display significantly higher levels of asset specificity than their contracted growers and higher levels of asset specificity than their own agricultural estates.

5.5.2.3 Uncertainty of Supply

Despite the high level of fixed cost of both of the processing operations, combined with a similar need to maintain mill capacity, the important issue of supply uncertainty appears to be different for the two companies. In the case of MSCo. supply uncertainty, historically, has been relatively low, due to the fact that the company estates have produced more than 60 % of the sugarcane processed (The company, however, is in the process of expanding smallholder supply). Further factors influencing lower levels of supply uncertainty are: Firstly, sugarcane has traditionally been considered as the best cash crop opportunity in Swaziland where few substitute opportunities exist. Secondly, Swaziland growers have received higher prices than their South African counterparts because of the preferential prices received from the European Union and the United States. Thirdly, the historical development of South Africa and Swaziland has created commodity specific assets. infrastructures and institutions that have promoted the development of the case study industry sector. Other factors influencing the uncertainty of sugarcane supply include the production practices of the growers, sugar prices and agronomic, biological and climatic variables.

Conversely, it can be argued that sugarcane supply in the case of the TSB supply chain has experienced moderately higher levels of uncertainty due to the fact that the company estates only supply 18% of mill capacity. The company has relied on contracted medium to large scale growers to supply 64 % of sugarcane processed and contracted small-scale growers to supply 18 % of mill capacity. The reliance on small-scale growers is set to increase when an additional 240 farmers, occupying 1800 hectares, start supplying the Komati mill when the Nkomazi Project comes on

stream. The company is also in the process of a land reform program that will result in the unbundling of a portion of its estates by way of a small-scale grower project.

A number of factors could increase supply uncertainty in both operations. The different time horizons of contracted farmers and the company operations with respect to their involvement in the sugar industry could increase supply uncertainty. The growers' time horizon would normally extend to an approximate ten year ratoon cycle, after which the farmer will re-evaluate his/her opportunity cost of re-investing in sugarcane production for a further ten year cycle. Conversely, both the company operations are geared to a minimum twenty five year time horizon. On the basis of the current contract arrangement, both agribusiness processors have no guarantee that their contracted growers will remain in the sugar industry for this period. Furthermore, mutual asset specificity is reduced by the fact that contracted growers can utilise their plant and equipment, largely irrigation facilities, to produce substitute crops like bananas, pineapples, citrus and litchis. The uncertainty of this re-investment decision is increased by the current volatility-over supply on world markets, the chances that preferential tariffs will be rescinded, the possibility of increased water tariffs and alternative high value cash crops.

A number of interlocking factors, however, contribute towards the reduction of supply uncertainty in both case studies. Supply uncertainty is reduced by the fact that the production practices, technologies and quality employed by the contracted growers are monitored-enforced by the processor in a joint quest to optimise the sucrose content of the sugarcane. Both companies exert high levels of managed control over the growers in a supply arrangement that is complex, difficult to enforce legally and relies on the mutual interests of the two parties. The contracted growers are locked into the supply relationship because there are no better opportunities, as well as because of a range of both monetary and non monetary benefits that can be associated with the relationship. Firstly, the agribusiness partner provides inputs, credits, technical advice and government grants on a far less costly basis than external suppliers, as well as absorbs the related administration costs. In certain instances, moreover, financial institutions will only lend to the grower on the basis of an agribusiness supply agreement. Some sugar companies in Swaziland and South Africa have attempted to further reduce supply uncertainty by investing a portion of

the growers' revenues in a trust account to ensure the continuity of small-scale supplier operations and the broader welfare objectives of the farm family. The contracted grower would lose many of these benefits as a result of the cessation of the contract. Secondly, company programs to provide education, health, communication and recreational facilities in local company related communities implies a withdrawal of these facilities in the event of the termination of the contractual relationship Thirdly, the location of growers land and farming assets increases the mutual asset specificity between the parties and delivery to another processor would incur incremental delivery and spoilage costs. Mutual asset specificity is increased by the fact that many contracted farmers have been in the sugar industry their whole lives and their skills and knowledge are industry specific. Finally, the important issue of trust between the parties has influenced lower levels of supply uncertainty.

Trust

Trust reduces supply uncertainty as a result of a reduction of moral hazard and opportunism in the supply arrangement (Ring & Van den Ven, 1992; Foss, 1995, Tregurtha & Vink, 1999; Gow et al, 2000). A quantitative study of the MSCo small-holder sugarcane supply operation was used to estimate the level of trust these farmers had with regard to their agribusiness partner and the sugarcane supply arrangement (Sartorius et al, 2003). Two aspects of contractual relationships were isolated in this study, namely, the satisfaction of both the company and the cane growers, as a measure of the chain performance, and the level of trust as an important antecedent to performance. To measure satisfaction, farmers responded to a Likert scale that ranked their response about the price paid for their sugarcane, the suitability of the present payment system, the suitability of the procedure used to test their sugarcane for sucrose content and the level of technical assistance received from the industry. The Likert scale measurement 1 indicates high levels of trust and 5 indicates high levels of distrust. According to results of the survey, illustrated in Table 5.6, small-scale cane growers are presently marginally dissatisfied with the price paid for sugarcane, though there was a wide variation in the response. However, they appear to be satisfied with the payment system, the procedure for testing cane and the level of technical assistance. The aggregated results, moreover, reveal that

small-scale cane growers are satisfied with the general performance of the MSCo supply chain.

Table 5.6 : MSCo Small-Scale Farmer Perceptions of Supply Relations

Item	Mean	Std Deviation
Price paid for cane	2.6486	1.0127
Payment system	2.1067	1.0600
Procedure for testing cane	2.4865	0.8639
Technical assistance	1.9730	0.8436
Average	2.3037	

*1 Very Happy , 2.5 Satisfied, 5 Unhappy Source: (Masuka, 2002)
Source: Masuku, 2003

Trust between small-scale cane growers and MSCo, was also measured by a Likert scale with the same parameters. Table 5.7 indicates that small-scale cane growers have a reasonable level of trust in the mill, when it comes to their relationship. This implies that cane growers do not suspect any opportunistic behaviour by the mill. These results contradict the findings of Milford (2001) in the Australian Sugar Industry. Milford attributed the lack of trust between growers and the mills to poor performance in the past, individualism on the growers' part and perceived power and information imbalances. In the case of MSCo, the presence of trust could be attributed to the well co-ordinated activities of MSCo, the growers and the Swaziland Sugar industry. The growers are represented in the Swaziland Sugar Association (SSA) who are, in turn, involved in the contractual process of establishing supply contracts, as well as the determination of grower revenues. MSCo, moreover, employs local company officers who understand and interface with the farmers in their own language.

Table 5.7: Small Scale Cane growers' trust of their relationship with MSCo

Item	Mean	Std Dev
Decisions by millers are meant to benefit both millers and cane growers	2.3944	0 6862
The miller does not cheat farmers	2 6000	0 9231
The mill is concerned about the welfare of cane growers	2.0137	0 7359
There is mutual understanding between millers and cane growers	1 7568	(7189
Millers are generous with information	2 6986	1 499
The mill is reliable	2 0571	(8145
Farmers have to scrutinise information given by millers.	2 78)8	78(1
Average	2 3288	

Source: (Masuku, 2003)

The company is extensively involved in the community and maintains both schooling and medical facilities for a large number of its workers who, in many cases, also interact with small-scale farm suppliers. On the basis of the results of the case study, including the survey of trust, this study has concluded that the level of supply uncertainty can be graded as low to intermediate for the MSCo and TSB sugarcane supply operations respectively. The results suggest a low level of uncertainty of supply can be allocated to the company estates and a low-intermediate level to the contracted growers. The projected increase of small-holder supply of 6 000 hectares (Komati Project) in the case of MSCo and 1 800 hectares (TSB-Nkomazi project) is expected to increase supply uncertainty in the future.

5.6 Do Transaction Characteristics Influence Governance Structure?

The relationship between a set of transaction characteristics and a range of governance forms was illustrated in Chapter Three that demonstrated that organisation structure is a function of the transaction characteristics of frequency, asset specificity and uncertainty. Alternatively, the matching of transaction characteristics and organisation structure can also be approached from a contracting theory perspective that suggests that certain levels of frequency, asset specificity and uncertainty are best accommodated by certain types of contracting conditions that, in turn, are best accommodated in specific kinds of governance structures. Contract conditions that influence the choice of control structure include the ability of the parties to walk away from the contract, the availability of substitutes, the degree of identification of the parties, the duration of the contract, the level of ex ante control and ex post importance, the level of shared information and the ability to enforce the contract (Coase, 1937; Williamson, 1981;1996; 2000; Mahoney, 1992; Petersen & Wysocki, 1997;1998).

The process of matching the actual transaction and contract characteristics of a firm with an optimal governance structure was illustrated in Chapter Three and refined in the conceptual framework of Chapter Four. The selection of an optimum governance form for the MSCo and TSB cane supply operations is illustrated in Table 5 8 The conceptual framework has been structured to reflect five different governance forms (Columns 2-6) that are matched with each of the different transaction and contract

characteristics (Rows 2-16). Each of these characteristics, in turn can be graded in terms of five levels and each graded characteristic can be matched with one of the governance forms in the columns.

Table 5.8 : Matching Transaction Characteristics with the Level of Managed Control

Vertical Co-ordination Continuum / Variables	1. Spot Market	2. Specification Contracting	3 Strategic Alliance	4 Formal Co Operation	5 Full Vertical Integration
a) Actual MSCo Structure Actual TSB Structure		33 % 82 %			67 % 18 %
b) Transaction Characteristics	1. Low	2. Low-Int.	3 Interm.	4 Int -high	5 High
Frequency	Low	Low-Medium	Medium	Med-High	High MSCo 52350 TSB 136000
Asset Specificity	Low	Low-Medium	Medium	Med-high	High MSCo– R 2 b TSB – R 2 3 b
Uncertainty	Low	Higher MSCo	Medium TSB	Med-high	High
c) Contract Characteristics	1. Classical	2. Classical-neo classical	3. Neo-classical	4 Neo- class Relational	5. Relational
Level of Control	Low external	Low internal MSCo = 33% TSB = 82 %	Medium-internal	Hierarchy	High MSCo 67 % TSB 18 %
Ability to walk away	Yes	Yes/lower MSCo = 33% TSB – 82 %	Less	Low	None MSCo 67 % TSB 18 %
Substitutes	Yes	No	Less	No	No MSCo & TSB
Parties have own identity	Yes	Yes MSCo = 33% TSB = 82%	Yes	No	No MSCo 67 % TSB – 18 %
Duration	Short	Longer	Long 10years MSCo– 37% TSB = 82 %	Long	Long 25 years MSCo 60% TSB 18 %
Ex ante control	High	Lower	Low	No MSCo& TSB	No
Ex Post Importance	Low	Higher	High	High MSCo& TSB	High
Information Shared	Low	Higher	High	High MSCo& TSB	Extensive
Enforcement	Legal	Legal-complex MSCo =37 % TSB = 82 %	Legal-complex	Hierarchy	Hierarchy MSC0 67 % TSB 18 %

Based on Chapter Four: (Williamson, 1975; 1981; 1986; Mahoney, 1992.Petersen & Wysocki, 1997, 1998 Sartorius & Kirsten, 2002)

The actual governance forms (a) of the cane supply operations, described in Section 5.5.1, demonstrate that both companies co-ordinate the sugarcane supply operations with a combination of full vertical integration (5) and specification contracting (2) The actual transaction characteristics (b) of both the MSCo and TSB sugarcane supply operations, indicate a high level of frequency (5), a high level of asset specificity (5) and a low-intermediate level of uncertainty (2). The high level of transaction frequency has been based on the annual volume of sugarcane deliveries to the sugar

mills of the two companies. High levels of asset specificity, in both companies, are the result of high cost sugar industry assets (R2bn) that have been accumulated over time. The level of supply chain uncertainty, as discussed in Section 4.5.2.3, indicates a low-intermediate level of uncertainty for MSCo and a medium level of uncertainty for TSB largely because TSB company estates only supply 18 % of sugarcane requirements whilst MSCo company estates supply 67 %. According to transaction cost theory, the actual transaction characteristics of high levels of transaction frequency (5), asset specificity (5) and low to intermediate levels of uncertainty (2) would appear to be best accommodated in a governance structure ranging between specification contracting and full vertical integration (Coase, 1937; Williamson, 1981;1996; 2000; Mahoney, 1992; Petersen & Wysocki, 1997;1998).

A summary of the actual contract conditions (c) of the two supply chains, indicates that control is complex-internalised (2-5). In the case of the MSCo company, 67% of supply (the company estates) has no ability to walk away from the contract (5) whilst in the case of TSB only 18 % of supply is fully internalised in the company estates. On this basis, 82 % of TSB supply has the ability to walk away (2) from the agreement in the long term, significantly increasing the level of supply uncertainty over that of the MSCo company. In the case of both companies, there are no substitutes (5), the duration of the arrangement is ten years or more (3-5), there is a low level of ex ante control (4), a high level of ex post importance (4) and a high level of information (4) shared between the processor and the growers. There also appears to be a limited ability to legally enforce the contractual conditions of sugar supply (2-5). Collectively, the actual contract conditions appear to be best co-ordinated in a more relational type of contract structure that would be optimally accommodated by a governance structure that ranges between specification contracting and full vertical integration.

The actual governance forms (a) of both MSCo and TSB do not contradict the suggested optimal governance structures proposed by the actual transaction and contract characteristics of the supply chains. The actual MSCo governance form, however, leans more towards full vertical integration than the governance form of TSB, that is more weighted towards specification contracting The results, however, appear to suggest that the actual transaction and contracting characteristics of the

sugarcane supply operation influence the minimum level of managed co-ordination rather than the maximum level of managed co-ordination. This being the case, the question needs to be asked whether sugarcane could be acquired by way of a governance structure with lower levels of managed co-ordination than specification contracting.

The open market purchase and delivery of 1.3 million tons and 3.6 million of sugarcane, by MSCo and TSB respectively, would result in a multiple classical contracting situation. The companies would be required to significantly expand both the procurement department and the quality control function, resulting in an increase in fixed overheads. The high cost asset specificity of the processing operations, moreover, could result in undue supplier opportunism in open market conditions that would place the processor in an untenable bargaining position. The presence of other mill groups competing in an open market situation could, further, act as a negative influence on supplier opportunism. The harvesters, the market, the buyers and the transport companies would also have to operate on a real time basis due to the perishable nature of the product, combined with the need by MSCo and TSB to service company capacity of 7000 and 19 000 tons of sugarcane per day respectively, on a continuous basis. The purchase price on an open market basis would also operate on a supply and demand basis, with a glut occurring in the peak harvesting period between April and May and supply shortfalls occurring between May and June The need to make constant use of high fixed cost processing assets, requires a higher level of security of supply and delivery than the open market system can guarantee Given the co-ordination requirement, the volume of supply, the perishability of the raw commodity, the nature of the suppliers, the need for consistent quality and the high cost of the processing facilities, the level of contracting costs and supply uncertainty would be excessive if sugarcane were to be acquired by an organisation structure with lower levels of managed control than the governance structure of specification contracting.

The study agrees with the literature and concludes that the spot market is unlikely to be as synchronised as contracting with respect to ensuring the continuous supply of a uniform quality raw commodity (Glover, 1984; Kilmer, 1985; Glover, 1994; Mahoney, 1992; Hennessy, 1996; Azzam, 1996) On the basis of the results,

both the MSCo and TSB operations appear to employ a suitable governance structure to co-ordinate the transaction and contract characteristics of the sugarcane supply operations. Because TSB company estates only produce 18% of supply requirements, however, it may be appropriate to increase the level of managed control of contracted supply by some means. In conclusion, the results of the study suggest that the transaction characteristics of the grower-processor supply chain do indeed influence the minimum level of managed co-ordination, namely, specification contracting, in order to co-ordinate the activities of the sugarcane supply-processing operations. These results support the conceptual framework that has been developed in Chapter Four and concur with the overwhelming empirical evidence of the relationship between the transaction characteristics of the firm and governance structure (Masten, 1996; Williamson, 2000).

5.7 Is Transaction Cost Influenced by the Prevailing Institutional Framework ?

This section seeks to demonstrate that a range of social-historical variables have influenced the prevailing institutional framework of the sugar industries in South Africa and Swaziland and that, the transaction cost of the sugar industry is constrained within this framework. This section also seeks to demonstrate that firm-industry level cost reduction can be extended to include the benefits of favourably influencing the prevailing institutional framework including property rights economics, human behaviour and government policy.

5.7.1 The Institutional Framework

The institutional framework confronting the sugar industries of South Africa and Swaziland have been evaluated with respect a range of social-historic influences, macro-economic forces and the natural resources of the countries

5.7.1.1 Social-Historical Influences

Swaziland's colonial history, in conjunction with a long ruling monarchy system and the country's natural resources, have fundamentally influenced the cognitive, cultural, political and structural dimensions of society. South Africa's colonial history,

combined with effects of apartheid and the country's natural resources, have also profoundly influenced the institutional framework and property rights economics of society. Since the earliest times, agriculture in South Africa has concentrated in areas that are rich in natural resources (Bundy, 1979; Schirmer, 2000) and a history of South African Government policy, from the 19th century until the 1980s, reveals that black agriculture was systematically depressed whilst, simultaneously, providing artificial support for the white commercial farm sector. (Bundy, 1979; Kirsten & Van Zyl, 1996). Conversely, Swaziland, a former British colony, has been ruled by a monarchy that has a major investment in the control of the sugar industry (Daniel, 1982; Kerr & McDonald, 1994). MSCo, for instance, is 50% owned by the Swaziland Nation and 50% owned by the Commonwealth Development Corporation. The monarchy, as a partner, is thought to have influenced the transaction cost of the sugar industry as a result of having broader equity objectives (EQU) than a normal commercial partner. The cost of contract enforcement over amongst, for instance, farmers on traditional land, has been influenced by the pervasive presence of the monarchy, tribal law and colonial legacies. The Commonwealth Development Corporation, for instance, has influenced the equity objectives of MSCo which has a high level of investment in local communities including a village, a school and a hospital. The maintenance of these facilities, in turn, has constrained the ability of the company to reduce transaction cost. These factors illustrate how the norms, customs and traditions of society, explained by social theory, exercise a pervasive influence over the long term characteristics of an economic system (Williamson, 2000) The impact of these historical legacy variables has influenced the prevailing institutional framework and property rights economics of the two countries as follows:

Swaziland's colonial history and the patriarchal Commonwealth Development Corporation (CDC) management style have influenced human behavioural variables (BEH) in the sugar industry that incorporate work ethics, organisation culture, absenteeism and service condition (Atkins & Terry, 1995). Conversely, black-white human relationships in South Africa have been influenced by colonialism and apartheid and, combined with the perceived exploitation of farm workers, have created certain tensions that, in many instances, have resulted in a long history of resentment, exploitation, marginalisation and distrust in the farm sector (Bundy, 1979, Fenyes et al, 1988;Porter & Phillips-Howard, 1997a; 1997b; Schirmer, 2000)

Historical investment patterns in the Swaziland sugar industry have created barriers of entry (BARR) to the industry and determined the distribution of infrastructure and services. The original investment in MSCo in the 1950s has largely contributed to the current asset value of plant and equipment that is in excess of R 2 billion Swaziland also benefited from the pariah status of South Africa before 1994, when economic sanctions were applied to that country. High levels of inward investment in this period contributed towards the growth of the manufacturing sector, including agricultural processing. Swaziland, in this period, was open to domestic and foreign investment and readily offered cheap resources like land and labour. The establishment of irrigation projects, some jointly with South Africa (Funnell, 1988), has specifically provided the sugar industry with the ability to grow irrigated sugarcane. The sugar industry in South Africa was also established at a time when government policy and special subsidies were freely available (Kirsten & Van Zyl, 1996). The South African government provided vital infrastructure and services in support of the development of the sugar industry including roads, communication, irrigation and power. South African transport costs of US$ 10 per ton, for instance, are the lowest in Southern Africa and stem from the original government investment in infrastructure in support of agriculture. Barriers of entry to new entrants, therefore, exist because of the increasingly marginal potential of the remaining areas that are suitable for sugarcane, the differential logistics cost and lower levels of government and NGO support.

Local-National government services in both countries (LGS) are often costly and ineffective. The inefficiency of both local and central government in South Africa has delayed the authorisation-funding of small-scale farming projects in the sugar industry. The bureaucracy costs of dealing with government and local government are a function of the political agenda of the current incumbent civil servants, combined with the effects of inheriting certain structures from the previous government and a pre-occupation with legislation to correct the legacies of the past (Van Zyl & Kirsten, 1999).

Preferential trading prices (PTA), which make up in excess of 50% of MSCo revenue, have created a competitive advantage for MSCo in the Southern Africa region As a

result of the 1975 Lome Protocol, MSCo is paid a preferential price by both the European Union and the United States (Atkins & Terry, 1995). The Swaziland sugar industry is also a member of the Southern African Customs Union and domestic prices are therefore influenced by this relationship (Strathdee, 1990; Economist Intelligence Unit, 1994).

Swaziland has a dual structure of land tenure dating back to the 1907 Land Act (REG). A majority of sugar producer companies and white commercial farmers hold title deed land, whilst Swazi farmers operate under a system of traditional land rights (Levin, 1986; Coppens, 1988; Funnell, 1988; Russell, 1993). Swaziland's land tenure policies, in conjunction with rural authority structures, have profoundly affected the structure and cost of rural farmer associations (Levin, 1986). Similarly, South African agriculture operates under a number of land tenure arrangements. Whilst agribusiness and white commercial farmers mostly hold freehold title or long term leases, a large proportion of emerging farmers still occupy land under Proclamation R 188 of 1969 that pertain to areas that were formerly classified as traditional homelands. For many decades, the skewed pattern of land ownership in South Africa has created tension and the cost of farming for new entrants is likely to be influenced (Van Zyl & Kirsten, 1999).

The sugar industry in Swaziland is influenced by government regulation (REG), incorporated in the 1976 Sugar Act. Similarly, the South African sugar industry is regulated by the 1978 Sugar Act. This regulation has a fundamental influence on the performance of the industry and its players and controls the miller-grower split, the conditions that govern new entrants and the research and development of new technologies. Regulation in these two countries includes legislation influencing labour, water, power, agricultural policy and all the key variables influencing inputs to the sugar industry. Low cost labour, in particular, has been a key feature of government policy in Swaziland (Atkins & Terry, 1995) whilst recent labour legislation in South Africa has elevated labour cost. Government regulation in South Africa from 1994, including the development of the constitution, has been developed to redress past injustice. Whilst it can be confidently stated that current regulation supports the interests of the majority of the population, it has been suggested that the

current government has created unworkable legislation in certain areas (Van Zyl & Kirsten, 1999).

5.7.1.2 Macro Economic Factors

Macro-economic factors that have influenced the Southern African sugar industry include the exchange rate of the South African Rand and the effects of inflation The exchange-inflation rate of the Rand is, in effect, a function of a wide range of economic indicators, combined with investor sentiment, that are both rooted and based on a plethora of local-international events and indices. The sugar industry has also been influenced by overproduction and world markets are currently volatile, with the possibility of further deregulation. The sugar industry, moreover is also one of the most regulated sectors of agriculture and sugar producers, in countries like the United States, are often effectively shielded from competition by subsidies The Southern African sugar industry reflects the uncertainty of this sector with multinational companies like Rembrandt and Anglo American reconsidering their involvement. Macro-economic factors (ME) influencing the economy of Swaziland, including the transaction cost of the sugar industry, include the influence of the South African economy, the volatility of world markets and restructuring within the industry. Swaziland is part of a common monetary area that is dominated by South Africa and its currency is pegged to the SA Rand. The monetary and fiscal policy of Swaziland has, therefore, been influenced by South Africa (Funnell, 1988,1991)

A world wide trend in recent decades has witnessed a reduction in government funding of research and development (RES). This trend is thought to be the result of the changing structure of the agricultural sector, deregulation and the industrialisation of agriculture. The declining levels of research and development have, largely, been absorbed by the modern agribusiness supply chains (Pasour, 1998). In South Africa, however, some research and development in the sugar industry is still conducted by the statutory South African sugar bodies. Finally, the impact of AIDS, a human immune deficiency disorder (DIS), that is rooted in a historic evolutionary pattern of emerging pathogens, is a further environmental variable that could particularly influence the sugar industry, which directly employs some 100 000 individuals and indirectly a further 300, 000 people.

5.7.1.3 Natural Resources

The natural resources (NR) of certain regions in Swaziland have also contributed to the competitive nature of the Swaziland sugar industry. Water is a critical variable in sugarcane production and the future cost of this resource will influence the cost structure of the industry. MSCo sugarcane is 100% irrigated and the mean annual rainfall of 500-700 mm per annum is insufficient to sustain high yield levels (Atkins & Terry, 1995). Other physical factors in the environment that have influenced sugarcane production, include soil quality and topography, heat-humidity, insects and disease. In South Africa, the natural resources (NR) of Mpumalanga have long attracted farming activity to the region. This region is one of the few areas in South Africa that can support the irrigated production of sugarcane. The rainfall, the temperature, the topography and the soil conditions are, therefore, a fundamental set of variables that restricts the location, size and transaction cost of the sugar industry The future cost of water will have a major influence on the cost structure of the industry. The establishment of irrigation projects, some jointly with Swaziland, namely, the damming of the Komati River (Funnell, 1988) has resulted in an expansion of irrigated sugarcane. TSB sugarcane is 100% irrigated although the area receives a mean annual rainfall of 500-700 mm (Atkins & Terry, 1995) Other physical factors in the environment that have influenced TSB sugarcane production include moderate to good soil quality.

5.7.2 Transaction Cost and the Prevailing Institutional Framework

The impact of historical-social variables on the transaction cost of the MSCo and TSB sugarcane supply chains, is illustrated in Table 5.9. The economics of these transaction costs are explained by the Williamson (2000) three stage economising model developed in Chapter Three. This model proposes that the long term history of a country (100- 1000 years), as explained by social theory, establishes the property rights economics and institutional framework for a period of ten to a hundred years The institutional framework of a country, partially explained by positive political theory and institutional economics, in turn, influences property rights, the judiciary and bureaucracy costs. Transaction cost, moreover, is a function of the prevailing institutional framework and can only be minimised within these constraints

Transaction cost, therefore, can only be optimised once the prevailing institutional environment has been economised. This proposal suggests that the firm can influence the institutional framework by taking the necessary action to influence bureaucracy cost, the formal rules that prevail, legislation, property rights and social attitude

The transaction costs of the sugar industry in Southern Africa have been influenced by human behaviour. The common colonial history of the two countries, the monarchy in Swaziland, education and apartheid in South Africa have influenced the culture, religion and society norms of the region. These factors have influenced black-white perceptions, work ethics and opportunism.

Table 5.9 Social-Historical Variables Influencing Transaction Cost in Southern Africa

The Prevailing Institutional Environment	Transaction Cost
1. Behavioural costs (BEH) as a result of colonial past, the presence of a monarchy (Swaziland) and apartheid (South Africa).	1. Transaction cost affected by culture, norms, work ethics that influence principal-agent cost including uncertainty, moral hazard, supervision cost, training costs, education, absenteeism
2. Historic Establishment (BARR) of MSCo and TSB, infrastructure concentration of sugar Industry, Barriers of entry Patterns of Ownership. Monarchy partner. Development of Local Government Structures (LGS). Preferential trade agreement (PTA) Lome Accord (MSCo)	2. *High start-up cost for new entrants Lack of infrastructure for new entrants High levels of asset specificity concentrated *Monopoly advantages accrue to first movers *Influence availability, efficiency and cost of essential structures and services *Preferential tariffs received for Swaziland sugar sales to EU and US markets Influences
3. Role of government (EQU), Commonwealth Development Corporation, Industrial Development Corporation as partners	3. Transaction cost influenced by high level of equity Objectives.TSB and MSCo heavily invested in community including school, village and medical care
4. Government Regulation (REG) including Land Tenure Act of 1907. Sugarcane Act of 1976 in Swaziland and Land Act R 188 (1969) and Sugar Act 1978 in South Africa	4. Cost of power, water, tax, labour. Split of grower miller proceeds Economics of property rights
5. Decreased levels of Government funding For Research (RES	5. Research internalised in agribusiness supply chains Transaction cost of technology acquisition has Shifted to private sector
6 Macro-economic influences (ME) including proximity to South Africa, behaviour of world markets, restructuring in sugar industry eg Rembrandt-Anglo American). Over supply in world market, increasing number of producers. Behaviour of Brazil. AIDS Pandemic	6. Exchange rate of SA Rand, Inflation, cost of Finance, insurance, transport, other institutions Cost, availability and productivity of labour in Southern Africa to be influenced by AIDS
7. . Natural resources (NR) of sugar growing areas.	7 Favourable climate, topography, soil influences cost structure of local sugar growers and needs for contracted goods-services

Based on Chapter Three and Williamson (2000)

The influence on transaction cost is reflected in South Africa labour relations, the constitution, the labour acts, the presence of the unions and the high cost of labour generally (Atkins &Terry,1995; Porter & Phillips-Howard, 1997a,1997b) Behavioural variables, on the basis of social and positive political theory (Williamson, 2000).

affect the levels of transaction cost and uncertainty in contracting relationships These variables have specifically influenced principal-agent cost, labour productivity, the structure of the labour market, supervision cost, labour turnover costs, absenteeism and worker sabotage. The constitution, the judiciary and the extent of labour unionisation in South Africa have all been profoundly influenced by the historical legacies of the country.

The historic establishment and concentration of the sugar industries in both countries has influenced the transaction cost of the respective players. The early concentration and expansion of the sugar industry were backed by the governments of both countries, that proceeded to develop communication and infrastructure facilities in order to promote economic development. The current transaction cost of the sugar industry in Southern Africa, including high levels of asset specificity, has therefore been influenced as a result of being a "first mover" combined with extensive government support. The future demographics of the sugar industry have been irrevocably influenced by these historical legacies and the current structure constitutes a major barrier of entry to new entrants. The cost of entry, furthermore, is maybe aggravated because of a lack of infrastructure in other areas, the limited availability of suitable land and locations, as well as the quasi monopoly position of the established sugar companies.

Property rights economics, including the land tenure arrangements in both Swaziland and South Africa, have influenced the transaction costs of the industry In many instances the engagement of emerging farmers requires high levels of transactions because of the need to satisfy both local and traditional authority structures The sugar industry, moreover, is heavily regulated in South Africa (Sugar Act 1978) and Swaziland (Sugar Act 1976), influencing the cost of transacting for all inputs, pricing policies, the rights of the players, contract enforcement cost, subsidies and taxation liability. Legislation regarding the use of water and labour have specifically influenced the transaction costs of the sugar industry In certain instances, the inflexibility of the labour market in South Africa has contributed towards a changing structure in the sugar industry, with higher levels of contracted costs and lower levels of direct labour.

The social and equity objectives that were associated with the establishment of the sugar industries in Swaziland and South Africa, have resulted in high level of agribusiness investment in the local communities. The transaction cost of labour has been increased as a result of the social cost of providing certain facilities for employees and local communities. The sugar industry in Southern Africa often supports local medical facilities, schools and sporting facilities.

Wide ranging macro-economic influence on the transaction costs of the Southern African sugar industry includes preferential trade agreements (Swaziland), the economics of world sugar markets, international restructuring in the sugar industry, inflation and the oil price amongst many more factors The incidence of AIDS, largely in the black population, is projected to have a serious impact on productivity, medical costs and the cost of labour. The transaction cost of acquiring technology has increasingly become the responsibility of the agribusiness sector, as a result of a general withdrawal of governments around the world. The macro-economic influence on the transaction cost of the sugar industry is, therefore, both widespread and pervasive. Finally, the natural conditions of the sugarcane growing areas have also influenced the transaction costs of the sugar companies and rainfall, soil fertility and topography have a major influence on transaction cost (Rouse & Putterill, 2000)

5.7.3 The Transaction Cost Function

Despite the qualitative nature of the argument, combined with the fact that the prevailing institutional framework influences the transaction cost of all industry, the two case studies demonstrate the impact of the institutional environment in Swaziland and South Africa on the prevailing transactions costs of the sugar industry The results therefore support the second hypothesis, namely, that the transaction cost (characteristics) of the firm are a function of a range of exogenous social-historical variables. This conclusion supports the transaction cost function developed in Chapter Three and operationalised in Chapter Four.

5.7.4 Economising the Prevailing Institutional Framework

The Southern African sugar industry has the ability to influence certain aspects of the prevailing institutional framework. The industry exerts a wide influence in the economies of both Swaziland and South Africa. The Swaziland sugar industry employs in excess of 12 000 Swazis and is the largest employer in the country (Swaziland Sugar Association Annual Review, 1993). Between 1996 and 1999 sugar contributed around 11% to 15% of total export earnings of commodities and 20 % of GDP (Central Bank of Swaziland, 1989). On the basis of positive political theory (Williamson, 2000), the sugar industry has the size and importance to secure political economy objectives and favourable government policy to reduce transaction cost The South African sugar industry directly employs in excess of 85 000 and generates R 1.9 billion in foreign exchange. The Southern African sugar industry is clearly in a position to lobby government for favourable economic policy. In particular, these industries can lobby for amendment to both land tenure and labour regulation in order to reduce cost. Other legislation that could be favourably influenced includes government policy re water, power, development subsides and taxation regimes

5.8 Do Small Growers Generate Incremental Transaction Cost?

Agribusiness transactions in the cane supply chain include start-up costs, technical advice, the contracted growers use of inputs, cane supply-delivery transactions and the administration of the growers affairs.

5.8.1 Start-up and Establishment Costs

The start-up costs incurred by agribusiness with respect to small-scale farm supply projects, in both case studies, appears to have been considerable In many instances these costs have been incurred over a number of years before the smallholder projects began supplying. By comparison, larger suppliers incur their own start-up costs with respect to establishing production capacity, as well as complying with all the necessary steps to establish a supply contract. Both MSCo and TSB employ a full time development officer to establish small-scale suppliers. In the case of the Nyakafto Farmers Association, the Swaziland Government and MSCo provided inputs between 1994 to 1998 that included finances, management, technical skills and administrative facilities. Currently, the MSCo has allocated a development officer to support the development of the new Komati small-scale farm project (6000 hectares) that will commence supply in 2003-2005. Small-scale farmer start-up transactions, leading to a mill supply agreement for small-scale farmers, are also greater than those relating to larger growers. This is because larger commercial growers are capable of obtaining-preparing the documentation, whilst MSCo and TSB assist small-scale farmers through the various steps. These transactions include providing proof that the applicant is a registered supplier, that permission from tribal authorities has been received, demonstrating proof of water rights and supplying the details of the geographical location and soil conditions of the farming area. Both the companies, moreover, act as a banking intermediary by initiating bank loan facilities This differential level of small-scale farmer start-up transaction cost is especially reflected in the records of TSB, where a separate small-scale farm division with an annual budget of R 3 million facilitates the development and guidance of these projects

5.8.2 Harvesting-Delivery Transactions

A large volume of grower transactions occur in the cane supply and delivery system Larger growers, like the company estates, deliver sugarcane to the company mills every day of the week whilst smaller growers operate on a five day week or less The MSCo estates supply in the region of 2700 tons per day to the company mill whilst large growers deliver between 250 and 800 tons per day. Medium growers supply in the region of a 50 to 250 tons per day and small growers from 5 tons to 50 tons per day. The total volume of deliveries to the MSCo mill is in excess of 52 000 truck

loads per year. Similarly, the TSB estates and contracted growers deliver in excess of 136 000 loads per year to the company mills . The delivery system in both operations has been standardised to specific bundle sizes and tonnage so that small suppliers generate no additional transactions compared to larger suppliers Rig loads are standardised to around twenty five tons for all growers. There is, thus, no differential cost to the company for dealing with small farmers in the cane supply system although the company interaction time and administration, for instance, at daily sugarcane supply meetings with small-scale growers, is probably disproportionately higher than larger growers.

5.8.3 Administrative Transactions

The administration of suppliers accounts reveals that small-scale grower transaction cost per ton of sugarcane delivered, is greater than larger growers. The administration of growers affairs-payments is effected in the company creditors system that generates a weekly payment, in cheque form, for the weekly tons delivered to the mill. The creditors system also adjusts this payment for bank loan repayments and items drawn from stores, use of garage facilities and chain maintenance. A sample of administration transactions is illustrated in Table 5.10 and summarises the tonnage delivered, in conjunction with the number of administration transactions generated by the accounting system for the period 2001. The table indicates that, the higher the level of accounting transactions in relation to the tonnage delivered, the higher the transaction cost will be.

Table 5.10 : Volume of Accounting Transactions for 2000/1

Supplier	Annual Tonnage	Cheques Issued	Other Accounting Transactions	Total Accounting Transactions	Tons per Transaction
MSCo					
Supplier 1 Small	10429	20	71	91	114 6
Supplier 2 Small	9717	20	71	91	1 6 7
Supplier 3 Small	7252	17	79	96	75 5
Supplier 4 Large	217098	32	110	142	1528 8
TSB					
Supplier 1 Small	978	N A	N A	26	37
Supplier 2 Medium	10624	N A	N A	139	7, 4
Supplier 3 Large	47845	N A	N A	76	613 3

The administrative costs include the issuing of cheques, issues from stores and direct debit facilities with banks for outstanding loans. Larger sugar suppliers in the MSCo and TSB supply chains delivered 1528 8 tons and 613 3 tons respectively per

transaction. Conversely small-scale to medium suppliers in the MSCo supply chain only delivered between 75.5 tons and 114.6 tons per transaction. The higher cost of small-scale supplier administration is also reflected in the TSB supply chain, where between 37.6 and 76.4 tons per transaction were incurred. The differential administration cost of small-scale suppliers is often further exacerbated by the bank's insistence that the company administers smallholder loan agreements through the company accounting system. Furthermore, this category of grower makes increased use of company services and inputs that are administered through the accounting system.

5.8.4 Differential Smallholder Transaction Cost

The results of this section suggest small-scale growers generate higher levels of transactions cost than larger suppliers. The primary reason for the incremental level of transaction cost is caused by differential levels of start-up cost and the administration of growers affairs. Medium to large contracted growers, largely, self develop their capacity to operate as sugar growers, whereas small-scale growers appear to be supported throughout this phase of operations by both the MSCo and TSB companies The duration, moreover, of this start-up phase can extend to a number of years during which time certain company resources are allocated for the development of this category of grower. Smaller growers also generate differential levels of administration transaction cost because they deliver smaller volumes per week and make more use of company facilities per ton of sugarcane delivered. The results of this section appear to support the contention that contracted small-scale farmers generate incremental levels of transaction cost in supply relationships with agribusiness (Glover, 1984, 1987; Barry et al, 1992; Runsten & Key, 1996; Coulter et al, 1999).

5.9 Small-Scale Farmers in Contract Relationships: Performance and Costs

Small-scale farmers compete with medium to large growers in both the MSCo and TSB sugarcane supply operations. Currently, 18 % of the sugarcane processed by both of the agribusiness companies is grown by contracted small-scale growers Both companies have a long standing relationship with this category of grower The question remains, however, as to whether this category of grower is as efficient as the company estates and the other medium-large scale contracted farmers The

performance of growers, at 1999 prices, of the growers between 1996-2001 is reflected in Table 5.11. The first row lists the growers Small-scale grower associations supplying MSCo are listed as Nyakafto (M-SF1), Vuvulane 1 (M-SF2) and Vuvulane 2 (M-SF3). Small-scale growers supplying TSB are listed as Madadeni (T-SF1), Figtree (T-SF2) and Malelane (T-SF3). MSCo and TSB appear to compete effectively with small farmers with respect to operating cost at R71 and R86 per ton respectively. In support of this, the cultivating cost per ton of both the company estates is less than the six selected small-scale farmer samples, suggesting higher levels of efficiency on the company estates than small-scale grower farms This is especially surprising since the small-scale farms would be presumed to have higher levels of labour incentives than the plantation type system of the company estates As a counter argument, the relatively capital intensive nature of the sugarcane growing operation would suggest that the small-scale farmers might be at a disadvantage

Table 5.11: Grower Performance

	MSCo Estate	MSCo M-SF 1	MSCo M SF2	MSCo M-SF3	TSB Estate	TSB T SF1	TSB T SF2	TSB T SF3
Area (hectares)	8302	203	1277	47	7250	38	857	N A
Production								
Cane (Mt)	3 343 675	74744	372232	5875	696583	4124	84942	N A
Sucrose	484 247	10305	N A	793.1	87401	567	11790	N A
Sucrose %	14.48	13.8	N A	13.5	12 5	13 8	13 9	N A
Yield	100.7	122.7	97.2	125.0	96	109	99	N A
	R/Mt	R/Mt	R/Mt	R/Mt	R/Mt	R/Mt	R/Mt	R/Mt
Sucrose Sales	179	169	169	164	140	145	132	151
Cultivating	30	38	26	41	46	51	59	55
Harvesting	29	25	27	31	34	38	31	32
Replanting	12	5	0	0	5	8	8	9
Operating Costs	71	68	53	72	86	97	97	96
Overheads	31	12	23	14	27	13	13	13
Total Cost	102	80	76	86	113	110	110	110
Agricultural Margin	77	89	93	78	27	35	22	51
Net Income/ha	7754	10920	9040	9750	2594	3815	218	N A

Small-scale growers appear to incur much lower levels of overheads than the company estates of both MSCo and TSB who display a similar overhead cost per ton at R31 and R27 respectively compared to an average cost of between R12-14 per ton for smallholder production. Only M-SF2 displays higher levels of overhead at R23 per ton. The reason for the high level of MSCo overheads is because the company incorporates numerous support facilities in its agricultural division These facilities include a laboratory, harvesting services, garage facilities, a transport fleet and an irrigation department. By contrast, small-scale farmers appear to contract for these facilities more cost effectively. In terms of total cost, the Swaziland small-scale

farmers appear to have grown sugarcane at a lower cost per ton than MSCo and their South African counterparts who are, at least, competitive with the TSB estates Small-scale farmer total costs for MSCo range from R76 to R86 compared to R102 for the company estate whilst for TSB small farmer costs are R110 compared to R113 for the company estate. In this respect, it would appear that the TSB estates are more competitive with their contracted small-scale farm suppliers than the MSCo agricultural division.

The performance of MSCo small-scale growers is especially impressive when considering the limited fixed assets employed. MSCo, for instance, has generated an average of R0.60 per R1.00 of the current net book value of fixed assets between 1998-2001, whilst the Nyakafto Farmers Association has generated R2.37 per R1 00 of assets. A source of concern in this instance is the low level of land preparation and replanting cost reflected in the small-scale farm accounts. This could signify a lack of strategic planning by the small-scale farmer organisations, however, in defence of small-scale farm strategy, the Vuvulane Farmers' Association has been in operation for a number of decades. Conversely, the Nyakafto Farmers' Association has only been operational for three years and the financial results, as yet, are unable to demonstrate the long term efficiency of this sample of small-scale farmers.

The cumulative evidence, at this stage, would suggest that the sample of Swaziland small-scale farm associations can operate as, or more, efficiently than the MSCo company estates. The principal reason for this competitive advantage appears to be because the smallholder operations contract more efficiently for a range of overhead facilities costs than the internally managed facilities costs of the company estates The results, in general, appear to confirm the contention that small-scale farmers are often more efficient than plantation type operations (Van Zyl, 1996) At worst, and taking into account the fact that the accounting treatment of the smallholder projects may have been incorrect, smallholders appear to at least operate as viable economic entities. In support of this conclusion, 18% of both MSCo and TSB sugarcane requirements have been supplied by contracted small scale farmer associations over long periods of time. These groups appear to operate as viable entities and have adhered to all the contractual conditions as stipulated in the supply contract On the basis of MSCo satisfaction with this category of grower, the company is in the

process of expanding small-scale farmer supply by 6 000 hectares or 46%. Similarly, TSB is expanding small-holder contracting by 1 800 hectares together with unbundling certain company estates. On the basis of these results, agribusiness cannot exclude smallholder suppliers because of lower levels of production efficiency.

5.10 Has Contracting Lowered the Barriers of Entry ?

This section discusses whether the institution of contracting has acted as a mechanism to allow small-scale growers to overcome the barriers of entry to the sugar industry. The surveyed small farmer organisations supplying MSCo and TSB both appeared to be established commercial farming operations. In the case of two Swaziland small-scale farmer associations, namely, Nyakafto and Vuvulane, the associations appeared well integrated into the modern agricultural sector in Swaziland. These organisations act as significant employers of labour, utilise modern management technologies, interact with harvesting, transport, banking and insurance institutions and maintain audited financial records. It is also clear that, without MSCo, combined with the institution of contracting, these associations would not have been able to overcome the barriers of entry into the sugar industry in Swaziland. Firstly, the economies of scale of processing would be insufficient to establish a separate sugar mill for small-scale farmers that could require in excess of R 1billion to establish. Secondly, often only farmers with a mill agreement are eligible for financial assistance. Moreover, both MCSo and TSB have invested considerable time and expense in the form of start-up costs to ensure the viability of small farm operations and related community structures. MSCo managed the administration of the Nyakafto Farmers Association for three years before it was able to exist as a separate entity.

In conclusion, the results of this case study suggest that both MSCo and TSB have acted as institutions that have allowed large numbers of contracted small-scale farmers to overcome the barriers of entry to the sugar industry and become commercial farmers. In both instances, the surveyed smallholder suppliers would not have overcome the barriers of entry to the sugar industry without the assistance of the agribusiness partner. This finding has, generally, been widely demonstrated in many developing countries where contracting has been cited as an institution to promote

rural development and transformation of the agricultural sector (Glover, 1984; 1987, 1994; Little & Watts, 1994).

5.11 Summary and Conclusion

The case study has been developed to test the research questions, as well as to evaluate the lessons developed in Chapter Two and the economic and conceptual arguments developed in Chapters Three and Four. This chapter summarised key issues in the history of the Southern African sugar industry and the performance and logistics of the MSCo and TSB companies. The economics of the sugarcane supply operations were then developed in more detail to include the categories of grower, the nature of the contractual relationship, land tenure issues and the transaction characteristics of sugarcane supply. The data were then discussed before using the results of the case study to separately address each of the five research questions.

The results of the case study, with respect to the first research question, suggested that the transaction characteristics of the sugarcane supply-processing operation influenced the choice of governance structure. These results support the conceptual framework of Section Three and clearly indicate that the MSCo and TSB processing operations require high levels of managed co-ordination to synchronise the sugarcane supply-processing chain. The results also demonstrate that the open market would not be able to support the logistics of the input-output function. Although it can be demonstrated that the transaction characteristics influence the minimum level of managed co-ordination, it is more difficult to assess the same relationship with respect to the maximum level of managed co-ordination. The reason for this is that fully integrated structures, whilst being capable of co-ordinating the respective activities, might incur higher levels of bureaucracy cost that could contribute towards the unsuitability of the governance structure. The results have demonstrated that an understanding of transaction cost theory can be employed to design suitable governance structures or alternatively, to check the suitability of existing structures. More specifically, an understanding of transaction cost economics can allow the integrator to determine the minimum level of managed co-ordination that is required to co-ordinate a given set of transaction and contract characteristics. Agribusiness companies, moreover can compare the actual level of managed control that they

exercise over their raw commodity supply structures with the optimum level as dictated by the actual transaction characteristics and contract conditions.

The case study tested the second research question by using the Williamson (2000) three stage economising model to demonstrate that a wide range of social-historical variables, including natural resources-physical constraints, have influenced the transaction costs of the Southern African sugar industry. The usefulness of this finding is that management can consider alternate ways of reducing transaction cost as a result of a better understanding of causality. Williamson (2000) suggests that the firm should attempt to shape institutional costs before matching organisation structure with the prevailing transaction characteristics. Southern African agribusiness has the necessary influence to persuade the government to introduce policy that could reduce transaction cost.

The results of the case study, with respect to the third research question, demonstrated that small-scale farmers generate higher levels of transaction cost than larger growers. This is mainly demonstrated in the start-up phase of grower activities and the administration of growers affairs. The extensive support and start-up cost of small-scale operations is demonstrated by the high level of inputs of the MSCo and TSB companies, the Commonwealth Development Corporation and the Swaziland and South African governments. By contrast, the agribusiness companies do not assist medium-large suppliers to establish production facilities and this category of grower self finances all contract establishment costs. The results also demonstrated a high differential level of transaction cost occurs in the administration of small-scale farmers' affairs because of the smaller volumes of delivery and the higher level of use of company inputs and facilities. The results of testing this research question can be usefully employed in not only identifying the different cost elements of transaction cost, but also the reasons for the differential level of small-scale farmer cost. These results can be used to form the basis of a series of proposals to reduce small-scale farmer transaction cost, as well as a basis to design a small-holder contracting model and suitable control systems. Differential transaction cost, by being clearly identified, can form the basis of redesigning contracting arrangements with small-scale growers or, alternatively, be used as a basis to influence government policy to introduce special relief for agribusiness start-up costs that support contracted small-scale

suppliers. The use of farmer associations in particular, has allowed both MSCo and TSB to reduce smallholder transaction cost. The results also suggested that agribusiness can employ control systems like activity based costing to identify the transaction costs of different categories of suppliers. The incremental cost of small-scale growers, in turn, can either be charged back or, alternatively, used as a basis to organise smallholder operations into larger business units.

The results of the case study, with respect to the fourth research question, suggest that smaller growers can effectively compete with the company estates on a long term basis. These findings, which are widely supported empirically (Van Zyl, 1996), can be used as a basis to convince government, donors and agribusiness that, although smallholders generate incremental transaction cost, they should not be excluded on the basis of production efficiency. This finding could also be used as a basis to promote the unbundling of company estates in order to promote the transformation of the agricultural sector. Furthermore, the results can be used as a basis to identify why there are cost differentials with respect to the same cost elements of the different farmer categories. The company estates could seriously consider contracting for support facilities instead of incorporating them in the company hierarchy. Finally, the results can also be employed to identify areas where small-scale performance can improve, as well as a basis for suggesting the optimum level of capitalisation.

The results of the case study, with respect to the fifth question, suggest that contracting can be used as an institution to overcome the barriers of entry to high value cash crops for small-scale operators. The results of the case study can be used by agribusiness as a basis to better understand the costs agribusiness incurs in order to provide this institution for smallholders. This cost, by being clearly identified, can form the basis of influencing government policy or, alternatively, as a basis to identify and charge back these costs to the respective growers. The principal benefit of the case study is a better understanding of the pitfalls and costs that agribusiness integrators can incur when embarking on small-scale contracting projects. The case study specifically demonstrates that permanent growers in the supply chain need to operate as viable business entities. Whilst support in the start-up phase is a necessary pre-requisite to overcoming the barriers of entry, the contracted farmers need to be weaned off the company structure on a long term basis. The case study is useful

because it can be used as a basis to estimate the agribusiness cost of ensuring that small-scale farmers overcome the barriers of entry. Finally, the results of this chapter are used in Chapter Seven as a basis to design a small-holder agribusiness contracting model.

5. 12 The Future

The South African Sugar industry is currently confronted with increasing levels of uncertainty. At present, some forty eight developing countries, excluding Brazil, produce 2.14 million tons of raw sugar. Seven of these countries produce around 79 % of total production. World exports represent a small proportion of this production which inherently relies on domestic consumption in the respective countries. There appears to be an increasing probability that world sugar markets could become oversupplied. A change in use of Brazil's sugar output, for instance, could fundamentally influence world sugar prices. Brazil currently produces some 20 million tons of sugar per annum with exports of around 10 million tons. Currently, this country uses the bulk of its sugarcane production to manufacture alcohol. Should Brazil decide to convert its energy source to oil, the world's largest sugar producer could force an oversupply on world markets. A downward pressure on prices in the future is also expected to occur as a result of the further liberalisation of world markets. Sugar prices, moreover, have vacillated in recent times with the premium between white and raw sugar dropping to a low of US $ 27.5 per ton in October 2000. Factors contributing towards price instability are assumed to be a series of new sugar refineries in Dubai, Jeddah, Taiwan and Nigeria with a combined refining capacity of 2 million tons. These countries, traditional buyers of sugar, are increasingly becoming self sufficient. Brazil and Thailand, moreover, have built new factories that could be converted to producing white sugar. Southern Africa could, therefore, find itself in a position of increasing output in the face of reduced regional-international demand. Many countries still impose an import tariff on white sugar in order to protect the local industry and sugar prices are projected to become increasingly volatile over the next decade. A major shift in sugar prices could force the growers' prices down and small-scale farmers could conceivably switch to other agricultural opportunities. Other threats to the industry include a major increase in energy costs and changes in the ownership structures of the sugar industry in Southern Africa.

Chapter Six: Sappi Case Study: Timber

6.1 Introduction

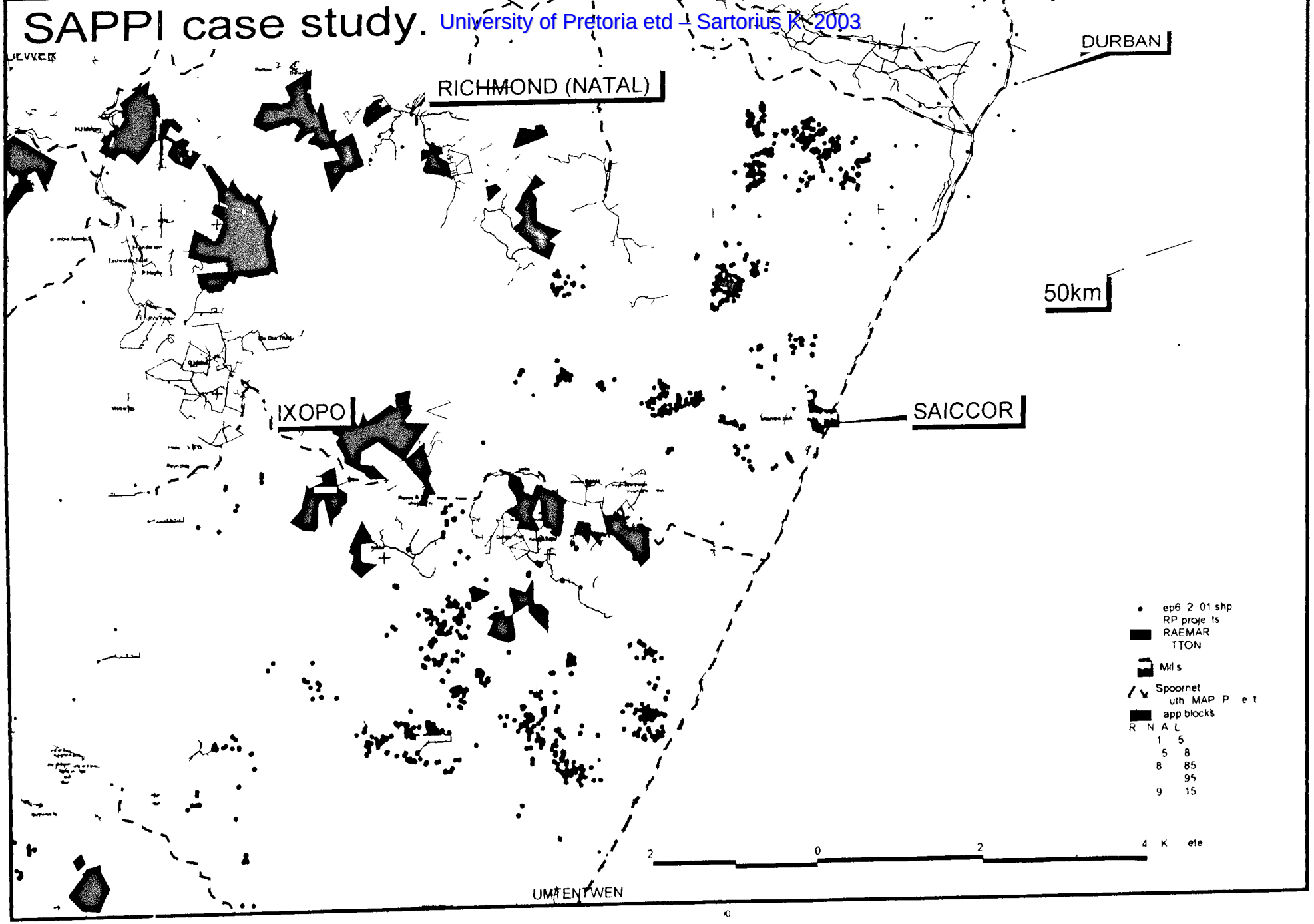
The objective of this chapter is to further test the research questions using a case study in the South African timber industry. The case study describes the Sappi-Saiccor Company on the Kwazulu-Natal South Coast. Figure 6 1 illustrates the location and layout of the timber supply chain. In particular the case study describes the Sappi Company's Project Grow contract farming experience involving a micro-grower program.

The chapter commences with a discussion of the background of the forestry industry in South Africa before introducing the Sappi-Saiccor operation. The chapter then describes the company operation and logistics before examining the data and the economics of the timber supply chain. Each of the research questions are separately tested with a view to emphasising and comparing the results with the previous case study in the sugar industry. Finally, a summary and conclusion is developed

6.2 The Forestry Industry in South Africa (Courtesy of Sappi Limited and the South African Forestry Association)

The forestry industry consists of two primary segments, the growing of timber which falls into the forestry sector and the processing of timber which falls into the manufacturing sector. The growing of timber, currently, contributes 8 % of the national agricultural gross domestic product and the manufacture of pulp and paper products accounts for 9 % percent of the national manufacturing gross national product. The industry makes a significant contribution to foreign trade and forestry products generated an annual net trade surplus of R 3 3 billion, or 8% of South African exports, in 2000/1. The industry has demonstrated a consistent annual growth of 8% over the last ten years and is one of the most global industry sectors in the South African economy (Forest Owners Association, 2001)

SAPPI case study.



The timber industry is a major employer of labour in South Africa In 2 00 1 the industry employed 135 000 people who were either engaged in the primary production of timber or the processing of wood. This sector also includes the support of over two million dependants, many of whom live in rural areas The estimated linkages effect generated by the industry would suggest an average multiplier of four resulting in a total employment potential of 500 000 people The industry is a major contributor towards the development of rural infrastructure and contributes R15 million per annum to the provision of housing and R40 million per annum to the provision of health care. Other contributions to rural infrastructure include R15 million per annum towards the provision of schooling and bursaries and R10 million per annum towards the maintenance of provincial rural roads

A high level of regulation has influenced the performance of the timber growing industry. The National Water Act of 1998, in particular, has increased the difficulty in obtaining water use licenses for afforestation purposes. The timber industry, although an active partner in the national water program, has been declared an industry that contributes towards a reduction in stream flow. The increased difficulty in obtaining water licenses has been most acute in the case of the emerging small-scale grower sector in KwaZulu-Natal and the Eastern Cape. A further threat confronting the timber industry involves the impending property rates bill that would be levied against the value of the land, and possibly, include improvements. Other issues restricting the expansion of the industry include environmental standards, fire losses, labour market legislation and a deterioration of infrastructure, security and local government services. Additional constraints include a reduction in government funding for research and development, increased taxation, the impact of AIDS and the high cost of transport and capital equipment.

The timber industry has promoted the development of 15 000 emerging timber growers, in addition to the promotion and support of forestry contractors and entrepreneur development programs. The expansion of small-scale farmer operations, illustrated in Table 6.1, has largely occurred by way of programs co-ordinated and sponsored by agribusiness or as a result of the informal-illegal expansion of timber growing in rural areas. The potential to expand small-scale growers has been

estimated at an annual growth rate of 17 630 hectares between 2001-2005 that would result in a total increase of 93 100 hectares involving approximately 10 197 new applicants.

Table 6.1: Small-scale Timber Production

Location	Area Planted in hectares		No. of Growers		Average Size
	Managed	Total	Managed	Total	
Zululand	16 125	32 250	6 155	12 310	2 6 hectares
Natal Midlands	5 258	7 361	3 580	2 944	2 5 "
Southern Natal	2 555	3 577	2 504	3 577	1 0 "
Eastern Cape	267	267	45	45	5 9 "
Total	24 205	43 455	12 284	18 876	2 3 hectares

Source: South African Firestry Association

6.3 The Timber Supply and Processing Operation

Sappi Forest Division controls the timber growing operation and all growers are either owned or contracted to this division. The supply chain consists of a range of growers that deliver timber on a continuous basis to the timber milling operation Company plantations are located at Umkomaas and Richmond, while both company and contract growers operate in the Kwazulu-Natal and Mpumalanga provinces Contracted growers are mostly located within a one hundred kilometre radius of the company mill and include a range of medium to large growers and a managed small-scale project, Project Grow. The volume of supply is illustrated in Table 6.2

Table 6.2 Timber Supply

Species	Road	Rail	Total	Tons
Gum	28545	12239	40784	1489203
Wattle	4631	1254	5885	174317
Total	33176	13493	46669	1663520

Source: Sappi-Saiccor

6.3.1 The Data

The data consist of the historical records of Sappi-Saicor, Sappi Forest Division, Project Grow and Forestry Economic Services (Pty) Ltd. Financial data were obtained from the Sappi head office in Johannesburg. The data for Sappi Forest Division were acquired from Forestry Economic Services, in Pietermaritzburg, Kwazulu-Natal and Johannesburg, as well as the head office of Sappi Forest division in Pietermaritzburg, Kwazulu-Natal. The cost data includes the results of a benchmarking exercise that was conducted between 1997 and 2000. The cost data for Sappi Forest are, largely, made up by two plantation areas, namely, the Richmond and Umkomaas areas Further comparative data, including the weighted average regional and national figures were provided by Forestry Economic Services and the Forest Owners Association located in Johannesburg. The medium to large scale grower data, based on a sample area of 61 000 hectares, were also obtained from Forestry Economic in Pietermaritzburg as a result of instituting costing workshops that were used to assess the cost structure of this category of farmer. Finally, the data for Project Grow farmers have been developed by the Sappi Forest division in Pietermaritzburg, in conjunction with the Lima Rural Development Foundation, also located in Pitermaritzburg. The cost data for this category of grower, included a sample size of 64 hectares of growers within a fifty kilometre radius of the Sappi-Saiccor mill. This category of data may have certain limitations as a result of not recording every Sappi Forest cost in relation to the project In many instances, additional Sappi Forest overhead costs could possibly be traced to the project

Further qualitative data were collected on a number of field trips that were conducted between June and December 2001. The data were either located in the written records of the companies or by way of interviewing the respective company officials The researcher was required to enter into a secrecy agreement with Sappi Limited due to the highly competitive nature of the Timber industry Finally, the researcher was authorised to obtain and use this data and the completed case study has been reviewed by the management of the Sappi Limited Company

6.3.2 The Company

Sappi-Saicor, situated at Umkomaas on the south coast of Kwazulu-Natal, is a Sappi Limited company in the Sappi Forests Products division. Saiccor, acquired by Sappi Limited in 1988, provides the group with a pulp revenue stream which hedges the pulp purchases of the global fine paper business. Sappi-Saiccor is one of the world's leading producers of rayon grade dissolving wood pulp. The company was founded as a joint venture in 1953 and commenced production in 1955 The founding partners were Coutaulds, SNIA of Italy and the Industrial Development Corporation of South Africa The production of dissolving pulp has increased from 40 000 tons in 1956 to the current level of 560 000 tons in 2001. The capacity of the mill is 1600 tons of pulp per day and the related timber volume processing capacity is 6000 tons per day A portion of the production process has been subcontracted in order to reduce the level of fixed cost and induce capacity flexibility. The mill dispatches pulp on a continuous basis to Durban where on average three vessels a week leave for different continents

Sappi-Saiccor exports over 99% of its products to customers in Western Europe, the Americas and the Far East. The company currently employs a 1000 people and operates on a continuous three shift system for 365 days per annum Plant and equipment is valued in excess of R5 billion at current cost. Sappi-Saiccor has, recently, made sizeable investments in research and development facilities and staff The company has maintained good margins despite recent decreases in both the volume and price of cellulose markets that have reduced production by 100 000 tons during 2000 1 Demand for Saiccor's products is expected to remain under pressure, however, the mill's low cost structure is expected to keep the company competitive. In 2000 1 Sappi-Saiccor generated sales of R2.85 billion and contributed R1.16 billion to operating profits out of net operating assets of R1.32 billion. This performance resulted in a return on operating assets of 88%, a net profit margin of 40.7 % and an asset turnover of 2.16. An important company strength lies in the company's control over it's own raw material supply with over 75% of hardwoods processed being grown by the Sappi Forest Division and the balance obtained by specification contracting.

6.3.3 The Growers

Three principal categories of grower supply timber to the Sappi-Saiccor mill These growers include the plantations of the Sappi Forest division, medium to large contract growers and a managed smallholder scheme. Sappi Forest Division oversees the production and delivery of all timber to the Sappi-Saiccor mill. Sappi Forest, as a grower, owns and manages 500 000 hectares of plantations in Southern Africa that primarily grow eucalyptus and softwoods. The forestry division consists of the regional growing operations in South Africa that include Natal, Zululand, the Highveld and the Lowveld. The second category of grower consists of medium to large scale contracted farmers. This category of farmer can generally be classified in terms of a medium to large size family farm with an area under timber in excess of fifty hectares These farmers are generally involved in a number of agricultural sectors including timber, sugarcane, tea and fruit. These growers are largely autonomous with respect to the growing of timber but the felling and delivery operations are controlled and co-ordinated by Sappi Forest Division. The third category of grower includes managed small-scale farmers incorporated in Sappi's Project Grow program This category of grower, occupying an average of 0.6 hectares, is, mostly located within a one hundred kilometre radius of the company mill. Project Grow is a tree farming scheme that has the objective of converting subsistence farmers into emerging commercial operations This project was launched in 1983 by Sappi Forests, the Gencor Development Fund and the Kwazulu Department of Agriculture and Forestry with a view to developing viable small scale timber operations in rural Kwazulu-Natal. Since 1989, Sappi Forest division has contracted out the management of this project to a rural development organisation called Lima which is an NGO registered under Section 21 Project Grow now involves over 7000 growers occupying 4223.8 hectares and Sappi Forest Division has invested in excess of R10 million in Project Grow in terms of loans and an additional R5.2 million for seedlings.

The Sappi Project Grow arrangement provides small farmers with financial assistance, seedlings, technical advice and a guaranteed market. Sappi Forest provides an interest free loan of up to a maximum of R2700, calculated on a per hectare basis, for farmers to establish trees where all contracts have the approval of the local tribal authority

Thereafter, advances are paid out to the farmer for completed certified work over the growing period of the trees to ensure that operations are funded over the growing cycle The extension officers visit the growers frequently after the trees have been established to provide further assistance with weed control and the preparation of fire breaks Sappi Forest, if requested by the growers, may also assist during negotiations with harvesting and transport contractors. A majority of the small-scale farm workforce is made up by female household members where many of the men are migrant workers At the time of harvesting Sappi Forest buys the timber from the farmers at a market related price less the advances paid out during the growing period.

6.3.4 Organisation Structure of Timber Supply

The continuous production of dissolving pulp requires a detailed level of co-ordination to synchronise geographically dispersed grower supplies with the high cost processing facilities. The co-ordination, illustrated in Table 6.3, indicates the integrator's choice of governance form on a continuum of structures suggested by Petersen and Wysocki (1997; 1998). In this case, the integrator co-ordinates 50% of timber supply by way of the fully integrated company plantations and 50% by way of a detailed specification contracting arrangement that allows the integrator to control the growing-felling of contracted timber operations. The organisational structure thus incorporates a combination of full integration and specification contracting.

Table 6.3: Organisation structure: Timber Supply

	Spot Market	Specification Contracting	Strategic Alliance	Formal Co-operation	Full Vertical Integration
Level of managed co-ordination	0%	Low	Intermediate	Int high	High
Actual Governance Form		1. Contract Growers 50%			2 Company Estates 5

Based on Chapter Three: Petersen and Wysocki (1997, 1998)

The growers in the Sappi-Saiccor timber supply operations have various categories of land tenure arrangements. The company holds freehold title to its timber plantations as do the medium-large growers in the supply chain The land tenure

governing small-scale farm production is largely regulated by communal tenure arrangements implemented and controlled by tribal authorities. The Tribal authorities have access to the land as defined by the Proclamation R 188 of 1969 where land access is usually by virtue of membership to a community and not through sale, lease or rent (Klug, 1996).

6.3.5 Supplier Contract

All suppliers must enter into a timber purchasing agreement with Sappi Forests (Pty) Limited. The purchasing agreement specifies the exact location of the grower as well as the commencement and duration of the relationship. The agreement indicates the total tonnage to be delivered to the mill during the period of the contract and also stipulates the annual tonnage. The contract specifies the price that the company will pay for the tree species to be delivered or alternatively that the parties shall agree to an annual price. The supplier must adhere to quality specifications as determined by the company mill. The supplier is required to obtain the necessary permits, license or statutory authority from the Department of Water Affairs and Forestry, the National or Provincial Environmental Authority and the Department of Agriculture The conditions of delivery, risk, ownership and payment are outlined in the contract with the risk only passing to the mill once the specified timber has passed over the company weigh-bridge. The date and mode of payment for timber delivery is also specified The company undertakes to supply seedlings, free of charge, on condition that proper notification is given by the supplier and that transport costs are to be borne by the supplier. The company also undertakes to provide free technical advice during the growing cycle of the timber, however, the supplier must provide reasonable notification to the company and access to the growing site. A clause is inserted to cover both parties from a "force majeure " and outlines the terms and conditions of the suspension or waiving of contractual liabilities. The enforcement of the contract is stipulated by way of written notice to the defaulting party and the supplier may not sub-contract or cede any of the terms and conditions of the agreement to a third party Finally, the contract specifies the domicilia of the parties and outlines further miscellaneous legal clauses to the purchase agreement.

In certain cases, suppliers enter into a financial assistance agreement with Sappi Forests. This agreement, called a MAP Agreement 1, stipulates the background of the applicant, the duration of the arrangement and an exact schedule of the growing and harvesting of specific species of trees. This agreement, moreover, stipulates the rate of interest to be paid to the company together with notification of a liability for finance charges. The terms of repayment are specified by way of a deduction of the financial assistance received from payments made with respect to the supply of timber under the timber supply agreement. Furthermore, the conditions that apply in the event of the non supply of timber to the company, for whatever reason, are outlined in this agreement The supplier, applying for financial assistance, should be the registered owner of the stated property, and, if a loan in excess of R 50 000 is made, then the supplier is obligated to register a covering mortgage bond in favour of Sappi Forests In certain cases where the supplier plants in excess of 500 hectares the company may enforce a timber servitude on the supplier as an additional measure to enforce the contract. The contract, moreover, stipulates the general obligations of the supplier and includes conditions that enforce the supplier to comply with all environmental and silvicultural requirements. The contracted supplier, moreover, must sell the specified timber to Sappi Forests when the trees are at a specific age at a market related price relative to the area in which the mill is established. The MAP Agreement 1 includes the provision of free technical advice to the supplier up to a stated number of visits per year and outlines the risk-insurance requirements to be met by the grower who shall forward a copy of the insurance agreement to the company. The agreement, furthermore, outlines the conditions relating to the breaching of the contract, death or insolvency as well as stipulating that the supplier shall not be able to transfer any rights to third parties Finally, the agreement stipulates the domicilia of the parties and outlines further miscellaneous legal clauses.

A different supply arrangement is used to contract small-scale farmers under the Project Grow arrangement. The Grow Agreement requires the contracted grower to have permission to occupy the land from the tribal authority that contr ls the said property and involves an arrangement whereby the supplier is supported both financially and technically by the Sappi Forest division The duration of the arrangement is specified and the terms of assistance outlined. Assistance is received in the form f an

initial interest free loan for planting, maintaining and weeding the timber Sappi Forests also undertakes to provide seedlings free of charge The grower must demonstrate they have all the necessary permits, licences and authority to grow timber on the said property including the compliance of the Department of Water Affairs, the National Provincial Environmental Authority and the Department of Agriculture The grower undertakes to meet a range of obligations that include compliance with Sappi Forests environmental and silvicultural practices and access to inspection by all stipulated parties. The grower is obligated to sell the timber to Sappi Forest and this timber must comply with the stated mill specifications The supplier must also comply with Sappi Forest's instructions to harvest the timber at a specific age which in the case of eucalyptus ranges between eight and twelve years The price paid for timber is negotiated between the parties and will generally be the prevailing price All risk of damage remains with the grower until it has crossed the weigh-bridge although the timber that does not meet mill specifications may be rejected The agreement, furthermore, cedes the grower's rights to the purchase price as a measure to provide additional security to the company. Finally, the contract outlines the conditions relating to the breach of the contract by the grower and the manner in which the contract will be enforced. The grower is not allowed to cede any rights or obligations to third parties and all notices to the grower are to be delivered personally by the company or at monthly Project Grow meetings

6.3.6 The Transaction Characteristics of the Supply Chain

The interface between growers and the company mill, with respect to the continuous supply of large volumes of timber, generates a unique set of transaction characteristics The number of deliveries of timber to the mill has been used to demonstrate the transaction characteristic of frequency whilst the replacement value of the Saiccor processing plant has been used as a measure for the level of asset specificity Finally, a qualitative analysis of the conditions of supply has been used as a basis to estimate the level of supply uncertainty. The actual Sappi-Saiccor timber supply transaction characteristics, illustrated in Table 6.4, were developed for the period 2000 1 and are based on the delivery of over 1.6 million tons of timber to the Sappi-Saiccor timber yard.

6.3.6.1 Transaction Frequency

The Saiccor plant processes approximately 6 000 tons of timber per day that are delivered by a continuous stream of 125 road-rail trucks. Because of the perishable nature of wood chips the timber supply yard needs to be replenished on a daily basis In 2001, some 46 669 truckloads of timber resulted in the delivery of 1 663 520 tons of timber involving 1 489 203 tons of gum and 174 317 tons of wattle The transaction characteristic of frequency, on the basis of this large number of deliveries, has, therefore been graded as high.

Table 6.4 : Timber Supply Transaction Characteristics

Transaction Characteristic	Sappi-Saiccor
1. General	
Types of Growers	Estate, Large, Medium, Small, Micro
Hectares	500 000 hectares
2. Frequency	High
Tonnage Crushed	1.64 million tons
Number of Deliveries	46669
Administration	5.3 tons transaction
3. Asset Specificity	High
Co-ordination Level	12 months year/24 hrs day 7 days week road-rail, wood chips perishable, mill requirement 6000 tons day
Value of Estates	> R 3.8 billion (net operating assets)
Value of Plant	> R 5 billion (replacement cost)
4. Uncertainty	Low-Moderate
Company Estates	Legislation, environmental issues, cost of inputs, physical variables, land constraints
Medium-large Growers	Timber Prices, physical variables, limited additional land, water cost, environmental
Small-scale Growers	Different time horizons, land tenure, cost of inputs, legislation, lack of access, moral hazard, theft
Processing	High Degree of leverage

6.3.6.2 Asset Specificity

The net operating assets employed are currently valued at R 1 3 billion, on a historical cost basis, that translates into a current replacement cost in excess of R5 billion for the year ending September, 2001. These assets are highly specific and have a low opportunity cost outside the timber industry. The assets, moreover, are relatively immovable and are also site specific as the they have been located in close proximity to certain suppliers, harbour, rail and road facilities. The finished product is largely exported by ship and therefore the mill is site specific to the coast and harbour facilities The high level of co-ordination required to synchronise the use of plant capacity and timber deliveries, combined with the perishable nature of wood chips, further elevates

the levels of asset specificity. Conversely, the asset specificity of the contracted growers is much lower. The medium-large growers are, mostly, also involved in the production of other commodities and their assets are of a general farming nature The small-scale growers own few assets and contract out for activities that require the use of capital assets.

6.3.6.3 Uncertainty of Supply

The uncertainty of supply has, historically, been relatively low due to a number of factors. Firstly, the uncertainty of supply has been reduced by the monopsonistic nature of the timber industry where Sappi Limited is a major player Secondly, the company estates have, historically, produced more than 50% of the timber processed by Sappi-Saiccor and uncertainty of supply is further reduced by the site specificity of many growers who are located within a fifty kilometre radius of the Saiccor Mill Thirdly, uncertainty is reduced by the long term nature of timber production Sappi Forest division is, in this regard, able to manipulate the supply of timber according to annual mill requirements and standing timber can, therefore, be felled if required or maintained until a future time when it is required. The economic viability of the standing timber is not affected due to the annual growth rate of this commodity.

A number of potential threats may contribute towards higher levels of timber supply uncertainty in the future. The problems of obtaining water licenses for small-scale growers, in particular, are compounded by the fact that this category of farmer is in the process of expanding the supply of timber to the Sappi-Saiccor mill The uncertainty regarding the issue of water permits has been further compounded by the proposed price increase of water, in conjunction with, the payment of a levy A further factor creating uncertainty is the increased regulation regarding environmental standards Small-scale farmers, again, may be confronted with higher levels of constraints in this regard. Adding to this list of concerns, the proposed property rates bill is an additional source of uncertainty that could effectively reduce the profitability of timber growing Other factors increasing uncertainty include labour market legislation, a deterioration in infrastructure and services, a reduction in government research, the impact of AIDS and the future cost of transport, capital equipment and insurance In addition to these

constraints supply uncertainty is influenced by the different time horizons of the small-scale grower versus the mill, the problems surrounding the land tenure issue, the gender factor and the deteriorating security situation in many of the rural areas Finally, factors that further contribute towards higher levels of uncertainty include high levels of theft, difficulties in accessing the property, impassable roads during the wet season, fire damage and a moral hazard factor that could result in the farmer selling his/her timber to the nearest available market. As a result of these factors the current level of Sappi-Saiccor supply uncertainty has been classified as low-intermediate

6.4 Do Transaction Characteristics Influence the Organisation Structure of Timber Supply ?

The process of matching the transaction and contract characteristics of the Sappi-Saiccor operation with an optimal structure employs the same transaction cost theory approach that was used in the sugar case study. Transaction cost theory proposes that the governance structure of the timber supply operation will be a function of its transaction characteristics and that the firm will evolve over time to minimise transaction cost (Coase, 1937). The case study has, therefore, classified and graded the timber supply chain characteristics of frequency, asset specificity and uncertainty, as well as a list of contract conditions. The contract conditions that particularly influence the governance structure of the timber supply operation include the ability to walk away from the contract, the availability of substitutes, the degree of identification of the parties, the duration of the contract, the level of ex ante control and ex post importance, the level of shared information and the ability to enforce the contract.

In Table 6.5, a set of graded transaction and contract characteristics (1-5) are matched with suitable governance forms in accordance with the conceptual framework developed in Chapter Four. The details and grading of the actual transaction (b) and contract characteristics (c) of the Sappi-Saiccor timber supply operation have been developed in Section 6.3.6. The transaction characteristics (b) indicate a high level of frequency (5) asset specificity (5) and a low-intermediate level of uncertainty (2) Transaction cost theory would indicate that these transaction characteristics are best managed in a

governance structure that ranges between specification contracting (2) and full vertical integration (5).

Table 6.5 : Matching Transaction Characteristics with the Level of Managed Control

Vertical Co-ordination Continuum / Variables	1. Spot Market	2. Specification Contracting	3. Strategic Alliance	4 Formal Co-operation	5 Full Vertical Integration
a) Sappi-Saiccor Structure		50% Contract Growers			5 % Company Plantations
b) Transaction Characteristics	1. Low	2. Low-Int.	3.Intermediate	4. Int high	5 High
Frequency					Saiccor 4 9
Asset Specificity					Saiccor R 5 bill
Uncertainty		Saiccor			
c) Contract Characteristics	1. Classical	2. Classical-neo classical	3. Neo-classical	4. Neo-class Rel.	5 Relational
Level of Control	Low external	Higher external	Saiccor 50%	Hierarchy	Saiccor 5
Ability to walk away	High	Saiccor 50%	Less	Low	Saiccor 5
Substitutes	Yes	Lower level	Less	No	Saiccor 1
Parties have own identity	Yes	Saiccor 50%	Yes	No	Saiccor 5
Duration	Short	Longer	Saiccor 50%	Long	Saiccor 5
Ex ante control	High	Lower	No	No	N
Ex Post Importance	Low	High	Saiccor 100%	High	High
Information Shared	Low	Higher	Saiccor 100%	High	Extensive
Enforcement	Legal	Legal-complex	Saiccor 50%	Hierarchy	Saiccor 5(

Based on : (Williamson, 1975; 1981; 1986; Mahoney, 1992, Petersen & Wysocki, 1997, 1998, Sartorius & Kirsten 2002

Similarly, the actual contract characteristics (c) appear to suggest that Saiccor exercises a high level of managed control over the growers, the parties have a limited ability to walk away from the contract, there are no substitutes and the contract endures over a minimum of ten years. Additional conditions indicate a high level of shared information and a high level of ex post importance. Collectively, the actual contract conditions would be optimally co-ordinated in a relational contract structure that is best accommodated by a governance structure that ranges between specification contracting and full vertical integration. The actual governance form (a) of the timber supply operation indicates that 50% of supply is secured by way of specification contracting (contract growers) and 50% by full vertical integration (company estates) The choice of the actual governance structure, therefore, supports the conclusion that the actual transaction-contract characteristics match a governance form that ranges between specification contracting and full vertical integration This conclusion supports the body of literature that concludes that the spot market is unlikely to be as synchronised as contracting with respect to ensuring the continuous supply of a uniform quality raw

commodity (Glover, 1984; Kilmer, 1986;Glover, 1994; Mahoney, 1992, Hennessy, 1996; Azzam, 1996). The annual purchase and delivery of 1 66 million tons of timber to the Sappi-Saiccor mill, if it were possible on an open market basis, would result in the need to significantly expand the procurement department of Sappi-Saiccor resulting in higher levels of classical contracting cost and an increase in purchasing overhead costs The high cost asset specificity of the processing operations, moreover, could result in undue supplier opportunism that would place the processor in an untenable bargaining position. The presence of Mondi and other rival processors would further exacerbate supplier opportunism. Moreover, Sappi-Saiccor would be unlikely to co-ordinate, on a real time open market basis, the purchase and delivery of 6000 tons of timber per day on a twenty four hour basis. On the basis of the results, this study suggests that the transaction characteristics of the grower-processor supply chain have influenced the minimum, rather than maximum, level of managed co-ordination Finally, the results confirm the overwhelming empirical evidence of the relationship between governance structure and transaction characteristics as demonstrated by the literature (Masten, 1996 Williamson, 2000).

6.5 Do Historical Legacies influence Transaction Cost in the Timber Industry ?

The prevailing institutional framework within which the timber industry in South Africa operates is, in many instances, similar to that of the sugar industry The question remains, however, the extent to which transaction cost in the industry is influenced, as well as the ability of this sector of the economy to economise some aspects of the institutional cost.

6.5.1 The Institutional Framework

Similar aspects of the institutional framework that confront both the timber and sugar industries include human behaviour, the equity objectives of government-founders regulation, land tenure issues and the bureaucracy cost of national local government Other similar features include the impact of the macro-economic environment and the influence of natural resources. Certain features of the prevailing institutional framework confronting the timber industry, however, are unique. They are.

The location and concentration of the timber industry, in many instances, required the joint support of foreign investment and the South African government The Saiccor operation, for instance, was initiated by the Industrial Development Corporation and the multinational Coutaulds of Italy in 1953. These investments have contributed to the present current value of plant and equipment (R5 bill), human capital and infrastructure that are all specific to the timber industry Earlier regimes of the South African government simultaneously ensured the provision of infrastructure, harbour facilities, services and subsidies to assist the development of the industry In a similar fashion, a few other players in the industry were selected, located in suitable natural conditions and nurtured in a similar fashion. In many instances, moreover, the founders of this industry had wide ranging equity and economic objectives that included high levels of investment in local communities. Currently, the monopolistic nature of the timber industry and the current structures constitute a major barrier of entry to new entrants

The availability, location and efficiency of both local and central government structures has, particularly, influenced the economy of the timber industry Recently, local government inefficiencies have particularly delayed the authorisation and expansion of small-scale farming projects in the timber industry. The timber industry is also confronted by a deterioration in rural infrastructures due to a lack of investment and is increasingly incurring incremental cost to maintain local roads and state owned facilities These problems, combined with fiscal constraints and the problematic integration of the security force and police, are thought to have contributed to an increase in rural security problems including an upsurge in crime, arson and insecurity

The long term macro-economic influence on the timber industry is a result of decades of local and international economic, fiscal and monetary policy Currently, there is reduced demand in world markets for dissolving pulp, due to international supply configurations This reduced level of demand has caused a 25 % (100 000 tons) contraction in the use of Sappi-Saiccor capacity and demand for this product is expected to remain under pressure in the immediate future.

6.5.2 The Influence of the Institutional Framework on Transaction Cost

The transaction cost for new entrants to the timber industry has been elevated as a result of the barriers of entry that have been created as a result of historic legacies promoting the original concentration of the industry. In many instances new entrants are forced into marginally productive areas that are further away from processing facilities Government, moreover has limited capacity to establish infrastructure and services in these areas adding to the transaction cost of entrants. The deterioration of roads, the limited availability of suitable land and locations, the deteriorating security in rural areas and the quasi monopoly position of the timber industry, have all contributed towards higher levels of transaction cost for both new and existing players in the timber sector The equity objectives of the original founders of the timber industry have also contributed towards the current level of transaction cost. In many instances, the timber industry maintains local community infrastructure and services An estimated R 80 million per annum is spent by the timber industry to maintain roads-infrastructure, provide housing and for the provision of healthcare.

The application for water use rights, based on the Water Act of 1998, requires repeated visits and multiple permission from a plethora of authorities. Start-up transaction costs for new entrants, especially small-scale growers, are further exacerbated by long delays and the inefficiency of local government structures. The application procedure, in this regard, is delayed by the need to satisfy traditional authorities, the Department of Water Affairs, The Department of Environmental Affairs, the Department of Agriculture and certain wildlife and cultural heritage bodies. Other institutional framework variables influencing transaction cost include the problem of AIDS, the withdrawal of government from research, depressed international demand for dissolving pulp and natural resource constraints in Southern Africa. It is expected that the timber industry will incur higher levels of labour cost, including medical expenditure as a result of AIDS for an estimated 135 000 direct workers and their two million dependants

The influence of the prevailing institutional structure and existing property rights economics on the transaction cost of the timber industry complements the experience of the Southern African sugar industry as discussed in the previous chapter On the basis of

the results of the results of the case study there is strong evidence to suggest that specific institutional variables, that are the result of historical legacies, have influenced the transaction cost of the timber industry. The relationships between transaction cost and the existing institutional framework further support the conclusion of Williamson (2)0( ) and promote the suggestion that the timber industry should attempt to customise its environment in order to reduce cost. The industry is a major player in the economy and has the potential to lobby government with respect to regulation-property rights economics, favourable policy to reduce the cost of inputs, subsidies and reduced taxation-interest charges.

6.6 Do Smaller Farmers Generate Incremental Transaction Cost ?

Agribusiness transactions in the timber supply chain include start-up costs, technical advice, the use of inputs, cane supply-delivery transactions and the administration of the suppliers in the company's financial accounting system.

6.6.1 Start-up Transactions

In the case of medium and large scale suppliers, the start-up transactions largely revolve around the registration of the supplier contract. The process whereby a farmer, with a water license, applies to enter into a purchase agreement with Sappi Forest division begins with an application made by the farmer on the prescribed form. The evaluation of the application is initially done by the project manager before being further evaluated by the regional project manager. The application will then be forwarded to the resource manager of Sappi Forest who will approve or reject the application If the application is rejected a response will be directed to the farmer applicant If the application is approved it is re-directed to the project manager who will then ensure all the applicant's back-up data is obtained and the contract details are completed. The application is then forwarded to the contracts manager who checks the details and draws up the contract The outline contract is then forwarded back to the regional project manager who checks the details, obtains the applicant's signature and forwards the signed document back to the contracts manager who prepares the final agreement pack A copy of the agreement pack is then forwarded to the resources manager who inspects before passing n t the

logistics manager who, in turn, will forward to the environmental manager before returning to the contracts manager. Finally, the contracts manager will then forward the agreement pack to the fibre supply manager who will direct it to the managing director for approval. The agreement pack is then forwarded to the Sappi Division Board for final approval. Only then will the contracts manager instruct the conveyancers to register a bond and timber servitude on the newly contracted grower The conveyancers will then register a bond and timber servitude with the deeds office whereupon the contracts manager will inform the resource manager, the project manager and the planning department. Some ten transactions are incurred by Sappi Forest in order to register a contract for medium-large growers in possession of a water license Only at this stage will an advance be made by Sappi Forest division with respect to the establishment and growing costs of the prospective grower.

The start-up transactions for Project Grow farmers involve a number of incremental transactions. The registration of these growers is managed by LIMA, a rural consultant organisation, hired by Sappi Forest division to manage the affairs of the small-scale growers. The contracting procedure commences with an application for a water licence An application form is filled in for the tribal area and the signature of the relevant tribal authority is obtained. The growers are then canvassed and a site visit is conducted, per grower, to evaluate the physical aspects of the site. A geographical position system (GPS) then takes a reading of the site co-ordinates and an estimate is made of the plot size. The grower application form is then completed and grower information is captured on the database system. This data is then transferred to an Excel type spreadsheet that is maintained for Project Grow. The farmer data is then forwarded to Sappi Forest for processing and Sappi Forest who then directs this information to the various authorities including the Department of Water Affairs (DWAF) , the Department of Environmental Affairs (DEA), the Department of Agriculture (DOA), the Kwazulu-Natal Wildlife and the AMAFA, a cultural heritage body. The application procedure by small growers on non- title land for a water licence thus requires a multiple application approach in order to satisfy the requirements of the National Environment Act 107 of 1998, the Environment Conservation Act 73 of 1989, the Kwazulu-Natal Heritage Act 10 of 1997 and the Conservation of Agricultural Resources Act 43 of 1983 LIMA, moreover, interacts with some thirty eight different tribal authorities, with respect to the

registration of new growers in the Project Grow area Once the water license has been granted, LIMA checks the recorded data of the applicant, including the GPS co-ordinates of the new grower site, before confirming this information with Sappi Forest Division and commencing the contract registration process. The contract registration process for Project Grow farmers then follows the same procedure as for larger growers The registration of a water license and the contract approval procedures involves some thirty transactions.

The start-up transactions for Project Grow suppliers exceed those of larger contract farmers for two reasons. Firstly, an incremental twenty transactions are incurred by Sappi-Lima to ensure the new grower has access to water rights and has the right to operate on traditional land. These transactions extend to a number of local and national authorities. Secondly, in terms of administration cost, the screening and registration of small-scale growers involves the same level of resources as larger growers On the basis of the volume of transactions, small-scale start-up costs, in terms of administrative effort, are in excess of 300% more costly than larger growers. The incremental nature of small-holder start-up cost is further highlighted if this cost is levied against the actual tonnage of the individual grower.

6.6.2 Planting and Growing Transactions

Medium and larger farmers are largely autonomous with respect to the growing of timber. Sappi Forest division is available for consultation and the fibre supply department, in particular, normally physically evaluates the contracted timber These transactions are largely on an ad hoc basis however. Conversely, small-scale growers generate a high number of integrator-grower transactions. After the acquisition of a water license, the approved small-scale farmer is visited with a view to training them to prepare planting pits. After the necessary rain, seedlings, supplied free of charge by Sappi Forest, are transported to the sites together with fertiliser The planting of seedlings then commences and a follow up visit is made by LIMA to assess the results LIMA then processes a loan advance and a cheque is prepared per farmer for work done These loan advances are batched by LIMA and forwarded to Sappi Forest for

authorisation. Sappi Forest then inspects this request and deposits the funds into a trust account.

The cheques are then distributed to the farmers who individually sign for them A further GPS reading is taken to verify the co-ordinates of all the planted sites that have been initiated for the year and the results again forwarded to Sappi Forest for record keeping purposes. Each grower is visited at least twice per year and this increases to six transactions in the planting phase. Sappi Forest then also conducts annual grower audits and their extension officers frequently visit the growers after the trees have been established to provide assistance with weed control and the preparation of fire breaks Some 800-1000 new sites are approved per annum. Lima also purchases fertiliser and chemicals and dispenses these from five different locations in the Project Grow area Table 6.6 lists the Lima-Grower transactions for gum production These transactions, generated by Lima's management of the planting and growing process, include all the technical, management and extension services offered to growers. The number of transactions have been calculated on the basis of 6 visits per farmer per year for the first year, 3 visits per farmer in the second year and 2 visits per farmer per year between years 3 and 8. The results indicate that micro-farmer transactions have increased from 600 in 1989 to 15 000 in 2001.

Table 6.6: Planting-Growing Transactions

Year	New Growers (G)	1st Year G x6	2nd Year G x3	3rd Year G x2	4th Year G x2	5th Year G x 2	6th Year G x 2	7th Year G x 2	8th Year G x 2	Total
1989	101	606								
1990	344	2064	303							23 7
1991	273	1638	1032	202						2872
1992	354	2124	819	688	202					3833
1993	243	1458	1062	546	688	202				39 6
1994	234	1404	729	708	546	688	202			4 77
1995	549	3294	702	486	708	546	688	2 2		6626
1996	778	4668	1647	468	486	708	546	688	2 2	413
1997	656	3936	2334	1098	468	486	708	546	688	1 2 4
1998	862	4436	1968	1556	1098	468	486	7 8	54	1 2
1999	764	3692	2586	1312	1556	1098	4 8	486	7(8	11 6
2000	1085	5154	2292	1724	1312	1556	1098	4 8	486	14 90
2001	857	4598	3255	1528	1724	1312	1556	1 98	4 8	155 9
Total	7100	39072	18729	10316	8788	7064	5752	4196	3 98	97 15

Table 6.7 indicates that the total number of growers increased from 101 to 71 0 in the period 1989 to 2001. The number of planting-growing transacti ns per t tal farmer

decreases from 6 to 2.2 in the period 1989 to 2001 This is because the average age of the plantations has increased and the average number of visits for plantations between the age of three and eight years is two per annum. Similarly, the transactions per hectare per annum decrease from 9.1 to 3.7 in the period 1989 to 2001 as the average age of the plantations increases.

Table 6.7: Smallholder Transactions Per Hectare

Year	Cumulative Farmers	Cumulative Hectares	Transaction per Farmers per year	Transactions per Hectare per year
1989	101	66.5	6	9 1
1990	445	284.6	5 3	8 3
1991	718	417.8	4	6 9
1992	1072	560.9	3 6	6 8
1993	1315	693.8	3 0	5 7
1994	1549	828	2 8	5 2
1995	2098	1040	3 1	6 4
1996	2876	1449.7	3 3	6 5
1997	3532	1934.2	2 9	5 3
1998	4394	2537.2	2.6	4,4
1999	5158	3075.5	2 3	3 9
2000	6243	3648.7	2 3	3 9
2001	7100	4223.6	2 2	3 7

Once plantations are older than eight years the first coppicing cycles begin which further ensures that farmer visits are restricted to around two per annum In 2001 over 18 000 tons of timber were delivered by Project Grow to the Saiccor Mill In 2001, Lima incurred some 15 500 planting-growing transactions with the contracted smallholders. This high level of interaction translates into 3 66 transactions per hectare per annum. Conversely, the number of Sappi Forest division transactions per hectare for private commercial growers per annum is less than one. This would indicate a transaction cost differential in excess of 350% for company transactions involving small-scale suppliers as opposed to private commercial farmers

6.6.3. Felling-Delivery Transactions

Harvesting operations for all growers commence when an order for timber is issued by Sappi-Saiccor mill. In response to this order a harvesting plan is drawn up by the Sappi Forest procurement office who then releases a procurement order for a specific tonnage of timber to be delivered. A sourcing meeting is conducted to identify the growers that will respond to the procurement order and to ensure the available timber is managed in a

sustainable basis. The order is split up into an amount to be supplied by own growers (SAPPI plantations) and contracted private growers A questionnaire is sent out to the private growers and Project Grow and this is returned to the procurement manager indicating the growers who will comply with the order and the respective tonnage to be delivered. A list of own growers and tonnage is then produced by the regions, as well as, a list of private growers and tonnage. These lists are then discussed in a monthly meeting and checked with the conditions of the respective supplier contracts before the suppliers are notified to proceed. Sappi Forest will, moreover, indicate how it would prefer the timber to be delivered and for every order the supplier will indicate the split between the timber to be transported by road and rail respectively The procurement office is now in a position that it can verify exactly what quantity of timber will be supplied by each grower, both own and private-project grow. This delivery schedule will then be forwarded to the mill manager and the timber control system department (TCS), operated by Sappi Forest division, will then initiate the printing of timber labels for each of the designated suppliers. Each label includes the full supplier details for accounting purposes and timber labels are printed for the expected tonnage Sappi's own timber is allocated a label for every five tons

Timber deliveries can be categorised as road deliveries from own plantations, rail deliveries from own plantations or rail and road deliveries from private growers In the case of road deliveries from own plantations, the haulier retains a copy of the label as does the loading contractor and the barcode on the label is scanned by the weigh-bridge on arrival at the mill. In the case of rail deliveries from own plantations the supplier retains a copy of the label which is attached to the railway consignment note which, in turn, is placed in appropriate holders in the railway trucks At the mill the weigh-bridge clerk removes the consignment note and scans the label and attaches the consignment note to the weigh-bridge ticket. A similar procedure is followed for larger contract growers delivering timber by road and rail. In the case of road transport a bar-code slip is issued by TCS per truck load and private suppliers must ensure that drivers hand in the label to the weigh-bridge for scanning on arrival The procedure by rail for this category of grower is the same as own deliveries by rail The TCS payment system is based entirely on the information contained on the labels adjusted for any deductions with respect to loans. Suppliers are monitored on a weekly basis using the TCS rep rt

that checks actual volumes received compared to the volume indicated in the order generated by the procurement process. A month end remittance advice is prepared for each supplier, checked and authorised for payment. Any deductions, for loans and advances to the suppliers, are netted off against the timber payment after being calculated and checked by the regional project manager who initiates the deduction from the payment system. The deduction is also verified by the procurement manager and the resource manager before being passed on to the TCS department for processing in the month end remittance advice.

The harvesting of timber for Project Grow is differentiated from that of larger growers as follows. Prior to harvesting a field check by Lima is done to ensure the quality of the selected trees. Lima is also responsible for organising the felling and transportation of Project Grow timber. The services of a harvester, a shorthauler and a transporter are negotiated with each grower before contracts are entered into with the respective agents. Sappi Forest officials, if requested, also assist the negotiation of contracts with harvesters and transporters. Where access roads are required a survey of the roads is performed and, if viable, a contractor is hired to make roads and the cost is split between the growers whose income can be reduced by 50%. The harvesting and haulage of timber to the Sappi-Saiccor Mill is managed by LIMA who schedules the dates and quantity of timber to be harvested with every farmer on the basis of a harvesting schedule that is developed at the start of every season. Weigh-bridge tickets are issued weekly from Saiccor. The tickets are collected and checked by LIMA with respect to their number and sequence.

The procedure for timber to be delivered involves an extension officer performing the following checks. Firstly the farmer records are checked on the database before LIMA oversees a contract between the farmer and an approved contractor. This contract is handed in to LIMA before the issue of any weigh-bills by the extension officer to the grower who signs for them on receipt. These weigh-bills are only issued to approved contractors vehicles. The grower hands over the weigh-bill to the contractor for each load taken and where possible this load is verified by a LIMA official who will initial the weigh-bill. At harvesting a weigh-bill docket is issued per load to a farmer and the weigh-bills issued on a weekly basis by the Sappi-Saiccor Mill are collected

The payment of all contractors and farmers is based on the timber delivered over the weigh-bridge and this payment is performed weekly for all the plots where harvesting and delivery to Sappi-Saiccor has taken place. Sappi-Saiccor mill also mails LIMA a full history of monthly weigh-bridge records. A monthly repayment of Sappi Forest loans to Project Grow farmers is made by way of a cheque to Sappi Forest that reconciles the total amount paid with the individual farmers All this information is captured on the LIMA database. Additional transactions are occasionally generated as a result of the inclusion of non-contract timber that has been included in Project Grow deliveries to the Sappi-Saiccor Mill. In the future all harvesting-haulage contractors will be screened by means of an interview before their details are filed A monthly harvesting report will also be generated to identify and investigate any abnormal yields and LIMA staff will carry out spot checks in the field.

Project Grow farmers appeared to generate incremental transaction cost in the harvesting operation because of the higher level of supervision that is involved Lima is paid a fixed fee per ton, as part of their annual contract, to manage the harvesting and transport of Project Grow timber. The incremental level of transaction cost occurs because of the need to help farmers contract with harvesting-transport agents and to ensure that the necessary documentation is facilitated Lima also ensures that the selected growers supply, and are paid for, the correct volume of timber and that the necessary access roads are available. By contrast, medium and large scale farmers, largely, do not need assistance from Sappi Forest for this activity and engage and pay for their own contracted services.

6.6.4 Administration Transaction Cost

A sample of growers harvesting-remittance administration transactions have been recorded in the Sappi Forest accounting system (TCS) for the year ended September 2000. The sample consisted of two Sappi estates, Braemar and Sutton, two medium sized growers, P. Hayter and Kevard Estates and a sample of Project Gr w small-scale farmers. The Sutton Estate could be classified as a large grower whilst the Braemar Estate could be classified as medium-large. A record of acc unting transacti ns

generated versus timber delivered is listed in Table 6 8 The transaction cost f administering grower records is reflected in terms of the number of accounting entries that are generated for the tonnage delivered. The records indicate that Project Grow farmers generate the highest level of administration cost per ton followed by the Sappi Forest estates of Braemar and Sutton. Finally, the contracted medium sized growers, namely, P. Hayter and Kevard Estates, generate the lowest level of administration cost

Table 6.8: Grower Accounting Transactions

Grower Name	Classification of Grower	Tonnage Delivered	Accounting transactions	Tons per transaction
Kevard Estates	Small-medium	5633.65	249 + 249 498	11 31
P.Hayter	Small-medium	7487.1	228 + 228 456	16 41
Project Grow	Micro	12805.31	3301	3 87
Braemar Estate	Medium-large	26841.35	740 + 3700 4440	6 04
Sutton Estate	Large	91258.9	3103 + 15515 18618	4 90
Total		**144026**	**27313**	**5.3**

Project Grow farmers appear to generate an incremental administration cost of between 26% and 56% in the Sappi Forest TCS system compared to the Sappi Forest estates of Braemar and Sutton. The incremental cost of Project Grow farmers, however, is even more apparent in relation to contracted medium size growers Project Grow administrative cost exceeds that of the medium growers, namely, Kevard Estates and P.Hayter, by 282 % and 424 % respectively.

In addition to the Sappi Forest TCS system, Lima incurs incremental administration c st with respect to the Project Grow farmers. These costs include the administration of fertiliser and chemical accounts and advances received or loan repayments made LIMA maintains a full time clerk and a half day bookkeeper to work permanently on Project Grow administration requirements. LIMA also maintains a separate database and two bank accounts for the project. Fertiliser and insecticide stock logistics are administered at five separate depots. Records are maintained for each grower on the database system. These records include the grower particulars, the issue of seedlings-fertiliser-insecticide, loan cheques issued, visits made, harvesting rates and contractors and a record of remittances. Project Grow farmers, moreover, receive periodic payments when certain growing activities are completed and individual acc unts are maintained

that track monies owed to or payable by each farmer A bi-annual bad debt survey is also made and each year records of harvested growers are archived The first bank account, namely, harvesting, is reconciled monthly and a record of monthly transactions with contractors and farmers is reconciled with the Sappi TCS system The second bank account, namely, advances, is also reconciled monthly per grower plot number and a monthly reconciliation with the Sappi control figures is performed against the Payment Summary Report. The administration of Project Grow affairs is, therefore partially duplicated and involves the resources of both Sappi Forest division and Lima Conversely, the administration of Sappi plantations and all other contracted growers is undertaken by Sappi Forest division only. Project Grow, therefore, demonstrates a higher level of administrative transaction cost than both the Sappi plantations, Braemar and Sutton, as well as, the medium-large growers, Kevard Estates and P Hayter

6.6.5 A Comparison

The results suggest small-scale growers generate higher levels of transactions cost than larger suppliers. The primary reason for the incremental level of transaction cost is caused by differential levels of start-up cost, growing-felling-delivery costs and the administration of growers affairs. Medium to large contracted growers, largely, self develop their capacity to operate as timber growers whereas the development of the Project Grow program has cost Sappi Forest division in excess of R 10 million This project, moreover, has required nearly a decade of committed inputs Periodic payments have also been made to the growers to ensure the continuity and cash flow of small-holder operations. Smaller growers also generate differential levels of growing costs because of the high levels of visits from Lima officials Larger growers, by contrast, maintain their own timber and are only visited on an ad hoc basis by Sappi Forest division. Larger growers are also responsible for the felling and transport of their timber to Sappi-Saiccor whereas Lima arranges these operations for Project Grow farmers Finally, the administration transaction cost of small-scale farmers appears to be greater than larger growers because of the smaller volume of deliveries allied to greater use of company inputs. On the basis of the results, this study concludes that the managed small-scale growers generate more transaction cost then larger suppliers and that Sappi Forest acquires timber at less transaction cost from larger suppliers The incremental cost of

dealing with smallholders also appears to generate frustration for the Sappi Forest division as a result of the higher level of problems, increasing levels of rural theft and violence and lack of access to certain areas.

6.7 Small-scale Grower Production Efficiency

A range of gum growers were selected in order to evaluate the comparative cost performance of company estates compared to private growers, small farmers and provincial and national statistics. The company estates include the Sappi Forest regions of Umkomaas and Richmond. The cost data used are the result of a benchmarking exercise conducted between 1997 and 2001. The cost data have been restated in terms of 1999 prices and averaged. The cost data for medium size contracted growers include the results of a workshop held in May 2001 where the results of 61 000 hectares of farmland were consolidated. The Project Grow small-scale farmer cost data are the result of an analysis of the performance of 98 farmers between 1991 and 2001 Lastly, general data for Kwazulu-Natal and South Africa, also restated in terms of 1999 prices, have been included for comparative purposes. The growers all supply the Saiccor Mill and are located within a 25-75 kilometre radius of this processing unit

6.7.1 The Financial Analysis of Plantations: Accounting Methodology

Plantation forestry may be seen as a permanent crop with a portion of the plantation harvested each year to generate an annual income that should cover the cost of re-establishment, as well as, the maintenance and overhead expenses of the whole plantation. This study has assumed that each crop is a long term cycle that generates a sustained annual yield, called the mean annual increment, which may or may not be felled. Many factors can cause an imbalance to the years felling program but the assumptions adopted see this variation as effecting cash flow and not the inherent profit potential of the plantation. Under-felling, in any one accounting period, will therefore reduce cash flow for that period whilst over-felling will achieve the opposite Felling more than the mean annual growth of a plantation generates a surplus cash flow in the short term which should not be confused with higher profits. In fact, continued over-

felling erodes the growing stock and eventually produces a shortage of mature trees for felling.

The establishment costs include planting, fertilising and coppice thinning annualised over the planned rotation period of approximately nine years Tending costs include weeding, pruning, clearing damaged trees, thinning and marking annualised over the planned rotation period. Fire protection costs are incurred annually for the protection of plantations. insurance, conservation and the control of pests and weeds Overhead costs are also incurred annually and include road maintenance, building maintenance. maintenance of improvements, administration and community development Harvesting costs are the annual costs incurred for motor-manual clear-felling mechanical clear-felling, debarking and extraction to roadside. Finally, transport costs are the annual cost of loading and haulage from the roadside to the buyer where a range of road-rail hauliers are contracted to perform this service

6.7.2 Grower Performance

The data comparing the grower performance is displayed in Table 6 9 The grower results indicate that contracted medium-large growers are the most competitive category of timber farmer followed by the Project Grow farmers and the Sappi Plantations. The Sappi plantations of Umkomaas and Richmond appear to grow timber at approximately the same cost as the Project Grow farmers All the Sappi growers. moreover, appear to grow timber at less cost than the provincial and national statistics for eucalyptus production. Contracted medium-large growers' operating costs are some 12.2% to 13.6% below Sappi Plantation costs and 18.2% to 18 5% below the regional and national average largely because of lower forest protection costs. competitive tending costs and lower overhead costs. Contracted medium-large farmers also reflect overhead costs that are 13.1% to 21.5% lower than Sappi Plantations and 31 5% to 32.5% lower than the regional and national averages The principal reason for the competitive overhead cost structure of this category of grower is because many services-facilities are contracted for rather than internalised like the Sappi plantations These services include agronomy, extension. felling and delivery Project Grow overhead costs by contrast. appear to be as high as the Sappi plantations. despite the fact that a majority

of forestry services-facilities are contracted for Project Grow s overheads, m re ver could be understated as a result of not including certain Sappi Forest overhead costs

Table 6.9 Comparative Grower Performance

Grower Cost and Revenue Data	1. Umkomaas	2. Richmond	3. Med.-large	4. Project Grow	5. Natal	6 SA
Mean Annual Increment	12.90	13.10	19.15	11)0	13 8	14 8
Planned Age at Clear-felling	10.00	10.00	8 9	9.1	9 3	9 7
Actual tons	99683	219531	569115	4583	1554823	4322 ›4
	R/ton	R/ton	R ton	R ton	R t n	R t n
Selling Price	225.21	224.47	190 75	191 0	223 41	2 9 54
Establishment	8.19	11.01	9 31	N a	12 3	14 43
Tending	11.07	7.58	8 92	N a	12 59	12 33
Forest Protection	23.08	20.57	11.15	N a	18 ›3	18 11
Harvesting	39.04	38.83	42 27	N a	4 91	›8 4
Transport	50.33	55.99	43 99	N a	58 14	1
Operating Cost	131.71	133.98	115 64	131 0	142	141 9
Overheads	39.13	35.33	30 70	36 00	45 51	44 85
Total Production Cost	170.84	169.31	146 34	167 00	187 51	8 84
Net Profit	54.37	55.16	44 41	24 00	35	22 7
°o of Total Cost	°o	°o	°o	°o	°o	°
Establishment	4.8	6.5	6.3	N a	6 4	7 7
Tending	6.5	4.4	6.1	N a	6 7	6
Forest Protection	13.5	12.1	7.6	N a	9 8	8 1
Harvesting	22.9	22.9	28.9	N a	21 8	2 6
Transport	29.5	33.1	30.1	N a	31)	33 0
Operating Cost	77.1	79.0	79 0	78 0	75 7	7)
Overhead	22.9	21.3	21.0	22 0	24 3	24 0
Total Production Cost	100	100.0	100.0	100.0	1(0 0	1

1 & 2 Average Cost for 1997-2000 at 1999 Prices
3 Results of May 2001 Workshop covering 61 000 hectares Prices restated to 1999
4. Results for 98 Project Grow farmers within a 50 km radius of Saiccor between 198 -2)1
5 & 6 Results for 1999 Calendar Year
*excludes interest levied on R10 million

Project Grow expenditure may also be understated as the cost of family labour is not necessarily reflected and the cost of any operations that have been self financed have also been excluded. On the basis cost efficiencies, however, Project Grow farmers do not appear to be as competitive as medium-large growers but appear to enjoy a similar level of cost efficiency as the Sappi plantations whilst outperforming the regional and national averages. The limited nature of the Project Grow cost data, however, would suggest that further cost comparison studies should be undertaken

6. 8 Have Small-scale Growers Overcome the Barriers of Entry ?

Project Grow farmers delivered some 18 000 tons to the Sappi-Saiccor timber supply operation in 2001/2 . The sale of timber, moreover, generated R2 6 million in revenue for the growers in this period with an estimate of R3 5 million projected for 2 (2 3 Linkages effects in the region reveal that Project Grow activities have resulted in the employment of 1120 people by contractors who assist the growers with the planning and harvesting of their plots. The project has also contributed towards the upliftment of women in this area as some 80% of the growers registered with the project are female The project, moreover, generates considerable revenue for local communities with an estimate of 50% of turnover retained within the community as a result of payments to local contractors, 42% retained by the grower and 8% refunded to Sappi Forest as loan repayment. Despite these benefits to the community, however, it is doubtful whether the individual growers could be classified as emergent commercial farmers The individual timber lots are mostly less than one hectare, operate under conditions of traditional land tenure and do not constitute the major source of income for the family farm The small-scale grower operations are, moreover, almost entirely managed by Lima who, in turn, are funded by Sappi Forest division. The continuity of Project Grow is almost entirely dependent on the support of the Sappi Forest division. The withdrawal of the Lima management inputs, in this respect, would seriously jeopardise the continuity of the project in it's present form. The current level of Sappi inputs has allowed this category of grower artificial access to the timber industry on an economic return basis The results confirm that large numbers of micro farmers can be linked to agribusiness as a result of a contracting arrangement. This study, however, cannot suggest that the Project Grow contracting arrangement has allowed small-scale farmers to overcome the barriers of entry to the industry on a permanent basis. Despite this negative conclusion, Project Grow demonstrates that pro-active engagement by agribusiness can create opportunities to engage smallholders in agricultural supply chains.

6.9 Summary and Conclusion

The results of the case study, with respect to the first research question, suggested that the transaction characteristics of the timber supply-processing operation influenced the

level of managed co-ordination required. These results support the results obtained in the previous case study. The high levels of frequency-asset specificity, combined with a certain measure of uncertainty, indicate that Sappi-Saiccor requires high levels of managed co-ordination to synchronise the timber supply-processing chain The results also demonstrate that the open market would not be able to support the logistics of the input-output function. Whilst it can be confidently demonstrated that the transaction characteristics influence the minimum level of managed co-ordination, it is more difficult to assess the same relationship with respect to the maximum level of managed co-ordination. The reason for this is that fully integrated structures, while being capable of co-ordinating the respective activities, might incur higher levels of bureaucracy cost, that could contribute towards the unsuitability of this governance structure This study has demonstrated that the choice of a governance structure to co-ordinate the timber supply operation can employ transaction theory to complement its other design techniques.

The results of the case study, with respect to the second research question, suggest that the prevailing institutional framework has exercised considerable influence on the transaction cost structure of the timber industry. Despite, the qualitative nature of the arguments developed, the usefulness of this finding is that management can consider alternate ways of reducing transaction cost as a result of a better understanding of causality. Williamson (2000) suggests that the firm should attempt to shape institutional costs before matching organisation structure with the prevailing transaction characteristics. The timber industry, a major player in the South African economy, has the necessary political strength to lobby for policy that can reduce transaction cost

The results of the case study, with respect to the third research question, demonstrated that small-scale farmers generate higher levels of transaction cost than larger growers This is demonstrated in all phases of the timber production cycle The results also demonstrated that a high differential level of transaction cost occurs in a majority of the Project Grow activities, from the planting-growing phase through to the incremental cost of administering the grower affairs. The results of testing this research question can be usefully employed in not only identifying the different cost elements of transaction cost, but also the reasons for the differential level of small-scale farmer cost These results

form the basis of a series of proposals to reduce small-scale farmer transaction cost, as well as the design of suitable control systems. Transaction cost, by being clearly identified, can form the basis of redesigning contracting arrangements with small-scale growers or, alternatively, be used as a basis to influence government policy to introduce special relief for agribusiness start-up costs that support contracted small-scale suppliers. Alternatively, incremental transaction cost could be charged back to farmers used as a basis to organise smallholder operations into larger business units or to lobby for support.

The results of the case study appear somewhat inconclusive with respect to the fourth research question because of the lack of detailed smallholder costing records, but suggest that if small-scale farmers can reduce overhead costs, they will be able to compete successfully with other contracted medium-large suppliers and the company plantations. A reduction in overhead cost could possibly be attempted by the formation of a farmers' association to eventually replace the Lima management structure and to represent the interests of the individual members. By comparison, contracted medium scale suppliers appear to be the most cost efficient growers of timber in terms of both operating cost and farm overheads and the management of overhead costs appears to be a critical cost element. One of the principal reasons for the higher levels of small-scale growing cost, appears to be the excessive cost of managing the individual farmers who, on average, farm 0.6 hectares each. The Sappi Forest Division, despite carrying a high level of facilities costs, demonstrates similar levels of overhead cost per ton to Project Grow. The results of the study can be used as a basis to design alternate smallholder management structures and, perhaps larger smallholder operating units in order to foster higher levels of cost efficiency.

The results of the case study are also somewhat inconclusive with respect to the fifth research question because the case study has not clearly demonstrated that small- cale farmers have overcome the barriers of entry to the timber industry on a sustainable bas s Without the extensive support and start-up cost incurred by the Sappi Forest divisi n the Project Grow operation would never have become functional At best the case study has demonstrated that Project Grow farmers, as a result of the high levels of start-up c st and support, are accommodated in the Sappi-Saiccor timber supply operati n The

principal benefit of the case study is a better understanding of the pitfalls and costs that agribusiness integrators can incur when embarking on small-scale contracting projects More specifically, the case study demonstrates that permanent growers in the supply chain need to operate as viable business entities. Whilst support in the start-up phase is a necessary pre-requisite to overcoming the barriers of entry, the contracted farmers need to be weaned out of the company structure on a long term basis. The Sappi-Saiccor case study is useful because it can be used as a basis to estimate the cost of ensuring that small-scale farmers overcome the barriers of entry Finally, the results of the case study with respect to all five research questions, are incorporated in the design of a smallholder contracting model in Chapter Seven.

In conclusion, the Sappi Forest Products division appears to be both an efficient grower and processor of timber within the confines of the Saiccor-Supply Chain It has been suggested, at corporate level, that Sappi core skills lie as a processor of timber rather than a grower. This argument would suggest the possibility of the Sappi Forest Products division unbundling its timber growing activities. In this respect, whether or not the Sappi Forest Division is fully internalised in the company operations, a very high level of managed co-ordination would be required to comply with Sappi-Saiccor timber requirements. It would appear unlikely that contracted medium and large growers can significantly expand their current level of supply and Project Grow, at this stage, supplies less than 1% of the mill requirements. Sappi Saiccor is, therefore, vitally reliant on the Sappi Forest Division and the future ownership-management of these activities will play a strategic role in the long term performance of the dissolving pulp industry On the basis of the results, this study would suggest that Sappi Forest plantations should not be unbundled, and if they are, they should be developed for medium-large growers in the industry. An important strategic perspective will be to lock suppliers, not only into the timber industry, but also to remain suppliers of Saiccor-Sappi only

Small-scale grower supply models, one of the only potential sources of expanding timber supply, need to be developed in a more efficient manner than the Project Grow model. A number of challenges face the expansion of this sector Firstly, the paternalistic nature of the relationship between Sappi Forest and Project Grow is unlikely to contribute towards the commercialisation of this category of grower Idea

each grower should be entrepreneurial and a climate of free loans, combined with high levels of company inputs, is unlikely to develop this category of farmer The vital issue of institutional capacity building is a challenge to government, NGO s, local communities and the relevant corporate partners involved and local communities need t develop their own institutions to engage in the modern economic sector Project Grow farmers could consider operating under the umbrella of a farmer's association The role of tribal authorities, local government and land tenure need to be resolved together with a wide range of gender issues.

Chapter Seven: A Model to Link Small-Scale Farms with Agribusiness

7.1 Introduction

In the context of the case studies reviewed earlier, the objective of this chapter is to develop a model to assist the design of agribusiness-smallholder contractual relations The development of a proposed model is a response to the need to expand small-holder agribusiness contracting arrangements that are able to prevent exploitation, manage the relationships between the parties, prevent shirking and opportunism and to configure agribusiness and farmers with international quality requirements The development of the proposed model embraces the lessons of Chapter Two, the conceptual developments of Chapter Four and the case studies as outlined in Chapter Five and Six. Although the proposed model has been developed on the basis of the results of the case studies, it has been structured in such a way that it can be adapted to the supply of other commodities. A specific feature of the model, moreover, is that it incorporates costing-software systems that can identify the differential cost to agribusiness of contracting with different types of farmers and commodities The outline of the chapter commences with a discussion of design in relation to the complex nature of the firm before developing a series of proposals. A proposed model is then constructed before a summary and conclusion is developed

7.2 The Design of Management Control Systems

Despite recent developments in economic and strategic management theory, a number of factors contribute to the difficulties of designing firm level structures and controls Despite progress towards understanding the firm, they are still not fully understood because of their complex nature. Organisations are complex because they are systems that recognise more than one ultimate principal and corporate situations are often simultaneously social and economic (Barney & Ouchi, 1988; Williamson, 2000) The design of organisation structures incorporates a control motive, as well as a need to provide decision-making, performance evaluation and reward structures (Walker, 1998; Dietrich, 2001). The design of structures and control systems is better able to reflect the emergence, size and performance of the organisation, if a the ry of the firm approach is adopted (Groenewegen & Vromen, 1996, Pitelis 1) (Williams n

1996;2000); Walker, 1998; Dietrich, 2001). The emergence of organisational economics has been matched with a realisation of the importance of organisational structure in modern agricultural supply chains that are increasingly reflecting the need for tighter levels of alignment (Barry et al, 1992; Royer, 1995; Pasour, 1998, Brickley et al, 2001). Furthermore, the major theoretical developments of the firm have provided an ideal opportunity to apply new approaches to understanding and evaluating the managerial and organisational environment of many industries undergoing structural change (Barry et al, 1992). Finally, an understanding of the economics of the firm is especially important in the currently changing environment, that has witnessed dramatic changes in information technology, more competitive markets, changing organisation structures and new management practices (Burns and Scapens, 2000).

The design of structures and control systems is influenced by the physical production processes of the firm and the non-accounting systems that track resource flows and their related transactions. Design is influenced by both production-distribution technologies, the output market, the level of competition (Drury & Tyles, 1998), production complexity, the product mix, the level of indirect cost, the level of tracking required to monitor resources, the frequency of reporting and the lag between actual and reported events (Karmaker et al, 1990). The level of competition has also been directly linked to the emergence of more sophisticated control systems as a result of the higher levels of price sensitivity, shorter product life cycles, higher levels of cost competition and the presence of substitute products (Mia & Clarke, 1999) Organisations that pursue a confrontational strategy, need to adopt more comprehensive control systems to produce new products more rapidly and make their products more economically in smaller batch sizes. This type of firm often requires a close relationship with suppliers and inter-organisation control systems are essential to capture co-operative economies of scale (Cooper, 1996). Finally, the design of modern control systems has been profoundly influenced by developments in information technology that underwrite most activities and are a key component of strategy (Karmaker et al, 1990; Christiansen & Mouritsen, 1996).

7.3 The International Experience: Suggested Solutions

The economics of contracting would suggest, in many instances, that there is no particular reason for the integrator to choose small-scale suppliers over larger growers if all the contracted parties are paid the same price and deliver the same level of quality. This being the case, it is necessary for agribusiness to take specific steps to either avoid the cost or, alternatively, charge back the differential cost to the respective contracted farmer.

A series of general proposals can be developed on the basis of the experience of smallholder contracting. These lessons include the importance of screening future partners, the need to understand how historical and institutional legacies have influenced contracting arrangements and the advantages of creating mutual asset specificity between the contracting parties. Additional lessons include the important role of logistics, the need to carefully assess start-up cost, the need to invest in smallholder partners and promote access to facilities, the importance of commodity characteristics and the implication of contracting with large numbers of small-scale farmers. Other important lessons include the presence of a competitive fresh market, the role of the state, the role of trust-contract conflict, property rights economics, the strength of agribusiness management, the volatility of world prices and the important role of women. Kirsten and Sartorius (2002) suggest that these problems, and their suggested solutions, can largely be summarised as follows:

- High levels of transaction cost
- The difficulties of contract enforcement

7.3.1 Transaction Costs

The international experience, in line with the case studies, demonstrates that contracting with large numbers of small-scale suppliers has been associated with higher levels of transaction cost (Runsten & Key, 1996, Rehber, 1998, Key & Runsten, 1999). Sappi Limited, for instance, has invested ten years and R 10 million to establish small-scale tree farming in Kwazulu-Natal The Transvaal Sugar

Company in Mpumalanga incurs an annual cost of in excess of R3 million to ensure the viability of small-scale supply, whilst the Mhlume Sugar Company and the Swaziland Government incurred a cost of R600 000 over three years to establish a fifty family farmers' association.

The transaction costs of small-scale suppliers in the case studies clearly exceeded those of larger suppliers. Transaction cost can be reduced by a careful analysis of start-up costs, an understanding of how historical legacies influence transaction cost, an understanding of the relationship between commodity characteristics and transaction cost, the development of mutual asset specificity and the use of farmers associations.

Start-up Cost

The careful assessment and treatment of start-up cost is a key project evaluation procedure. In many instances, agribusiness must commit long term resources to establish small-scale farmer projects. Start-up cost will, generally, be higher if non traditional crops are being introduced, because of the need to train farmers and introduce complex technology. The start-up cost, moreover, can include the linking of small-scale farmers to institutions like banks, insurance companies and suppliers The lack of access to these facilities, in conjunction with infrastructure deficiencies, has been cited as a prime cause of project failure (Gittinger, 1982) This study proposes that the incidence of small-holder contracting in South Africa will be negatively influenced if agribusiness is expected to bear the full cost of start-up The assessment of start-up cost, therefore, should form the basis of lobbying for government subsidy-relief or alternatively to charge back this amount to the farmers If the contracted farmers are unable to amortize start-up cost, the viability of the operation should be questioned from the outset.

The careful screening-identification of future partners is a key success factor Farmers who have a record of previous interaction with agribusiness, appear to be more successful contracting partners (Levin, 1988; Porter & Phillips-Howard, 1997a, 1997b). The three case studies all appear to have developed a data bank of farmer details for each prospective new farmer. In the case of the sugar industry, the

screening process took more cognisance of the entrepreneurial ability of the prospective applicant, whereas, in the timber industry, it would appear as if a majority of applicants were accepted. Screening costs, involving large numbers of applicants, can be significantly reduced if these activities are assisted by a representative farmers' association or if agribusiness contracts with the farmers' association, rather than the individual farmer. The benefits of screening can be increased if the process includes a business aptitude test, a credit check and a list of assets-collateral The screening process could also capture the location, logistics and communication channels of the applicant in order to ascertain the spatial dynamics of the project.

The design of the logistics of small-scale farm supply is a crucial success factor The timber case study illustrates the increased level of transaction cost generated by large numbers of small-scale farmers that are spatially dispersed. Agribusiness, at the outset, can evaluate the transaction frequency of visits, inputs and farmer deliveries with the distances involved, the nature of the roads and the available communication system. The transaction cost of logistics can be fundamentally reduced by allowing a farmers association to provide the necessary inputs, as well as organise the logistics of small-scale supply. The timber case study suggests Sappi Forest should contract with a farmers association for an aggregated monthly volume of timber instead of contracting individually with the 7 100 micro farmers. In the absence of a farmers association, agribusiness can improve efficiency by establishing the suitability of the roads, access and communication systems of the proposed project The timber case study indicated that certain areas were impassable in the wet season and that declining levels of rural security and high levels of ethnic conflict have resulted in a lack of access, except for local community members. Finally, the agribusiness company can assemble and program the transaction cost of logistics by capturing the spatial dispersion of the farmers, the number of transactions and the average distance to the processor.

Historical Legacies

An understanding of the historical legacies and institutional environment will contribute towards a better understanding of the future transaction cost of contracting with large numbers of small-scale farmers Transaction cost theory suggests that the

transaction characteristics of agricultural supply chains are a function of a range of historical-social variables. The case studies debate the pervasive long term influence of historical legacies on economic performance. The legacies that have influenced transaction cost include culture, the historic concentration of industry, the influence on property rights economics, the level of regulation and the concentration of political power. It is suggested, therefore, that the design of contracting structures incorporates an understanding of how historical legacies influence transaction cost. Appropriate design measures can then be taken to reduce transaction cost in two ways Firstly, many industries have the power to lobby for changes in the institutional framework and Williamson (2000) suggests that this form of economising can significantly reduce transaction cost. South African agribusiness, because of its important role in the economy. can attempt to lobby for property rights amendments and some form of subsidy-tax relief for undertaking smallholder start-up costs. Secondly, the design of organisation structures can be undertaken more efficiently if an understanding of the dynamics of transaction characteristics is incorporated.

Commodity Characteristics

Certain commodity characteristics are better suited to contracting. Crops, in particular, that are labour intensive in the growing operation and display economies of scale in processing, are more suited to smallholder contracting (Delgado, 1999) The case studies in the sugar and timber industries did not demonstrate particular growing economies for smallholder family labour, yet these growers, mostly matched larger growers with respect to the cost efficiency of production. The reason for this ability to compete with larger growers appears to stem from the avoidance of overhead cost rather than the productivity of family labour. The results of the case studies suggest that smallholders may be able to compete as growers with commodities that are not particularly labour intensive, thus further relaxing the suggested product range of Delgado (1999). Commodity characteristics can also be linked to transaction cost for design purposes. Commodities that are perishable will require higher levels of co-ordination cost than those that can be stockpiled. Alternatively, commodities that have long growing periods may require a different contract structure from annual or shorter term crops. Growers in the timber industry sometimes receive advances for work performed against the sale of the future crop The design of contracting structures can

thus consider developing a commodity characteristics profile and use this, together with processing capacity, as the basis for determining the transaction characteristics of frequency, asset specificity and uncertainty to determine an optimum structure Finally, the inappropriate choice of technology, a function of the commodity characteristics, has been cited as a cause of project failure (Gittinger, 1982) Finally, agribusiness often has a choice of technology alternatives and it has been suggested that if a labour intensive option does not detract from performance, this option could be chosen to better suit the competencies of the developing country farm family

Mutual Asset Specificity

The creation of mutual asset specificity reduces uncertainty and raises the exit costs of both sets of contracting partners. The case studies in the sugar and timber industries indicate that the agribusiness partner is confronted with significantly higher levels of asset specificity than the contracted farmers. The industry and site specific processing assets, in the sugar and timber case studies, were valued at R 2-2 3 billion and R 5 billion respectively. Conversely, the contracted farmers owned fewer assets that were of a more general nature. The South African sugar firm, TSB, has a very high level f asset specificity and relies on contracted out-growers for 80 % of sugarcane supply Transaction cost theory would suggest that a higher level of managed co-ordination is needed in the absence of inducing higher levels of mutual asset specificity or other interlocking factors. Mutual asset specificity can be pursued by way of farmers' associations undertaking the purchase of industry specific capital inputs The Swaziland sugar farmers' associations appear to have increased mutual asset specificity by investing in sugar specific plant and equipment that are too lumpy f r the individual farmer. Agribusiness can attempt to act as a facilitator of finance, n this regard, to increase the interlocking nature of the arrangement Agribusiness can examine other ways of influencing mutual asset specificity by way of configuring the technology of the grower-processor operations in such a way that only the company possesses the technology to perform a specific element of the growing operati n Contracted growers, for instance in the processed tomato sector, require specif c harvesting technology that is often owned and operated by agribusiness (Rehber 1998).

Farmers' Associations

The problems of smallholder representation and high transaction cost can be addressed by organising a farmers association to undertake the administration of its members interests. The farmer association can be responsible for configuring its members with the contractual arrangements of supply. The farmer association could also be used as a way to deliver agribusiness quality requirements and inputs including training, extension, technology acquisition, the provision of commodity inputs and the co-ordinating of harvesting-delivery schedules. A farmers association can result in lower screening costs, reduced transaction frequency and facilitate the purchase of lumpy capital inputs. Agribusiness can increase the successful operation of the farmers' association by acquiring representation in the management structure, as well as allowing the association to be represented in its own management structure Swaziland farmers associations in the sugar industry, for instance, are represented in the factory cane supply committee. Agribusiness, moreover, can further influence the efficiency of the farmers association by ensuring this body maintains records, has no political agenda, is limited in size and contains sufficient professional management

7.3.2 Contract Enforcement

The economics of property rights and contract enforcement are an important success factor with respect to small-scale farmer contracting. In many instances, contract enforcement is difficult to ensure through the legal process and the logic of contracting with large numbers of small-holders is a questionable issue (Runsten & Key, 1996; Rehber, 1998; Sofranko et al, 2000). Williamson (2000) suggests that the firm can attempt to favourably influence the prevailing institutional environment in order to improve the economics of property rights. South African agribusiness has the potential to influence legislation that includes land tenure, the water act, the role of tribal authorities, the labour act, the rights of the female farmer, the national heritage acts and the conservation laws. The timber case study is an example of legislation that substantially complicates contract enforcement and increases transaction cost by way of a plethora of acts and legislation that must be complied with in order to register a new grower.

A number of steps can be taken to facilitate contract enforcement, including ensuring that the presence of competitive fresh market does not disrupt supply, contracting with a farmer association, the use of contract innovations and the development of trust in contractual relations.

Competitive Fresh Markets

The history of contracting demonstrates that the presence of a competitive fresh market for grower outlets increases the level of uncertainty of supply. Transaction cost theory explains the increased level of cost to the integrator in terms of higher levels of opportunism by the grower. The occasional opportunistic sale of timber in rural Kwazulu-Natal highlights this problem, that was well documented in the Mexican tomato growing sector (Runsten & Key, 1996). The unauthorised sale of the contracted commodity can be especially problematic in the case of projects involving large numbers of small-holders in developing countries with poorly regulated property rights economics. The company, in this type of scenario, may not be able to legally enforce the contract because of the incremental cost of dealing through an inefficient system and the micro nature of the contract. Agribusiness can reduce unauthorised sales by securing an agreement with competitors with regard to the purchase of the commodity. Finally, the chances of contract enforcement are improved if market based prices are paid for the raw commodity or, alternatively agribusiness could locate outside the area of the competitive fresh market.

Contract Innovations and Trust

The representation of farmers' interests by way of a farmers' association can improve contract enforcement (Little & Watts, 1994). Agribusiness can also employ tribal authorities to enforce the contractual conditions. The logic of attempting to legally enforce a set of contract conditions, with respect to a farmer on less than a hectare of communal tenure land, as was the case in the timber study, is questionable.

The use of a renewable contract is suggested as a cost effective way to achieve enforcement (Key & Runsten, 1999). The Swaziland sugar case study indicates that the company renews supplier contracts on an annual basis. If suppliers have not

performed in the previous year, their contracts are simply not renewed the following year. Conversely, the processor in the timber case study appeared to pursue contract enforcement by way of registering a timber servitude or bond. Gow et al (2000) have demonstrated that contract innovations, or interlocking factors, can contribute towards improved contract enforcement. These factors include the administration of growers' affairs, the company acting as banker, the supply of inputs and high levels of involvement in local communities. The timber industry case study demonstrates the interlocking nature of a contract that provides financial assistance and or part payment for certain phases in the growing process. Colchao (1999) suggests agribusiness can successfully induce contract enforcement by acting as a banker to the contracted farmer. Agribusiness is able to compete in the banking sector as a result of better information, combined with the ability to enforce contracts in alternate ways. The company could attempt to own-control the assets and technology of the grower and play a role in the financing of these assets (Colchao, 1999). The timber case study, moreover, suggested that the smallholder management company, LIMA, has effectively become a high cost interlocking mechanism because it is so integrated in the everyday affairs of contracted growers. The company not only manages the entire spectrum of smallholder activities, but also administers their financial affairs. LIMA also acts as an intermediary banker by facilitating and administrating SAPPI loans and advances, at subsidised interest rates, by way of a loan repayment scheme that operates through the company's debtors system. The sugar case studies also suggested high levels of agribusiness investment in local communities, including housing projects, medical services and schooling facilities. The contracted growers had access to a range of interest free inputs and services and termination of the grower contract would imply a loss of all these facilities to not only the contracted farmer, but their dependants as well.

Fafchamps and Minten (1999) suggest that trust based relationships can be a dominant interlocking factor that can contribute to contract enforcement. Transaction cost theory suggests that trust influences uncertainty as a result of its effect on the opportunistic behaviour of the contracting parties. Farmer distrust, combined with a perceived loss of autonomy and feelings of exploitation, has been widely cited as a major cause of contracting failures in developing countries (Glover, 1987, Clapp, 1994; Watts, 1994). It has been suggested that the success of future South African

contracting arrangements will be influenced by the level of trust that can be engendered between the parties. The development of trust is especially important given South Africa's history of colonialism and apartheid (Porter & Phillips-Howard, 1997a; 1997b). Trust has been demonstrated to reduce transaction cost in the South African beverage industry (Tregurtha & Vink, 1999) and the Swaziland sugar case study indicates that a reasonable level of trust has reduced contract conflict and transaction cost. Trust can be quantitatively measured using a field survey technique This technique, employed in the Swaziland sugar case study, involved a quantitative survey to evaluate the level of farmer satisfaction and trust. Trust can also be built by ensuring that company interface officers are local and that grower information is conveyed in the local language of the community (Porter & Phillips-Howard, 1997a 1997b). Trust can be further improved by developing grower representation in all stages of the decision making process (Delgado, 1999). The company can also ensure that the provision of inputs and technical advice is seen as advice rather than supervision. The sugar industry case studies indicate that both Transvaal Sugar Company and Mhlume Sugar (Swaziland) carefully accord the necessary level of respect-advice to growers and see them as business partners. These companies have embarked on a long term program to build social capital in the form of developing independent entrepreneurs, by providing facilities and education on the assumption that higher levels of efficiency and trust can be inculcated to ensure contract enforcement, as well as reduce cost. Conversely, the timber case study indicates higher levels of agribusiness paternalism and hands on management

7.3.3 Miscellaneous

The grower response to raw commodity prices and other opportunities is suggested as a key long term issue that can influence the stability of the contracting arrangements A long term perspective on prices could contribute to locking contracted growers into a commodity and ensuring continuity of supply in depressed conditions (Levin, 1988 Watts, 1994; Abbott, 1994). The Swaziland sugar case study indicated that, although growers largely trusted the company, they were not entirely happy with the price paid for sugarcane. The current volatility of world sugar markets, combined with the increasing threat of oversupply, suggest increased pressure on grower prices The agribusiness company may be forced to maintain-increase prices t ensure supplies

are maintained in an industry where the profits are largely secured in the processing operations. An unfriendly policy environment influencing prices has been cited as a cause of project failure (Gittinger, 1982) and, again, South African agribusiness can attempt to lobby for favourable agricultural, fiscal and monetary policy

A number of other issues influence the success of small-holder contracting schemes These issues include the role of female farmers, the control of land and water, the role of the state, the household food security issue and land degradation The role of the female farmer is especially important in many developing country contracting arrangements. Carney (1988) and Gittinger (1982) suggest that a failure to understand the social environment is a prime cause of project failure. The case studies in the sugar and timber industries suggest high levels of labour inputs are supplied by female household members. Agribusiness in South Africa can contribute towards the future role of the female farmer, by securing legislation that ensures full representation-rights for the female farmer in communal tenure areas It is also suggested that agribusiness payment for the commodity should be directed to the household member responsible for supply.

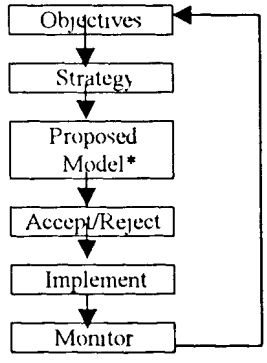
The role of tribal authorities in communal areas will also need to be confi ured t promoting gender access in rural areas. The issue of who controls land and water in the contract relationship can influence the success of the arrangement If the land and water are owned by the contracted growers, the decision making autonomy of the farmer is not affected, however, if they are owned by the company, the conditions of use should be mutually developed and fully understood by both parties Another key issue is the role of the state. In many developing countries the state has been an active partner of small-scale contracting projects. In the Swaziland sugar industry, for instance, the monarchy holds a fifty percent interest in the Mhlume Sugar Company It has been suggested that if the state is a partner, it should provide some f rm of financial assistance. The equity objectives of the state can also be investigated with respect to their impact on economic performance The Swaziland sugar case study indicates that the equity objectives of the Commonwealth Development Corp rati n and the monarchy have contributed towards the establishment of a village, medical facilities and a sc ool. Finally, the issue of food security and land de rada n can influence the long term viability of contracting arrangements Mon -culture

contracting has been associated with a reduction in food crops and an increase in pollution (Rehber, 1998; Pasour, 1998, Wolz et al, 1999) Agribusiness can respond t these threats by encouraging farmers to grow food crops on a percentage of their land and pro-actively investigating the long term threat of growing technologies on sustainable land use.

7.4. The Proposed Model

The proposed small-scale farmer contracting model-project can be viewed as a long term investment decision that forms part of the strategic process The strategic process, illustrated in Figure 7.1, is a dynamic continuum that ensures the objectives of the firm are translated into long term strategy which then forms the basis of the short term plans. These plans are implemented in the form of budgets and monitored by way of performance reporting to ensure the firm's objectives are being pursued (Porter, 1986; Drury, 1996; Horngren et al, 1999; Kaplan & Atkinson, 2001)

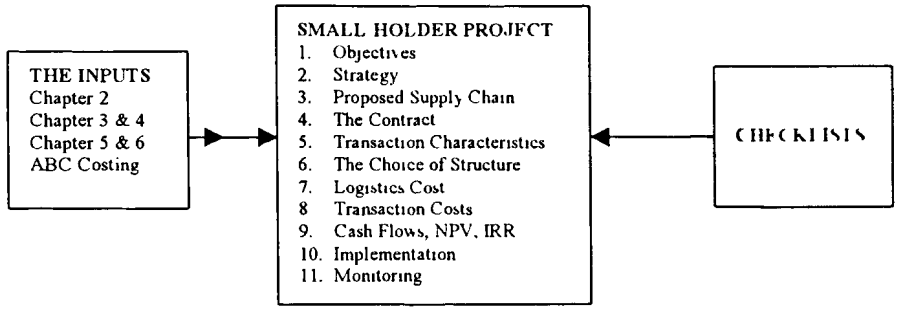
Figure 7.1 The Strategic Process



The design of the proposed small-holder contracting model, illustrated in Figure 7 2, has accommodated the use of the conceptual framework developed in Chapter Four with the need to address the complex nature of design discussed in Section 7 2, as well as the proposals based on the case studies and the international experience listed in Section 7.3. The proposed model consists of the objectives of the smallholder contracting project, the configuration of the project in company strategy, the details of the grower-processor supply chain, the contract-transaction characteristics of the

supply operations and the selection of the optimum governance structure Further features of the model include the cost of logistics, the transaction cost and the aggregated project cash flows that are required to make the final investment decision Finally, the proposed model discusses the implementation and monitoring of the project. A series of checklists are included at each stage of the design process, to ensure that the inputs have been effectively integrated into the proposed model

Figure 7.2 The Proposed Model*



7.4.1 ABC Costing

The model proposes the use of an activity based costing system (ABC) to identify and differentiate transactions. ABC systems are designed on the premise that the firm's activities consume resources and that the operation of the firm can be broken down into a series of activities called cost pools For each cost pool the total cost at a normal level of activity is determined, a cost driver is selected and the total number of transactions of this cost driver estimated. The total cost is then divided by the total number of transactions, to determine a transaction rate which can then be traced to the relevant cost object (Drury, 1996; Kaplan & Atkinson, 1998, Horngren et al, 1999)

7.4.2 The Objectives

The objectives of the proposed contracting project need to be clearly articulated and configured with the mission statement and objectives of agribusiness The project objectives can be focused on economic criteria, equity criteria or include a combination of both (Porter, 1986, Drury, 1996, Horngren et al, Kaplan &

Atkinson, 2001). In a majority of smallholder projects there is a balance of profit versus social objectives (Little, 1994; Eicher & Staatz, 1998) In the case of economic objectives, the firm would normally insist on projects that increase shareholder wealth as measured by economic value added, residual income or a positive net present value of project cash flows. Equity objectives can also be clearly articulated in terms of the type of benefit derived from the project, including social welfare and political economy outcomes. The articulation of equity objectives can, furthermore, form the basis of an approach to the state or a donor body for development aid or assistance-relief in some form. The role of government can be configured into agribusiness objectives in order to create an investor friendly environment that ensures a healthy relationship between agribusiness investment, social objectives and economic return The role-objectives of government can also be used as a basis to create public private partnerships.

7.4.3 The Strategy

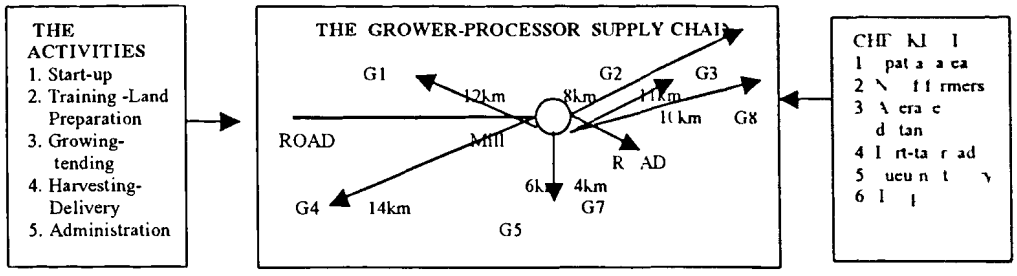
The strategy of the firm is based on the long term plans that hope to achieve the articulated objectives. The proposed contracting model, as a long term investment decision, must be configured with the firm strategy. Firm strategy normally incorporates some form of growth to increase shareholder wealth. Growth strategies incorporate make or buy decisions. If the firm has superior competencies, it may choose the self manufacture route. Conversely, if outside suppliers can provide the goods and services at lower cost, the firm may decide to buy (Porter, 1986, Merchant, 1998; Anthony & Govindrajan, 2001). The choice of acquiring an agricultural commodity from a small-scale contracting project can be questioned as follows Firstly, can the firm grow the commodity at less cost ? If not, can the firm acquire the commodity from an alternate source at lower cost' If the firm can acquire the commodity at less cost elsewhere, then the equity benefits of the small-scale contracting option should exceed the incremental cost

7.4.4. The Grower-Processor Supply Chain: Activities and Logistics

The proposed contracting model can be represented in terms of a grower-processor supply chain illustrated in Figure 7.3. The activities co-ordinated by the grower-

processor supply chain include the start-up phase activities, the planting-growing activities, the harvesting-delivery activities and the administration of commodity supply. The supply chain can be represented as follows

Figure 7.3 The Grower-Processor Value Chain



The activities incorporated in the raw commodity supply operation can be broken down into cost pools in order to accommodate an activity based costing system (ABC). The cost pools could include start-up activities, training and land preparation, growing operations, harvesting and delivery and administration. Each cost pool should identify a cost driver and estimate the total number of transactions A map of the supply chain can then indicate the spatial distribution of the proposed small-scale farmer contracting model. The map should show the total acreage-potential supply volume incorporated in the project, as well as the availability of roads, access and the distance of farmers from the processor. The average distance from farmer to processor can be estimated for the small-farm project for logistical purposes An analysis of the activities can be performed to estimate the number of visits per farmer per activity per year and used as the basis to calculate logistics cost. The activities of the operation can be used, moreover, to ensure the spatial map includes the necessary information, as well as to create a checklist of factors that should be consulted in the design process. Factors that can be checked include the total area, the total number of farmers, the types of roads and communication systems that are available Finally, the use of queuing theory, in the form of convenient software packages, could be employed to optimise logistical cost.

7.4.5 The Contract Conditions

The design of the contract can be based on the characteristics of the conditions that apply to the proposed supply operation. The contract conditions, illustrated in Table 7.1, can then be analysed with respect to the presence of interlocking factors and or issues that could influence enforcement. On the basis of transaction cost theory, the contract conditions can be used by agribusiness as a basis to select the optimum type of contract structure on the vertical co-ordination continuum of Petersen and Wysocki (1997;1998) to control the project.

The contract conditions can be listed in tabular format and graded on a five point basis to conform with the vertical co-ordination continuum of Petersen & Wysocki (1997, 1998) The conditions could include the ability of the parties to walk away from the contract, the duration, the level of substitutes, the identity of the parties, the levels of ex ante and ex post control, the level of information shared and how contract enforcement is achieved.

Table 7.1 Classification of Contract Characteristics

Contract Characteristics	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Nature of contract	Classic		Neo-classical XX		Relational
Ability to walk away	High		Inter. XX		No
Duration	Short		Inter.		Long XX
Substitutes	Yes		Few		No XX
Own identity	Yes XX		Partial		No
Ex ante control	High		Inter.		Low XX
Ex post importance	Low		Inter.		High XX
Information shared	Low		Inter.		High XX
Enforcement	Legal		Complex XX		Hierarchy

CHECK LIST

1 Farmer participation ?
2 Level of trust ?
3 Farmers association ?
4 Contracts for females ?
5 land degradation factors ?
6 Autonomy tribal structures ?
7 Food crops ?
8 Mutual Asset specificity
9 Interlinkin factors
10 Expectation
11 Provision of output
12 Education ?
13 Land tenure

The actual contract conditions can be projected in the planning process and then plotted in the table. The suitability of the contract conditions, in turn, can be subjected to a checklist that includes whether or not there has been farmer participation in developing the contract conditions, the estimated level of trust and, whether or not the

possibility of a farmers association has been considered Other checks include whether the contracts include female farmers, the issue of land degradation, the accommodation of tribal structures and commodity characteristics and the possibility of developing mutual asset specificity. For illustrative purposes, assume that the highlighted quadrants (**XX**) in the table represent the projected contract characteristics of a proposed project. On the basis of the projected conditions (**XX**), the firm will require a relational or neo-classical type contract structure to accommodate the smallholder arrangement.

7.4.6 The Transaction Characteristics

The estimated or actual transaction characteristics of frequency, asset specificity and uncertainty in the proposed smallholder supply operation can be determined and graded (1-5) on the basis of the conceptual framework developed in Chapter Four A set of transaction characteristics and their respective grade have been matched in Table 7.2. The projected transaction characteristics can be based on an analysis of the projected and actual activities and assets employed in the grower-processor supply chain and the actual contract characteristics of the supply operation Transaction frequency can be determined by the number of raw commodity deliveries, the number of agribusiness visits or the number of accounting transactions generated by smallholder supply activities.

Table 7.2 Classification of Transaction Characteristics

Transaction Characteristic	Cost Drivers	Calculation	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Frequency	Total deliveries Total visits Total accounting Transactions	Supply records See Section 9.4.3 Accounting records					XX
Asset Specificity	Value of plant Co-ordination level Commodity perishability	Financial records Volume-continuity See physical properties					XX
Uncertainty	Unique supply conditions	Analysis of contract conditions. See 9.4.4 + checklist			XX		

The actual value-specifications of the processor plant and equipment can be used as a basis to estimate the level of asset specificity in conjunction with an analys f c -

ordination requirements, the disposability of assets and the transferability of assets Finally, an analysis of the actual contract characteristics, in conjunction with a checklist of factors, can provide a subjective estimate of the level of uncertainty The level of each of the transaction characteristics can be graded (1-5) on the same basis as the contract conditions to provide a basis for selecting the optimum governance form to co-ordinate the grower-processor activities. For illustrative purposes assume the highlighted characteristic (XX) in the table represents the actual projected transaction characteristic of the smallholder supply operation The highlighted transaction characteristics indicate high levels of frequency and asset specificity and an intermediate level of uncertainty.

7.4.7 The Optimum Structure

The selection of the optimum co-ordination structure, illustrated in Table 7 3, is based on transaction cost theory developed in Chapter Three, that is further operationalised in the conceptual framework of Chapter Four. The actual transaction characteristics of the smallholder supply operation, graded from low to high (1-5), are matched with the most suitable governance structure along a vertical co-ordination continuum of structures. For illustrative purposes, assume the firm currently employs a combination of specification contracting (**) and the company estates (**) to supply the raw commodity as indicated in Table 7 3 The hypothetical projected contract and transaction characteristics of Sections 7 4 4 and 7 4 5 of the proposed small-holder project (XX) can be matched with the most suitable structure on the vertical co-ordination continuum and then compared to an existing structure The projected hypothetical transaction characteristics (b) indicate that a governance structure ranging between a strategic alliance and full vertical integration is required to co-ordinate high levels of frequency and asset specificity (5) and an intermediate level of uncertainty (3). The projected contracted conditions (c) also appear to support the need for a more relational type of contract that is best accommodated in a governance form that ranges between a strategic alliance and full vertical integration

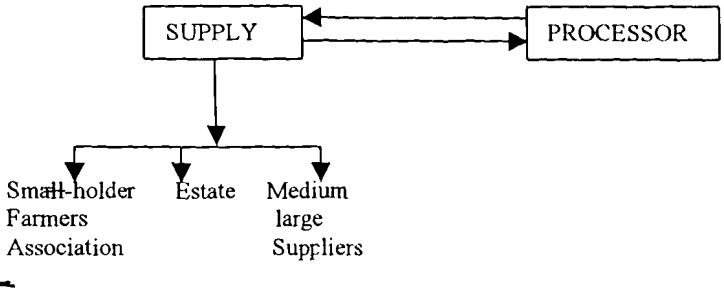
Table 7.3: Matching Structure and Transaction Characteristics

Grade	1.Low	2.Low-Int.	3 Intermedia te	4 Int high	5 H gh
Vertical Co-ordination Continuum	Spot Market	Specification Contracting	Strategic Alliance	Formal Co operation	Full Vertical Integration
a) Actual Structure		**			**
b) Actual Transaction Characteristics					
Frequency					\ \
Asset Specificity					\ \
Uncertainty			XX		
c) Contract Characteristics	1.Classical	2.Classical- neo classical	3 Neo classical	4 Neo- class Relational	5 Relational
Level of Control			XX		\ \
Ability to walk away			XX		\ \
Substitutes					\ \
Parties have own identity	XX				
Duration					\ \
Ex ante control					\ \
Ex Post Importance					\ \
Information Shared					\ \
Enforcement			XX		\ \

Based on: Williamson (1975; 1981; 1986); Petersen & Wysocki (1997, 1998) and Sartorius and K r ten 2 2

The actual governance form (**) appears to employ slightly lower levels of managed control than the optimum structure suggested by transaction cost theory indicating perhaps, that the present-future structure should be moved towards a higher level f managed control. A possible reason for this could be that the contract-transacti n characteristics require a more relational type of contract structure than specification contracting which is used in the actual governance form. The optimum governance form can be complimented with a suitable management structure to ensure that the smallholder activities are configured with the company The case studies suggest that supply should be jointly co-ordinated by the agricultural and processing divisions of the company, when agribusiness is also a grower. In the case where no agricultural division exists, raw commodity supply would report directly to the company A suggested option is represented in Figure 7.4.

Figure 7.4 Management Structure of Supply



The suggested structure can include a company officer on the management structure of the farmers' association and a member of the farmers' association on the raw commodity supply committee of the processor.

7.4.8 The Logistics

The logistics cost, developed on the basis of Section 7 4 4 and illustrated in Table 7 4 includes a range of agribusiness expenditure that relates to the number and spatial dispersion of the growers. These costs will include travel, human resources and facilities expenses incurred as a result of co-ordinating this supply source Agribusiness visits include advice-technical inputs with respect to the land-preparation, growing, harvesting and delivery activities of the small-scale growers The distance and travel cost can be subjected to sensitivity analysis to evaluate the impact of different scenarios. Activity based costing can be used to identify the relevant cost pools, cost drivers and transaction rates in order to charge out logistics costs.

Table 7.4 Distance and Travel Cost

Farmer Activities	1.Number of Visits (see 9.4.3)	2. Average Distance (see 9.4.3)	3. Distance	4 Fuel Cost	5 Resources Facilities Cost	6 Total Cost	7 Cost per ha
	No.	Km	Km	R	R	R	R
Start-up	XX	XX	1 x 2	XX	XX	XX	RXX
Land Preparation	XX	XX	1 x 2	XX	XX	XX	RXX/a
Growing	XX	XX	1 x 2	XX	XX	XX	RXX/a
Harvesting	XX	XX	1 x 2	XX	XX	XX	RXX/a
Delivery	XX	XX	1 x 2	XX	XX	XX	RXX/ha
Total	XXX	XXX	1 x 2	R XX	R XX	R XX	RXX/ha

7.4.9 Transaction Cost

The calculation of the agribusiness transaction cost of the smallholder project illustrated in Table 7.5, can be determined on the basis of the previous calculations in Section 7.4.4, 7.4.5 and 7.4.7. Estimates of staff and facilities costs can be performed on the basis of the analysis of the activities translated into manpower requirements The analysis of the activities can be used to determine the total time-staff cost expended on the smallholder project, whilst the facilities costs can be based on the level of staff cost.

The calculation of transaction cost, developed on an activity based c stin methodology, can be subjected to sensitivity analysis in order to reflect the differential cost of the project. The incremental cost of smallholders per hectare can be determined by comparing the transaction cost of agribusiness both with and without a farmers' association or, alternatively, by comparing the transaction cost per hectare with larger suppliers.

Table 7.5 Estimated Transaction Cost.

Cost Element	1. Travel Cost (Table 7.4) R	2. Staff Cost (Estimate* R	3. Facilities Cost (Estimate*) R	4. Total Cost (1 + 2 + 3) R
Start Up Cost*	XX	XX	XX	XX
Land Preparation	XX	XX	XX	XX
Growing	XX	XX	XX	XX
Harvesting	XX	XX	XX	XX
Administration	XX	XX	XX	XX
Total	R XX	R XX	R XX	R XX
Cost per hectare	R X	R X	R X	R X

CHECK LIST
1 Sensit v t
analysi
2 Farmer
ass ciat n
3 mpact n w t
lar er u ers
4 First ta e
Ec n m

Agribusiness can use this approach as the basis for encouraging the formation of a farmers association, to lobby for state-donor aid or to charge the incremental cost back to the respective farmers. Furthermore, the usefulness of separately identifying transaction cost, in conjunction with the respective activities, lies in the increased ability of the firm to investigate how the prevailing institutional cost can be influenced to further reduce its transaction cost, for instance, influencing le i lation that could affect property rights economics.

7.4.10 The Capital Investment Decision

The final investment decision, illustrated in Table 7.6, can be based on the net present value of the project. The results of the case studies suggest a suitable time horizon for agribusiness projects would normally extend to at least twenty years (Gittinger, 1982) In view of the many factors influencing small-holder supply uncertainty in developin countries, it is suggested that the normal discount rate of the firm is increased by tw percent (2%).

The cash flows of the smallholder project can be determined using financial techniques like the discounted cash flow method (Drury, 1996; Horngren et al, 1999) If the project includes equity or political economy objectives that could translate into tangible monetary assistance, this could be estimated. Agribusiness, on the basis of discounted cash flow techniques, can ascertain the net present value of the project to determine the ultimate impact on shareholder wealth.

Table 7.6 Project Cash Flows

Cash Flows	Year 0	Year 1	Year 2	Year 3	Year 4 20
Working Capital	(XXX)				XXX
Fixed assets	(XXX)				
Start-up cost	(XX)	(XX)	(XX)		
Transaction cost				(XX)	(XX0
Logistics cost				(XX)	(XX)
Purchase of crop				(XX)	(XX)
Factory variable cost				(X)	(X)
Variable cost of sales				(X)	(X)
Revenue				XXX	XXX
State Support-tax relief	XX	XX	XX	X	X
Net Cash Flow	(RXXX)	(RXXX)	(RXXX)	RXX	RXX
NPV	RXXXX				
IRR	X %				
Cash Break Even, AAR	Year X				

CHECK LIST
1 Sens tivity a al
2 Farmer
assoc ati n
3 mpari n w t
lar er u
4 F rst ta e
Ec n mi
5 P llut n
6 C m any im e
7 Trad t na
structures ?

This technique can be complimented with sensitivity analysis that can be perf rmed by way of electronic spread sheets. Sensitivity analysis can evaluate the impact of a farmers association, using alternate sources of supply or charging back incremental smallholder cost. The difference in shareholder wealth can be cited as the basis for soliciting government support, the formation of a farmers association or to char e back the incremental loss to smallholders Qualitative issues can be included in a checklist of factors. Qualitative factors could include concern for the environment, loss of traditional structures and the company image. Finally, the integrator is in a position to make a decision with respect to accepting-rejecting the proposed project Should the project be accepted, the company can initiate the necessary steps to be in the implementation procedure.

7.4.11 Implementation

The implementation of the proposed small-holder contracting project will be in with the development of the annual integrator budgets The budgetary control system will embrace the detailed cost and responsibility centres that will be empl ved to mana e the supply operations. The budgetary control system, in turn, will be used as a basis t

develop the performance reporting system of the integrator that will determine the type and frequency of supply reports.

7.4.12 Monitoring

The monitoring of agricultural projects has been cited as a crucial success factor to configure the expected economic value with the actual results The case studies suggest that the cost systems of the company either included the costs of managing the smallholder project as general overheads or, alternatively, the cost systems were unable to trace certain integrator costs to the smallholder project The use of a monthly reporting system, incorporating activity based costing, could be used t demonstrate the actual versus budgeted performance of the smallholder project This study proposes that the balanced scorecard approach to monitoring performance, developed in the 1980s (Kaplan and Atkinson, 1998), can be expanded to measure performance on a more comprehensive basis. This proposal contributes a unique perspective to the balanced scorecard approach which currently measures business performance from four different perspectives. These perspectives include the financial results, the level of customer satisfaction, the internal efficiencies of the firm and the learning and innovation performance of the firm (Kaplan and Atkinson, 1998) This approach also demonstrate that causality exists between the outcome variable of performance and the driver variables that include customer satisfaction, internal efficiencies and learning and innovation. Table 7.7 reflects how the balanced scorecard approach can be expanded to include an additional two levels, namely, the transaction characteristics and key environmental-social-physical variables

Table 7.7: Expanded Balanced Scorecard

Sector of Performance	Performance Indicators
1. Financial	Net profit, ROI,
2. Customer	Market share, regional versus international
3. Internal Efficiencies	Yield, Cost per ton, capacity utilisation, benchmarked costs of production,
4. Learning and Innovation	Growing technologies, development of value added products, development of new technologies, design of logistics, choice of contracts
5. Transaction-Growers	High Frequency, High asset specificity, High levels of uncertainty
6. Environmental-societal	Social costs, Water, Power, Lab ur Revenue Received. Y el l Taxes Government-CDC partner

The usefulness of this finding is that management attention is specifically directed t an alternative perspective to reducing cost. The results of the case studies suggest that the design of management control systems could reflect key external and transaction cost variables which influence performance This approach to expand n the balanced scorecard of Kaplan and Atkinson (1998) suggests that two additional levels to the balanced scorecard, namely, levels five and six, can be added and a cause and effect relationship can be traced from level six through to level one

7.5 Summary and Conclusion

This chapter briefly discussed the problems of design before developing a series of proposals for small-holder contracting arrangements. The proposals were based on the lessons learned in Chapters Two, the conceptual developments of Chapter Three and Four and the results of the case studies in Chapters Five and Six A proposed model was then developed. The proposed model suggests that small-holder contracting projects can be treated as strategic investment decisions by the agribusiness partner The proposed model can, therefore, be evaluated with respect to its objectives, the firm strategy, the detailed plans, the implementation of these plans and the monitoring of project results. The development of the detailed plans incorporated the use of transaction cost theory and activity based costing systems to calculate the total and differential transaction cost of small-holder projects The detailed plans, moreover, demonstrated that they are capable of being subjected to sensitivity analysis which could incorporate a multiple scenario outlook. The scenarios investigated could examine the impact of using a farmers' association, the opportunity cost of not engaging larger suppliers or the effect of price changes The importance of understanding the cost structure of contracting projects is illustrated by the case studies, which demonstrate that considerable resources have been dedicated to the development and management of small-holder contracts over many years

Chapter Eight: Summary and Conclusion

The study commenced by discussing the changing nature of the modern agricultural sector and the opportunities and threats it presented to small-scale farmers in developing countries. Whilst the opportunities of an expanded range of market niches for farmers was evident, the problematic requirements for size and continuity, in many instances, appeared to preclude smaller farmers. The principal research question addressed by this study was, whether or not, small-scale farmers in developing countries could be linked to agribusiness partners in order to take advantage of some of the opportunities presented by the new paradigm. The research questions that were tested included whether the transaction characteristics of the grower-processor supply operation influenced the required level of managed co-ordination, whether the transaction characteristics of the firm were a function of the historical-social legacies manifested in the prevailing institutional environment and whether small-scale farmers generated incremental transaction cost to medium-large suppliers The other research questions were whether small-holders can compete, in terms of production efficiency, with larger growers and whether the institution of contracting had acted as a mechanism for small-scale farmers to overcome the barriers of entry to a high value commodity.

Chapter Two commenced with a definition of contract farming that was followed by a description of the different types of contracting arrangements that can be employed to co-ordinate agribusiness and farmers. This chapter discussed the history of contracting and recent developments reflecting the increased use of vertical co-ordination arrangements in developed countries, developing countries and South Africa. The chapter then developed a rationale for contracting by explaining how the forces of industrialisation, combined with market failure could influence higher levels of vertical co-ordination. A list of advantages and disadvantages of contracting was then constructed. Finally, the chapter developed a series of lessons, based on the international experience of contracting, that could be incorporated in the design of smallholder contracting schemes. Chapter Three incorporated a transaction cost theory approach to explain how the transaction characteristics of a firm influence the required governance structure before showing, in turn, how the transaction characteristics of the firm are a function of the prevailing institutional environment

Chapter Four refined the operationalisation techniques of Chapter Three in order t develop a conceptual framework that could be applied to the case studies in order t analyse the transaction characteristics. Chapter Five introduced a case study in the Southern African sugar industry and Chapter Six a case study in the timber industry The collective results of the case studies with respect to the five research questi ns are as follows.

The results of the case studies, with respect to the first research question, universally suggested that the transaction characteristics of the grower-processing operations influenced the level of managed co-ordination required. These results clearly support the conclusions developed in Chapter Three and indicated that the processing operations in the sugar and dissolving pulp industries required high levels of managed co-ordination to synchronise the raw commodity supply operations The results also demonstrate that the open market would not be able to support the logistics that co-ordinate the supply and processing of large volumes of sugar and timber respectively Whilst it could be confidently demonstrated that the transaction characteristics influence the minimum level of managed co-ordination, it was more difficult to assess the same relationship with respect to the maximum level of managed co-ordination The reason for this is that fully integrated structures, whilst being capable of co-ordinating the respective activities, incur increasingly higher levels of bureaucracy cost that eventually contribute towards the unsuitability of this governance structure This study has demonstrated that an understanding of organisational economics can be employed in the choice and design of a suitable governance structure to co-ordinate a raw commodity supply operation. More specifically, an understanding of organisational economics can allow agribusiness to determine the minimum level of managed co-ordination that is required to co-ordinate a given set of transaction characteristics. The process of matching the transaction characteristics of the grower-processor supply chain with the most suitable structure, was largely guided by the u e of the conceptual framework developed in Chapter Four.

The usefulness of this approach can be applied by agribusiness to test, whether or not, sufficient levels of managed control exist in an existing or proposed grower supply chain. The South African case study in the sugar industry, for instance, dem nstrated that 80% of the sugarcane supply of the Transvaal Sugar Company was acquired by

way of specification contracting. The sugarcane supply-processing operation also demonstrated high levels of asset specificity and frequency to suggest that, given the low-moderate level of supply uncertainty, the firm should investigate the possibility of increasing the level of managed co-ordination from specification contracting to some type of joint alliance. Conversely, in the other two case studies, the miller-cum-planter operations supplied 50% or more of the raw commodity for processing, reducing the level of supply uncertainty and supporting the choice of contracting to acquire the balance. The usefulness of the results is that they also highlight the dangers of the pre-mature unbundling of company estates to smallholder supply chains. The shorter term perspective of the smallholders, in this respect, combined with the inherent instability of agriculture, suggest that processors, over the long term, could alienate themselves from their raw commodity supply sources by an over reliance on contracted suppliers. The results suggest that a higher level of managed co-ordination, like a joint alliance, is required to reduce long term supply uncertainty in a situation where the processor is not a substantial miller-cum-grower Finally, transaction cost theory can also be applied to the relationship between commodity and transaction characteristics. Certain crop types, for instance in Sub Saharan Africa, demonstrate unique commodity characteristics in the growing and processing operations that pre-dispose them to being co-ordinated in a contracting structure Furthermore, the transaction characteristics of technology development-protection, the cost-benefit of information technology and the emerging importance of quality require a specific understanding of the relationship between structure and cost

The results of all of the case studies, with respect to the second research question, suggest the pervasive, and long term influence of social-historical legacies on the economic performance of respective industry sectors More specifically, the case studies demonstrate how the institutional structure-cost in Southern Africa has been influenced by the earlier experience of colonialism-apartheid combined with the original concentrations of industry and infrastructure The South African case studies, for instance, suggest that two hundred years of apartheid-colonialism have fundamentally influenced principal-agent costs, the concentrations of infrastructure and the property rights economics of the country. The Swaziland economy, moreover has been controlled by the proximity and economy of South Africa in this period These factors, combined with macro-economic influences, the availability of natural

resources and the development-capabilities of local authorities, have largely shaped the institutional cost of transactions in the Southern African sugar and timber industries. The timber case study, for instance, indicated how historical legacies have contributed to a plethora of regulations-procedures required by a prospective grower to comply with the requirements of both local and national authorities before a water permit was granted. Clearly, the agribusiness transaction cost of assisting these growers was influenced by both the degree of regulation involved, as well as the inefficiency of local government authorities. The current, somewhat inflexible labour act in South Africa is a further example of how the costs of labour contracting have been influenced by a government attempting to redress historical imbalances

The case studies also demonstrated how the original concentration of the sugar and timber industries in Southern Africa were located in limited areas that provided the necessary natural resources. The government of the time, international donor bodies and prevailing multinationals then "kick-started" these industries by providing major inputs, infrastructure and policy to protect these fledgling industries until they were able to compete. The original establishment of these industries, combined with a lack of incremental natural resources, presents an almost insurmountable barrier of entry for new entrants. These industries display high levels of site, asset and human skills specificity as a result of the historic concentrations of economic development in specific regions of Southern Africa, as well as, the evolution of human skills and knowledge over the long term. The case study tested this research question by using the Williamson (2000) schema of theories model to demonstrate the causative link between a current set of transaction characteristics and the prevailing institutional environment. The usefulness of this finding is that management attention is specifically directed to an alternative perspective to reducing cost. Organisational economics, therefore, has the potential to persuade modern management to adopt a broader focus than the neo-classical type input-output functions of their firms The results of the case studies suggest that the design of management control systems could be expanded to reflect key external and transaction cost variables that influence performance. Finally, Southern African agribusiness, including the sugar and timber industries, has the influence to look outside the firm in order to economise institutional cost. Lobbying, for instance, for improved property rights economics can result in a wide range of transaction cost savings. Simultaneously, favourable policy

regarding the issue of smallholder start-up costs would not only reduce agribusiness transaction cost but also comply with the state's objectives with respect to the growth and transformation of the agricultural sector.

The results of the case studies, with respect to the third research question, demonstrated that small-scale farmers generate higher levels of transaction cost than larger growers. Whilst the sugar industry case studies suggested this differential cost was mainly confined to the start-up and administration activities, the timber case study indicated that smaller growers generated differential cost in all stages of the growing operation. The results of all three case studies, illustrated in Table 8.1, indicate the high level of incremental cost associated with smallholder supply. The usefulness of the results is that they can be used as a basis to install costing systems that trace differential cost to the respective category of grower in order to act as a basis to reduce integrator transaction cost in the future

Table 8.1 Differential Transaction Cost

Transaction Cost	Mhlume Sugar	Mhlume Sugar	Transvaal sugar	Transvaal sugar	Sappi-Saiccor	Sappi-Saiccor
	Small grower	Large grower	Small grower	Large grower	Small grower	Large grower
Start-up cost	3 years, R 600 K	Self, ad hoc inputs	R 3.2 mill. Annual budget	Self, Ad hoc inputs	R 10 million, 10 years (300% than large)	Self ad hoc inputs
Land Preparation	Training, management inputs	Ad hoc inputs	Training, management inputs	Ad hoc inputs, self	Training supervision assistance with inputs	Technical advice
Growing	Extension, access to inputs	Largely self organised	Extension, access to inputs	Largely self organised	Active supervision total inputs (350 % larger growers	Ad hoc advice largely self organised
Harvesting-delivery	self	self	Self	Self	High level of inputs	Self
Admin. Transactions	106.7 tons per trans.	1528.8 ton per trans.	37.6 tons per trans.	613.3 tons per trans	3.87 tons per trans	11.31 tons per trans

The incremental cost of smallholder contracting, by being clearly identified, can be used as a basis to influence government policy, redesign farmer structures or charge back incremental cost. The identification of start-up costs could be used by agribusiness to lobby for special relief on the basis of their role in the transformation of the agricultural sector. This relief could include favourable policy of some sort. Alternatively, this cost should be amortised over a period against the individua

farmers or a farmers association. Similarly, the incremental cost of land preparation-planting could be amortised over time. The incremental agribusiness cost of the smallholder growing-harvesting-delivery and administration activities can form the basis of redesigning contracting arrangements to reduce transaction cost or alternatively, be used as a basis to charge back incremental cost to contracted growers. The reduction of transaction cost, in this instance, could include smallholder representation by way of a farmers' association whilst charging back incremental cost could be achieved by the use of activity based costing systems (ABC) that could offset this cost against the raw commodity payments made to the contracted growers

The results of the case studies, with respect to the fourth research question, mostly suggest that smaller growers can effectively compete with larger growers and company estates-plantations on a long term basis. These findings, which are widely supported empirically can be used as a basis to convince agribusiness that small-scale growers can operate as viable business partners or, alternatively, as a basis to persuade state-donor bodies that the economic wealth of agricultural supply chains is not adversely influenced by the presence of smallholder production. This finding could also be used as a basis to efficiently unbundle company estates and promote the transformation of the agricultural sector. The results of the two sugar case studies are especially encouraging because these farmers have competed with larger growers in a commodity sector that relies on partial economies of scale. The reason for smallholder competitiveness in the sugar industry is not because of the productivity of family labour, but rather because the smallholders contracted for facilities costs more efficiently than the internalised growing facilities maintained by the company estates Smallholders, moreover, operating under the umbrella of a farmers' association, were apparently able to overcome the lumpiness of capital inputs These results would suggest that smallholder contracting could possibly be expanded to include additional commodities that were thought not to be suitable for this form of arrangement Finally, the results can be used to identify why there are cost differentials with respect to the same cost elements of the different farmer categories or, secondly, they can be used to indicate specific inefficiencies in smallholder or company production systems. The high level of overhead cost in the company estates, for instance, could prompt the need to rather contract for support facilities instead of incorporating them in the company hierarchy.

The results of the case studies, with respect to the fifth research question, largely suggest that contracting can be used as an institution to assist smallholders t overcome the barriers of entry to high value cash crop sectors. The results of the case study would also be useful to agribusiness with respect to acquiring a better understanding of the process and costs involved Smallholder contracting pr jects often involve many years of agribusiness inputs before supply commences In many instances, moreover, agribusiness is drawn into protracted equity issues involving a local community. The study identifies some of the pitfalls and hidden costs that agribusiness integrators can incur when embarking on small-scale contractin projects. The timber case study, in particular, is indicative of the difficulties of managing large numbers of micro farmers that appear to be unable to be consolidated as an economic entity. The withdrawal of the integrator financed mana ement structure, in this instance, would result in the collapse of the project and the question needs to be asked, whether or not, the micro farmers have really overcome the barriers of entry, on a permanent basis, to the timber growing industry Contracting projects ideally, should result in the establishment of permanent growers that operate as viable business entities. Whilst support in the start-up phase is a necessary pre-requisite to overcoming the barriers of entry, the contracted farmers need to be weaned from the company structure on a long term basis. Finally, the case studies provide agribu ine s with a better understanding of the motivation of smallholders, as well as the ec nomic theory that explains how the institution of contracting has allowed smallholders to overcome the barriers of entry to their industry.

The study demonstrated that a " fresh approach" to the design of smallholder contracting arrangements can be considered. This approach embraced the lessons of history, the economic rationale for contracting, the use of transaction cost the ry, tw case studies and strategic management theory, to form the basis for the design f a proposed smallholder contracting arrangement that could be applied in devel pin countries. This study proposes that the combination of approaches, linked to a unique application of transaction cost theory and organisational economics, can contr bute t a new approach to link smallholders with agribusiness The proposed m del was developed as fc ows: Firstly, a series of proposals was developed The pr p a considered the lessons of the international experience and the resu ts of t e case

studies in order to develop a series of suggestions These suggestions included ways to organise smallholder structures, to reduce transaction cost, to ensure contract enforcement and to address certain miscellaneous issues. A checklist of factors was then developed to ensure the proposals translated into economic and equity benefits to both contracting parties. Secondly, the proposed model was developed on the basis of strategic management theory that viewed the adoption of a smallholder supply contract as a strategic long term decision. The model was, therefore, constructed on the basis of the elements of the strategic process, namely, the objectives of the firm the strategy, the detailed plans, the implementation of plans and the monitoring of results. In particular, the role of government, if necessary, needs to be configured into the objectives of the proposed project model to ensure that a balance of equity-economic benefits provides an investment friendly environment for agribusiness The model, moreover, used contracting and transaction cost theory to suggest the optimum manner in which it should be co-ordinated and activity based costing was suggested as a tool to identify the differential cost of transacting with smaller growers The model also suggested that traditional discounted cash flow techniques could be used to make the final decision after subjecting the firm's cash flows to rigorous sensitivity analysis.

The study suggested that smallholders can be linked to agribusiness by way of a contracting arrangement. Further research, however, is required in order to accommodate a wider range of commodity diversity and situations in the assumptions of the proposed model. Firstly, additional case studies involving smallholder contracting arrangements in a variety of different raw commodities should be investigated to determine whether the proposed model could be flexed to accommodate these differences. Secondly, there is a need for an improved understanding of the economics and role of smallholder farmer associations in South Africa. The proposed model relies integrally on the assumption that agribusines transaction cost can be reduced by way of farmers associations and that these institutions can also create mutual asset specificity by being able to overcome capital input lumpiness. Thirdly, this study suggests there is a need for an improved understanding of the role of the new institutional economics and the economics and structures of agricultural supply chains. Finally, this study envisages the need for better understanding of black-white and gender relationships in the agricultural sector

and their impact on contracting and principal agent cost In this regard, agribusiness has a vital role to integrate black smallholders into agricultural supply chains and it is proposed that this study may should help to do this.

Bibliography

Abbott, J.C. 1994. Agricultural processing enterprises Development potentials and links to the smallholder. in *Agricultural Commercialisation, Economic Development and Nutrition* . Eds Joachim von Braun and Eileen Kennedy, John Hopkins University Press, London

Adams, C. & Goldsmith, P.D. (1999). " Conditions for successful strategic alliances in the food industry ". International Food and Agribusiness Review, 2(2) 221-248 ISSN:1096-7508.

Ahmed, R. 1994. Investment in rural infrastructure: Critical for commercialization in Bangladesh. *Agricultural Commercialization, Economic Development and Nutrition* . Eds Joachim von Braun and Eileen Kennedy, John Hopkins University Press, London.

Akerlof, G.A., 1988. The market for lemons: quality uncertainty and the market mechanism Eds. J.B. Barney and W.G. Ouchi, Jossey-Bass Publishers, San Francico

Anthony, R.J. & Govindarajan, V.,2001. *Management Control Systems* Prentice Hall Argyres, N. 1996. Evidence of the role of firm capabilities in vertical integration decisions. *Strategic Management Journal*, Feb 1996 v 17 n2 p 129 (22)

Atkins, S. & Terry, A. 1995. "The economics of sugar cane production in the Northern Lowveld of Swaziland". *Quarterly Journal of International Agriculture*, Volume 34, No. 3 July-September 1995

Atkinson, A.A., Banker, R.D., Kaplan, R.S., & Young, S M 1999 *Managerial Accounting*. Prentice Hall International

Aust, P. 1997. An Institutional Analysis of Vertical Coordination versus Vertical Integration: The case of the U.S. Broiler Industry. Staff Paper 97-24. Michigan State University.

Azzam, A. 1996. Testing the monopsony-inefficiency incentive for backward integration. *American Journal of Agricultural Economics*, Vol. 78 (3) 585-591

Babb, E.M. 1992. Management and financing and vertical co-ordination in agriculture; discussion. *American Journal of Agricultural Economics*, Vol 74 (5) 1238-1240.

Barney, J.B. & Ouchi, W.G. 1988. *Organization Economics* Eds J B Barney and W.G. Ouchi, Jossey-Bass Publishers, San Francisco

Barjolle, D. & Chappius, J.M. (2000). Transaction cost and the artisanal f od products. Institute of agricultural Economics, Swiss Federal Institute of Technolo y Zurich.

Barry, P.J., Sonka, S.T., & Lajili, K. 1992 Vertical Co-ordination, F nanc al Structure, and the Changing Theory of the Firm *American Journal of Ag c tu c Economics* Vol. 74 (1992): 1219-25

Baumol, W.J. 1997. Musings on Vertical Integration. International J urnal of S cial Economics, 1997, Vol.24 Issue 1-3, p16, 12p

Belden, S. 1992. " Vertically Coordinated Agricultural Firms Discussion American Journal of Agricultural Economics 74(1992) 1240

Binswanger, H.P. & Rozensweig, M.R. 1986. Behavioral and Material Determinants of Production Relations in Agriculture. *Journal of Development Studies* 22(3) 5 3-39

Binswanger, H.P. & Elgin, M. 1990. Reflections on Land Reform and Size *Agricultural development in the third world* John Hopkins University Pres Baltimore, 1990.

Binswanger, H.P., Deininger, K., and Feder, G. 1993 Power, distortions, revolt and reform in agricultural land relations". World Bank Discussion Paper, Washington D.C.

Boehlje, M 2000. Critical Dimensions of Structural Change. Unpublished type cr pt Department of Agricultural Economics, Purdue University. August 2000

Boehlje, M and Doering, O 2000. Farm Policy in an Industrialized A riculture *Journal of Agribusiness* Vol 18 (1). Special Issue, March 2000. 53-60

Bonnen, J.T. & Schweikhardt, D.B. 1998. The future of US agricultural policy reflections on the disappearance of the farm problem *Review of Agr c t c Economics* 20 (1): 2-36

Brickley, J.A., Smith, C.W., & Zimmerman, J.L. 2001 *Managerial Econ m n l Organizational Architecture*. 2nd Edition, McGraw-Hill Irwin, International Edit n 2001

Bundy, C. 1979. *The rise and fall of the South African peasantry* Heinemann Pre London, 1979.

Burns, J & Scapens, R.W., 2000. Conceptualizing management accountin change an institutional framework". *Management Accounting Research* (2 ( ), 11 (1) 3-27

Carney, J.A. 1988. Struggles over crop rights and labour within contract farmin households in a Gambian irrigated rice project". *Journal of Peasant Stud es* 15 (3) 334-349, April 1998.

Carney, J.A. 1994. Contracting a Food Staple in the Gambia. In Peter D Little and Michael J. Watts (eds.). *Living under Contract* The University of Wi c nsin Pres

Central Bank of Swaziland Annual Review, 1 8 , Mbabane Swa d

Chakravarti, V.K. 1999. Pepsi to experiment with contract farming on basmati pulses.*FinancialExpress*,April1999,
http://www.financialexpress.com/fe/daily 19990426 foo26031 htm

Christianson, J.K. & Mouritsen, J., 1995. Management Information Systems Computer Technology and Management Accounting *Issues in Management Accounting*. Editors D. Ashton, T. Hopper and R.W. Scapens, Prentice Hall London

Clapp, R.A. 1994. The Moral Economy of the Contract. In Peter D Little and Michael J. Watts (eds.) *Living under Contract*. The University of Wisconsin Press

Coase, R.H. 1990 (1937). " The problem of social cost", ch, 5 in R H Coase , The Firm, the Market and the Law abridged in L. Putterman (ed), *The Economic Nature of the Firm: A reader*.

Colchao, S. 1999. Will AG Banks prosper in age of vertical integration *ABS Banker Journal*, Vol. 91 (11) 26-31

Cooper, R., 1996. Costing techniques to support strategy evidence from Japan *Management Accounting Research* (1996) 7 (2), 219-47

Coppens, H., 1988. *Swaziland on the slope of a volcano*. Research reports No 33 African Studies Centre, Leiden, The Netherlands, p 8-37, 1988

Cordella, A. & Simon, K.A. (2000). "The impact of information technology on transaction and coordination cost" Department of Informatics, Goteborg University http://iris.informatik.gu.se conference iris20 30 htm

Coulter, J.,Goodland, A., & Tallontire, A. 1999. *Marrying farmer cooperation and contract farming: provision in a liberalising Sub-Saharan Africa* Overseas Development Institute, ISSN: 1356-9338, 1999. Also available as "Marrying farmer co-operation and contract farming for agricultural service provision in sub-Saharan Africa", at http://www.worldbank.org essd essd nsf agroenterprise/marrying

Currie, K. & Ray, L. 1986. On the Class Location of Contract Farmers in the Kenyan Economy. *Economy and Society*, 15: 445-75

Cutts, R. 1992. Capitalism in Japan. *Harvard Business Review*. July-August 1992 pp 48-55

D'Aveni, R.A., & Ravenscraft, D.J. (1994). " Economies of integration versus bureaucracy costs: Does vertical integration improve performance ? " Academy Management Journal, Oct 94, Vol. 37, Issue 5, p1167, 40p

Daddieh, C. K. 1994. Contract Farming and Palm Oil Production in Cote d Ivoire and Ghana. In *Living Under Contract*. Editors Peter D Little and Michael J Watts The University of Wisconsin Press

Daniel, J. 1982. The political economy of colonial and post colonial Swaziland *South African Labour Bulletin* 7.6 (1982).

Davis, C.G. and Langham, M.R. 1995. Agricultural Industrialization and sustainable development: A global perspective. *Journal of Agricultural and Applied Economic* Vol. 27(1), 21-34.

Dean, E. B., 2000a. *Transaction Cost Economics from the perspective of competitive advantage*. http://akao.larc.nasa.gov/dfc/tce.htm

Delgado,C. 1999. Sources of growth in smallholder agriculture in sub-Saharan Africa The role of vertical integration of smallholders with processors and marketers of high value-added items. *Agrekon*, Vol. 38, Special Issue, pp 165-189, May 1999

Demsetz, H., 1988. The theory of the firm revisited. *Journal of Law, Economics and Organization*. Vol. No. 4, no. 1. Spring 1988

Dietrich, M. , 1996. *Opportunism, learning and organizational evolution* Ed J Groenewegen, Kluwer Academic Publishers, Boston

Dietrich M.,2001. Accounting for the economies of the firm *Management Accounting Research*, (2001) 12 (1), 3-21

Doner, R.F. & Schneider, B.,2000. The new institutional economics, business associations and development. *Business and Society Programme*, DP 11) 2(ISBN 92-9014-619-2, First Published 2000.

Drabenstott, M. 1995. Agricultural Industrialization: Implications for Economic Development and Public Policy. *Journal of Agricultural and Applied Economics* V l 27 (1): 13-20, July 1995.

Drury, C. 1996. *Management and Cost Accounting*. International Thomson Business Press 1996.

Drury, C. & Tayles, M.,1998. Cost system design for enhancing profitability *Management Accounting Research*, Jan 1998 v 76 n1 p40 (3)

Economist Intelligence Unit. 1984. Country Report: Swaziland, 1994

Eggertsson, T. (1995). "Economic Perspectives of property rights and the economics of institutions".Ed. P. Foss, Dartmouth, Sydney. 1995

Eicher, C.K. & Staatz, J.M.1998. Agricultural transformation and rural economic development: Introduction. *International Agricultural Development* The John Hopkins University Press, Baltimore, 1998.

Fafchamps, M. and B. Minten 1999. Property rights in a flea market economy MSSD Discussion paper No 27, International Food Policy Research Institute, Washington DC. March 1999.

FAO (Council on Food, Agriculture and Resource Economics) 1994 Industrialization of US agriculture: Policy, research and education needs, Washington DC, April 1994.

Featherstone, A.M. & Sherrick, B.J. 1992. Financing Vertically Co-ordinated Agricultural Firms. *American Journal of Agricultural Economics*, Vol 74 (5) 1232-1237

Fenyes, T.I., van Zyl, J. & Vink, N. 1988. " Structural imbalances in South African agriculture". The South African Journal of Agricultural Economics, Vol 56, No 2 pp 181-194

Flaskerud, G, & Klenow,D.J. 1999. Changing the way you farm Extension program Description and evaluation. North Dakota University, Extension Report 57 September 1999, http://www.ext.nodak.edu extpubs agecon/er er57w htm

Forest Owners Association. 2001. 31st Annual Report, Forest Owners Association Rivonia, South Africa (March 2001).

Foss, P..1995. *Economic approaches to organizations and institutions* Ed P Foss Dartmouth, Sydney. 1995

Frank, S.D. & Henderson, D.R. 1992. Transaction costs as determinants of vertical co-ordination in the U.S. food industries. *American Journal of Agricultura Economics*, Vol. 74 (4): 941-950

Fronmueller, M.P., & Reed, R. 1996. The competitive advantage of vertical integration. *Omega*, Dec 1996 v24 n6 p715 (12)

Funnell, D., 1988. Water resources and the political geography of development in Southern Africa: The case of Swaziland. *Geoforum* 19: 497-505, 1988

Funnell, D. 1991. *Under the shadow of apartheid Agrarian change in Swaziland* Avebury Press, 1991

Gittinger, J.P. 1982. *Economic Analysis of Agricultural Projects* John Hopkins University Press, Baltimore, Maryland.

Glover,D. 1984. Contract Farming and smallholder outgrower schemes in less developed countries. *World Development*, 12 (11): 1143-57

Glover, D. 1987. Increasing the benefits to smallholders from contract farming Problems for farmers' organisations and policy makers *World Development* 15 (4) 441-448

Glover, D. 1994. Contract farming and commercialization of agriculture in developing countries. In: Von Braun, J. and E. Kennedy (eds) *Agricultural commercialization economic development and nutrition*. Baltimore,MD The John Hopkins University Press.

Goldsmith, A. 1985. The Private Sector and Rural Development Can Agribusiness Help the Small Farmer?. *World Development* 13 (10 11) 1125-38

Goodman, D., Sorj, B., & Wilkinson, J. 1987. From farming to biotechnology A theory of industrial development. Oxford: Blackwell.

Goodhue, R.E. 1999. Input Control in Agricultural Production Contracts *American Journal of Agricultural Economics*. Vol. 81 (3) August: 617 – 621

Gow, H.R.; Streeter, D.H. and J.F.M. Swinnen 2000. How private contract enforcement mechanisms can succeed where public institutions fail the case of Juhocukor a.s. *Agricultural Economics*, Vol. 23 Special issue 253-265 September 2000.

Groenewegen, J. 1996. *Transaction cost economics and beyond* Ed J Groenewegen, Kluwer Academic Publishers, Boston.

Groenewegen, J. & Vromen, J.J., 1996. *A case for theoretical pluralism* Ed J Groenewegen, Kluwer Academic Publishers, Boston.

Grosh, B. 1994. Contract Farming in Africa: An application of the New Institutional Economics. *Journal of African Economies,* Vol.3 (2): 231-261

Haggblade, S. 1987. Vertical Considerations in Choice-of-Technique Studies Evidence from Africa's Indigenous Beer Industry. *Economic Development and Cultural Change*, 1987, pp723-739

Hayami, Y. 1990. Assessment of the Green Revolution. In: C. Eicher and J M Staatz (eds.) *Agricultural Development in the Third World.* The John Hopkins University Press.

Hayami, Y. 1998. The peasant in economic modernization *International Agric Development.* The John Hopkins University Press, Baltimore, 1998

Hennessy, D.A. 1996. Information asymmetry as a reason for vertical integration *American Journal of Agricultural Economics*, Vol. 78 (40): 1034-1044

Hobbs, J.E. & Young, L.M. 1999. Increasing vertical linkages in agrifood supply chains: a conceptual model and some preliminary evidence. Paper presented at the Canadian Agricultural Economics Society and the World Agricultural Economics Society, Fargo, North Dakota, July 10-14, 1999

Horngren, C.T., Foster, G., Datar, S.M., & Uliana, E. 1999 *Cost Accounting in South Africa*. Prentice Hall South Africa

Hudson, D. 2000. Contracting in Agriculture: A Primer for Leaders Research report #2000-007. Department of Agricultural Economics, Mississippi State University

Huffman, W. & Just, R.E. 1994. Funding, Structure, and Management of Pub c Agriculture Research in the United States. *American Journal of Agric i tu i Economics*, Vol. 76 (4): 744-760.

Islam, N. 1994. Commercialization of Agriculture and Food Security Development Strategy and Trade Policy Issues. *Agricultural Commercialisation Le n m c Development and Nutrition* . Eds Joachim von Braun and Eileen Kennedy, John Hopkins University Press, London

Jackson, J.C. & Cheater, A.P. 1994. Contract Farming in Zimbabwe Case Studies f Sugar, Tea and Cotton. In: P. D. Little and M. J. Watts (eds) *Living Under C ntract* The University of Wisconsin Press. Madison.

Jaffee, S.M. 1994. Contract Farming in the Shadow of Competitive Markets The Experience of Kenyan Horticulture. In: P. D. Little and M. J Watts (eds) *I ving Under Contract*. The University of Wisconsin Press. Madison.

Jiggins, J. 1997. Technology development and transfer. How to maximise t e influence of the user. Swedish University of Agricultural Science http://www.ihh.kvl.dk/htm/php/tune97/1-jiggins.htm

Johnstone, B.F. & Mellor, J.W. The role of agriculture in economic development *American Economic Review*, Vol. 51 (4): 566-593

Joskow, P.J.,1988. Asset specificity and the structure of vertical relationship empirical evidence. *Journal of Law, Economics, and Organization* Vol No 4, no Spring 1988.

Kandiwa, V. (1999). Economic performance of smallholder farmers using alternative vertical coordination mechanisms for horticultural crops MS thesis, Department f Agricultural Economics, Cornell University.

Kaplan, R.S., & Atkinson, A.A., 1998. *Advanced Management Acc ount n ' ɔ* Edition, Prentice Hall International, New Jersey.

Karaan, A.S.M. 1999. Bridging the small-big divide A transaction cost appr ach t enterprise modelling for mussel mariculture in Saldanha Bay *Agrek n*, Vol 38 N 4 680-692.

Karen, R. 1985. *Agribusiness and the Small-Scale Farmer* Westview Press Inc ISBN: 0-8133-0146-7 (1985).

Karmaker, U.S., Lederer, P.J. & Zimmerman, J.L., 1990 Choosing production c ntr l and cost accounting systems. *In Measures for Manufacturing Excellence* Edit r R S Kaplan, Harvard Business School Press, Boston, Massachusetts

Kawagoe, T. 1994. Income and employment generation from agricultural pr cess n and marketing at the village level: A study in Upland Java, Indonesia In Von Braun. J. & Kennedy, E. (eds.) (1994). *Agricultural Commercialization I Development and Nutrition*. John Hopkins University Press L nd n

Kennedy, E. 1994. Effects of sugarcane production in Southwestern Kenya on income and nutrition. *Agricultural Commercialisation, Economic Development and Nutrition* Editors Joachim Von Braun and Eileen Kennedy, John Hopkins University Press London.

Kerr, J. & McDonald, S.,1994. Developed country sugar policies and the ACP countries. *Paper presented to the Agricultural Economics Society Annual Conference*, Exeter University, April 1994

Key, N. and Runsten, D. 1999. Contract farming, small-holders, and Rural Development in Latin America: The organization of agroprocessing firms and the scale of outgrower production. *World Development* Vol. 27 No 2. 381-401

Khalil, E.L., 1996. After the special nature of the firm: *Beyond the crisis of orthodox neoclassical economics.* Ed. J. Groenewegen, Kluwer Academic Publishers, Boston

Kilmer, R.L. 1986. Vertical Integration in Agricultural and Food Marketing *American Journal of Agricultural Economics*, Vol. 68 (5): 1155 1161

Kirsten, J. & Sartorius, K. 2002. Linking agribusiness and small-scale farmers in developing countries: Is there a new role for contract farming? *Development Southern Africa*, Vol.17, No. 4, October (2002)

King, R.P. 1992. Management and Financing of vertical co-ordination in agriculture An Overview. *American Journal of Agricultural Economics* 74 (1992) 1217-18

Kirsten, J. & van Zyl, J.1996. The contemporary agricultural policy environment undoing the legacy of the past. *Agricultural Land Reform in South Africa*, Oxford University Press, Cape Town, 1996.

Klein, B.; Crawford, R.G. & Alchian, A.A. (1988). " Vertical intergation, Appropriate rents and the Competitive Contracting Process ". Organization Economics " Eds J B Barney and W.G. Ouchi, Jossey-Bass Publishers, San Francico

Klug, H. 1996. Bedevilling agrarian reform: the impact of the past, present and future legal frameworks. *Agricultural Land Reform in South Africa* Editors J Van Zyl J Kirsten and H.P. Binswanger, Oxford University Press, Cape Town 1996

Korovkin, T. 1992. Peasants, grapes and corporations: The growth of contract farming in a Chilean community. *The Journal of Peasant Studies*. January, 1992, Vol 19 n 2 pp 228-253

Kumar, K. 1995. Small farmers reap benefits from USAID agribusiness programs USAID Evaluation News 1995 vol. 7. No. 1 pp 3-4

Leathers, H.D. 1999. What is Farming? Information, contracts and the Organizati n of Agricultural Production: Discussion . *American Journal of Agricultural Economics* Vol. 81(3): 621 – 625.

Levin, R.,1986. Uneven development in Swaziland: Tibiyo, sugar production and rural development strategy. *Geoforum*, 17: 239-250, 1986

Levin, R. 1988. Contract Farming in Swaziland: Peasant differentiation and the constraints of land tenure. *African Studies* 47 (2): 101-120.

Ling, K.C., & Liebrand, C.B. 1995. Vertical integration patterns of dairy co-ops reflect changing market . *Farmer Cooperatives*, September 1995 Vol 62 No 6 pp 1-8.

Little, P.D. 1994. Contract Farming and the Development Question. In: Little, P D & Watts, M.J. (eds.) *Living under contract.* Madison: University of Wisconsin Press

Little, P.D. & Watts, M.J. 1994. *Living under contract.* Madison University of Wisconsin Press.

Liu, P. & Yang, (1999). "Division of labor, transaction cost, emergence of the firm and firm size" CID Working Paper No. 10, Centre for International Development, Harvard University, April 1999

Machethe, C. Reardon, T., & Mead, D.C. 1997. Promoting farm/non-farm linkages for employment of the poor in South Africa: A research agenda focused on small-scale farms and agro-industry. *Development Southern Africa.* Vol 14, No 3, October 1997.

Mahoney, J.T. 1992. The choice of organizational form Vertical financial ownership versus other methods of vertical integration. *Strategic Management Journal*, Vol. 13, 559-584 (1992)

Mahoney, J.T., & Pandian, J.R. 1992. The resource based view within the conversation of strategic management. *Strategic Management Journal*, Vol 13, 363-380 (1992).

Martin, L. 1999. Navigating production contract arrangements Staff Paper 99-10 Michigan State University, Michigan,

Masten, S.E., 1996. Empirical research in transaction cost economics Challenges, progress, directions. Ed. J. Groenewegen, Kluwer Academic Publishers, Boston

Masuku, M. 2003. Unpublished PhD Thesis, University of Pretoria, July-2 03

Mbonga, M., van den Brink, R. & van Zyl, J.(1990). " Evolution of the agrarian structure in South Africa". Agricultural Land Reform in South Africa, Oxford University Press, Cape Town, 1996

McAfee, R.P. 1999. The Effects of Vertical Integration on Competing Input Suppliers. *Economic Review* (Federal Reserve Bank of Cleveland), 1999 1st Quarter Vol. 35, Issue 1, p2, 7p

McComb,J.R., Finlayson, M.P., Hardaker, J.B. & Heywood, P.F. 1994 The effect of a short lived plantation on income, consumption and nutrition. A case study from Papua New Guinea . in *Agricultural Commercialisation, Economic Development and Nutrition* . Eds Joachim von Braun and Eileen Kennedy, John Hopkins University Press, London.

Meliczek, H. 2000. Food technology as a means of alleviating hunger and poverty Food and Agriculture Organisation, Rome http://www.uunuu.edu/unupress/food/8F072e/8F072E01.htm

Merchant, K.A. 1998. Modern Management Control Systems, Prentice Hall, New Jersey.

Mia & Clarke. 1999. Market Competition, management accounting systems and business unit performance. *Management Accounting Research* June 1999

Milford, J. 2002. The state of value chains in the Australian sugar industry CRC Sugar Occasional Publication, Townsville, March 2002.

Minot, N.W. 1986. Contract farming and its effect on small farmers in less developed countries. MSU International Development Papers. Working paper no 31 Department of Agricultural Economics, Michigan State University, East Lansing

Ministry For Agriculture and Land Affairs. 1998. Agricultural Policy in South Africa A discussion document. National Department of Agriculture, CTP Book Printer ISBN 0-621-28815-2, Cape Town

Morvaridi, B. 1995. Contract Farming and Environmental Risk. The case of Cyprus *The Journal of Peasant Studies*, Vol. 23 (1) 30-45.

National Dept of Agriculture, 2000. Interim Statistical Data. Report number 11- 1-(1996), ISBN 0-621-29478-0, Pretoria.

Niemeijer, R. & Hoorweg, J. 1994. Commercialization of rice and nutrition A case from West Kenya. *Agricultural Commercialisation, Economic Development and Nutrition* . Eds Joachim von Braun and Eileen Kennedy, John Hopkins University Press, London

North, D.C., 1997. *The contribution of the new institutional economics to understanding of the transition problem*. UNU World Institute for Development Economics Research (UNU/WIDER), Katajanokanlaituri 6 B, 00160 Helsinki Finland

Ngquangweni, S., & Van Rooyen, C.J. 1998. Farm worker participation schemes as a mechanism for agricultural transformation. *Agricultural Policy Reform* S t

Africa. Eds. Van Rooyen.C.J., Groenewald J.A., Ngqangweni, S and Fenyes T I AIPA/Francolin Publishers, Cape Town

Pasour, E.C. 1998. The potential impact of increased vertical integration on North Carolina grain farmers North Carolina State University, December 1998 http://www.ncsoy.org/pasour2.htm

Peterson, H.C. & Wysocki, A. 1997. The Vertical Coordination Continuum and the Determinants of Firm-Level Coordination Strategy. Staff Paper 97-64, Michigan State University.

Peterson, H.C. & Wysocki, A. 1998. Strategic Choice along the vertical co-ordinati n continuum. Staff Paper 98-16, Michigan State University, East Lansing, Michigan 48824

Pitelis, C. , 1996. Seven reasons why "beyond " transaction cost economics in thesmoeconomics. Ed. J. Groenewegen, Kluwer Academic Publishers, Boston

Porter, M. 1986. *Competitive Strategy*. Macmillan Publishing, New York

Porter, G, & Phillips-Howard, K. 1997a. Contract farming in South Africa A case study from Kwazulu-Natal. *Geography: Journal of the Geographical Associati* . Vol. 82(354), Jan.1997, pp.1-38.

Porter, G & Phillips-Howard, K. 1997b. Comparing Contracts An evaluation of contract farming schemes in Africa. *World Development* 25:227-238

Pritchett, J.G. & Liu, D.J. 1998. Estimating Backward Integration in a Primary Input Market: The Case of the U.S. Hog Industry. Proceedings of the Sixth J int Conference on Agriculture, Food and the Environment, August 31-September 2 1998, Minneapolis, Minnesota.

Reardon, T. and Barrett. C.B. 2000. Agroindustrialization, globalizati n, and international development: An overview of issues, patterns, and determi ants *Agricultural Economics*, Vol. 23 Special issue, September 2000 195-205

Rehber, E. 1998. Vertical Integration in Agriculture and Contract Farming Regional Research Project NE-165: Private Strategies, Public Policies, and Food System Performance, University of Massachusetts, Dept. of Resource Economics, Amher t MA 01003

Reve, T., 1995. *The firm as a nexus of internal and external contracts* Ed P Fos Dartmouth, Sydney. 1995

Rhodes, V.J. 1993. Industrialization of agriculture: Discussion *American J urnal f Agricultural Economics*, Vol. 75 (5): 1137-1140

Ring, P. & van den Ven, A. (1992). " Structuring Cooperative Relationships Between Organizations ".Strategic Management Journal, Vol. 13, 483-498 (1992)

Rodriquez, H. 1996. Vertical Integration: A complete and complex approach t logistics in the frozen food industry. *Frozen Food Digest*, Dec 1996 v 12 n2 p(1)

Rosen, S. (1988). "Transaction costs and the internal labor markets" Journal of law economics, and Organization, vol. 4, no.1, Spring 1988 pp49-63

Rouse & Putterill., 2000. Incorporating environmental factors into a highway maintenance cost program. *Management Accounting Research*, September 2 0

Rowlinson, M.J. 1997. *Organisations and Institutions* Macmillan Press, Lond n

Royer, J.S. 1995. Potential for cooperative involvement in vertical coordination and value added activities. *Agribusiness*, Vol. 11(3): 473-481.

Rudolph, D. 1999. Vertical organization of agribusiness in transition economies Hungarian production systems or agricultural franchising ?. *Agribusiness*, Vol 15, No.1, 25-40 (1999)

Runsten D. & Key, N. 1996. Contract Farming in Developing Countries Theoretical aspects and analysis of some Mexican Cases. Research Report No 3, August 199(Report prepared for the United Nations Economic Commission for Latin America and the Caribbean, Santiago, Chile.

Russell, M.,1993. Are households universal? On misunderstanding domestic groups in Swaziland. *Development and Change* 24, 755-785, 1993

Ruth, M. ; Cloutier, L.M. & Garcia, P. (1998). " A non linear model of information and coordination in hog production; testing the Coasian-Fowlerian dynamic hypotheses". Paper: American Agricultural Economics Association, Salt Lake City, UT, August 2-5, 1998

Ruttan, V.W. 1980. Models of Agricutural Development Society 17, No 6 Copyright @ 1980, Transaction Publishers.

Ruttan, V.W., & Hayami, Y. 1990. Induced Innovation Model of Agricultural Development. In: C. Eicher and J.M. Staatz (eds). *Agricultural Development in the Third World*. The John Hopkins University Press, Baltimore

Sartorius, K & Kirsten, J.F. 2002. Can small-scale farmers be linked to agribusiness The timber experience. *Agrekon* December 2002.

Schirmer, S.(2000). The Time of Decline: Black Agriculture During the Period 192(- 1979. Unpublished Study.

Schrader, L.F. 1986. Responses to forces shaping agricultural marketing Contractin *American Journal of Agricultural Economics*. 68 (5) 1161 - 1167

Schrader, L.F., & Boehlje, M. 1996. Co-operative Co-ordination in the H -Pork system: Examples From Europe and the U S. Staff Paper 96-21, September 1(Purdue University, Department of Agricultural Economics, Ind ana

Schultz, T.W. 1998. Investing in People. *International Agricultural Development* The John Hopkins University Press, Baltimore, 1998

Seifert, E.K. & Priddat, B.P. (1995) "The transaction cost approach to New Institutional Economics: A generalization and critique" http www.wiwi.uni-regensburg.de ~grj22307 abstr3.htm, Marburg, 1995

Sofranko,A.; Frerichs, R.; Samy, M. and Swanson, B. 2000. Will farmers organize? Structural change and loss of control over production http://web.aces.uuiuc.edu/value research/organize.htm

Sporleder, T.L. 1992. Managerial Economics of Vertically Coordinated Firms *American Journal of Agricultural Economics* Vol.74. 1226-1230

Stanton, J.V. 2000. The role of Agribusiness Development: Replacing the diminished role of the government in raising rural incomes. *Journal of Agribusiness*, Vol 18 (2) 173-187. Spring, 2000.

Strathdee, S.,1990. *World market situation and Outlook* Paper presented to the 4th World Sugar Farmers Conference, organized by the World Association of Beet and Cane Growers, Westin Hotel, Winnipeg, Canada, 9-13 July, 1990

Swaziland Sugar Association Annual Review, 1993, Mbabane

Timmer, C.P. 1990. The Agricultural Transformation. *Agricultural Development in the Third World.* Editors Carl. C. Eicher and John M. Staatz, The John Hopkins University Press, 1990.

Tregurtha, N.L. & Vink, N. 1999. Trust and supply chain relationships A South African case study. *Agrekon.* Vol. 38 (4): 755-765

Unneveher, L.J. 2000. Food safety issues and fresh food product exports from LDCs *Agricultural Economics.* Vol.23 (September 2000) 231-240

Van den Brink,R., de Klerk, M., & Binswanger, H 1996. Rural Livelehoods. fiscal costs and financing options. *Agricultural Land Reform in South Africa* Eds J van Zyl, J. Kirsten and H.P. Binswanger. Oxford University Press, United Kingdom

Van Rooyen, J. 1999. Agricultural partnership schemes as a mechanism for transformation and development. Paper presented at the 3rd regional conference of Initiative for the Development and Equity in African Agriculture (IDEAA). Durban. 4th February, 1999

Van Rooyen, C.J., Ngqangweni, S. & Sartorius, K. 1999. Agribusiness partnership schemes as a mechanism for participation, transformation and development Proceedings of 33rd Conference of the South African Society for Agricultural Extension, 11-13 May, 1999. Bloemfontein, South Africa

Van Zyl, J.1996. The farm size efficiency relationship *Agricultural Land Reform in South Africa*, Oxford University Press, Cape Town, 1996.

Van Zyl, J. & Kirsten, J. 1999. Approaches and progress with land reform in South Africa. *Agrekon* Vol. 38, May-June 1999, pp 326-342

Van Zyl, J., Kirsten, J. & Binswanger, H P. 1996. "Introduction". Agricultural Land Reform in South Africa. Oxford University Press, Cape Town, 1996

Vellema, S. 2000. Technology and control in Philippine contract farming the cases of asparagus production and maize seed production . *International Journal of the Sociology of Agriculture and Food*, vol. 8, 1999

Vergopoulos, K. 1985. The End of Agribusiness or the Emergence of Biotechnology? *International Journal of Social Science* 37.389-400

Von Braun, J. 1990. Introduction and Overview. *In Agricultural Commercialisation Economic Development and Nutrition* . Eds Joachim von Braun and Eileen Kennedy. John Hopkins University Press, London.

Von Braun, J. & Kennedy, E. 1994. *Agricultural Commercialisation, Economic Development and Nutrition*. John Hopkins University Press, London

Von Braun, J., & M.D.C. Immink 1994. Non-traditional Vegetable Crops and Food Security among Smallholders in Guatemala. In: Von Braun, J. & Kennedy, E (eds) *Agricultural Commercialisation, Economic Development and Nutrition* John Hopkins University Press, London.

Walker, M., 1998. Management accounting and the economics of internal organization". *Management Accounting Research*, March 1998

Watts, M.J. 1994. Life under contract; Contract farming, Agrarian Restructuring, and Flexible Accumulation. In. Peter D. Little and Michael. J Watts (eds) *Living Under Contract.* The University of Wisconsin Press. Madison.

Weatherspoon, D.; Cacho, J and R. Christy 2001. Linking globalization, economic growth an poverty: Impacts of agribusiness strategies on sub-Saharan Africa *American Journal of Agricultural Economics*. Vol 83(3). August 2001.722-729

Westgren, R.E., 2000. *The strategic alliance formation: resources, rents and property rights.* Paper presented at the annual research conference of the Food and Agricultural Marketing Policy Section of the American Agricultural Economics Association, Florida.

Williams. S. 1985. The Mumias Sugar Company: A nucleus estate in Kenya *Agribusiness and the Small-Scale Farmer*. Westview Press, Boulder. Colorado. Inc. ISBN: 0-8133-0146-7 (1985).

Williamson, O.E. 1975. *Markets and Hierarchies*. New York. Free Press

Williamson.O E. 1979. Transaction cost economics the governance of contractual relations. *The Journal of Law and Economics*. 22(2): 233-261.

Williamson, O.E., 1981. The economics of organization. The transaction cost approach. *American Journal of Sociology* 87: 548-577

Williamson, O.E. 1985. *The economic institutions of capitalism: Firms, Markets and Relational Contract*. New York: The Free Press

Williamson, O.E., 1986. *Economic Organization: Firms, markets and policy control* Wheatsheaf Books Ltd ISBN 0-7450-0015-0

Williamson, O.E., 1988. The logic of economic organization. *Journal of Law Economics, and Organization.*, vol. No. 4, no. 1, Spring 1988

Williamson, O.E. 1995. Transaction Cost Economics and Organization Theory In O.E. Williamson (ed.), *Organization Theory: From Chester Barnard to the Present and Beyond.*, expanded edition (Oxford University Press)

Williamson, O.E., 1996. Efficiency, Power, Authority and Economic Organization Ed. J. Groenewegen, Kluwer Academic Publishers, Boston.

Williamson, O.E. 2000. The new institutional economics: taking stock, looking ahead *Journal of Economic Literature*. Vol XXXVII (September 2000) pp 595-613

Wolz, A., Kirsch, O.C 1999. Equitization of agribusiness in Vietnam Options for small-scale farmers with special emphasis on coffee production in Daklak Province. Discussion Paper No. 69. Research Centre for International Agrarian and Economic Development. Heidelberg, Germany, February 1999 http://www.rzuser.uni-heidelberg.de/~t08 diskus69.htm

Zhong, T, Rozelle, S., Stone, B., Dehuua, J. Jiyuan, C & Zhikang, X 1994 Chinas Experience with Market Reform for Commercialization of Agriculture in Poor Areas.

Zylbersztajn, D. & Farina, E..1999. Strictly coordinated food systems: exploring the limits of the Coasian Firm. *International Food and Agribusiness Management Review*. 2(2): 249-265. ISSN: 1096-7508