Chapter Four: A Conceptual Framework for Case Study Applications

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.