STRUCTURAL CHANGE IN AGRIBUSINESS: THE CASE OF POTGIETERSRUSSE TABAK KOÖPERASIE (PTK)

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In response to the structural changes in the South African agricultural sector, Potgieterusse Tabakkoöperasie (PTK) extended its operations to include marketing activities. This article introduces the theme of structural change/industrialisation in the South African agricultural sector and explores the complexity of structural options and decision-making variables that managers have to face when considering vertical expansion. A case study approach is followed at the hand of new institutional economics to explain strategic choices by PTK management. The results from organisational theory and transaction cost theory, as applied to the same problem, yields complimentary and robust results.

1. INTRODUCTION

The South African agricultural industry is undergoing major structural changes, as is seen in the changes in product characteristics, production and consumption patterns, technology, the size of operations (Kirsten & Vink, 1999) and the relevance of "supply chain" or "added value" integration (Van Rooyen *et al,* 2000). Tom Urban coined the phrase "the Industrialisation of Agriculture" at the turn of the previous decade to describe similar changes in the American agricultural sector, whilst Zuurbier (1999) described similar trends in Dutch agribusiness. Agricultural industrialisation describes the trend towards economics of scale through the movement to larger production units and the increasing occurrence of vertical co-ordination and integration between the various stages of the food and fibre system i.e. the supply chain (Antonovitz *et al,* 1996). Boehlje (1996) defines industrialisation as the application of modern manufacturing, production, distribution and co-ordination methods to the food supply chain. The Council of Food, Agriculture and Resource Economics defines industrialisation of agriculture in Sonka (1995) as an increasing concentration of farms and vertical co-ordination (contracting and integration) among the various stages of the food and fibre system. The emerging system is expected to be highly competitive in global markets, more efficient, more responsive to consumer demands, less dependent on government assistance, and more able to rapidly adopt new technologies.

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These trends have not yet been adequately researched by South African agricultural economists. The purpose of this article is therefore to (1) introduce the theme of structural change/industrialisation in South African Agribusiness and (2) explore, at the hand of a case study, the complexity of structural options and decision-making variables that managers have to face when considering vertical expansion.

The case study focuses on the vertical integration of the Potgietersrusse Tabak Koöperasie (PTK) to extend value adding by including marketing activities to their operations.

2. EXTENDING AGRICULTURAL ECONOMIC METHODOLOGY

Agricultural economic analysis is increasingly concerned with the application of economic analysis to the managerial decision making within firms (Boehlje, 1996). This poses special challenges to the research methodologies applied in understanding how decisions are taken within the firm i.e. the so-called "black box". The motivations and strategies underlying 'real world' decisions are far more complex than "maximise profits" or "minimise costs". Case study research, as a scientific research strategy for collecting data and testing theory, has been employed and tested in a wide range of scholarly and problem-solving situations (Sterns *et al.* 1998). The results of a specific firm is not generalised for the rest of the industry, but serves as a tool to gain insight into the case firms' decisions, to provide opportunities to broaden and enlighten understanding, or to test current theory of firms and decision making processes. The validity of non-statistical inferences as discussed by Kennedy in Sterns *et al.* (1998) in the use of case studies should be noted.

Case studies are viewed as an appropriate research strategy when research questions are related to the "how" and/or "why" of phenomena, when controlling the contextual variables is not an option, and the relevant time frame is the present. Yin (in Sterns *et al.* 1998) suggests that the suitability of a given research strategy depends upon three parameters: (1) the research question being asked, (2) the need for control over contextual variables, and (3) the time frame encompassing relevant events.

The case study in this paper was developed over a two-year period of involvement by the authors with the firm through strategic decision facilitation. In this article, the decisions taken by management, based on their understanding of the relevant business environment, is conceptualised and elucidated by means of applicable economic theory.

3. BACKGROUND

The town Potgietersrus was established by the surrounding farming community in 1852, abandoned in 1870 due to disputes with the local population, and once again re-populated again in about 1886-1890. Various hardships such as "Runderpest", the Anglo-Boer war and the Rebellion befell the inhabitants of the region, including the "Great Depression" of 1933 (PTK 1966). On 14 June 1933 forty-six farmers founded the co-operative to organise farmers to build up negotiation power *"…om saam te staan en só bedingingsmag op te bou…"* (PTK, 1966). Against this background it is clear that PTK was established in a time of social hardship to counter the effects of unfavourable economic and social circumstances facing agricultural producers and rural inhabitants. The co-operative was formed to support its members by extending their activities and control over the product from production to include assembly, grading, packaging and auctioning.

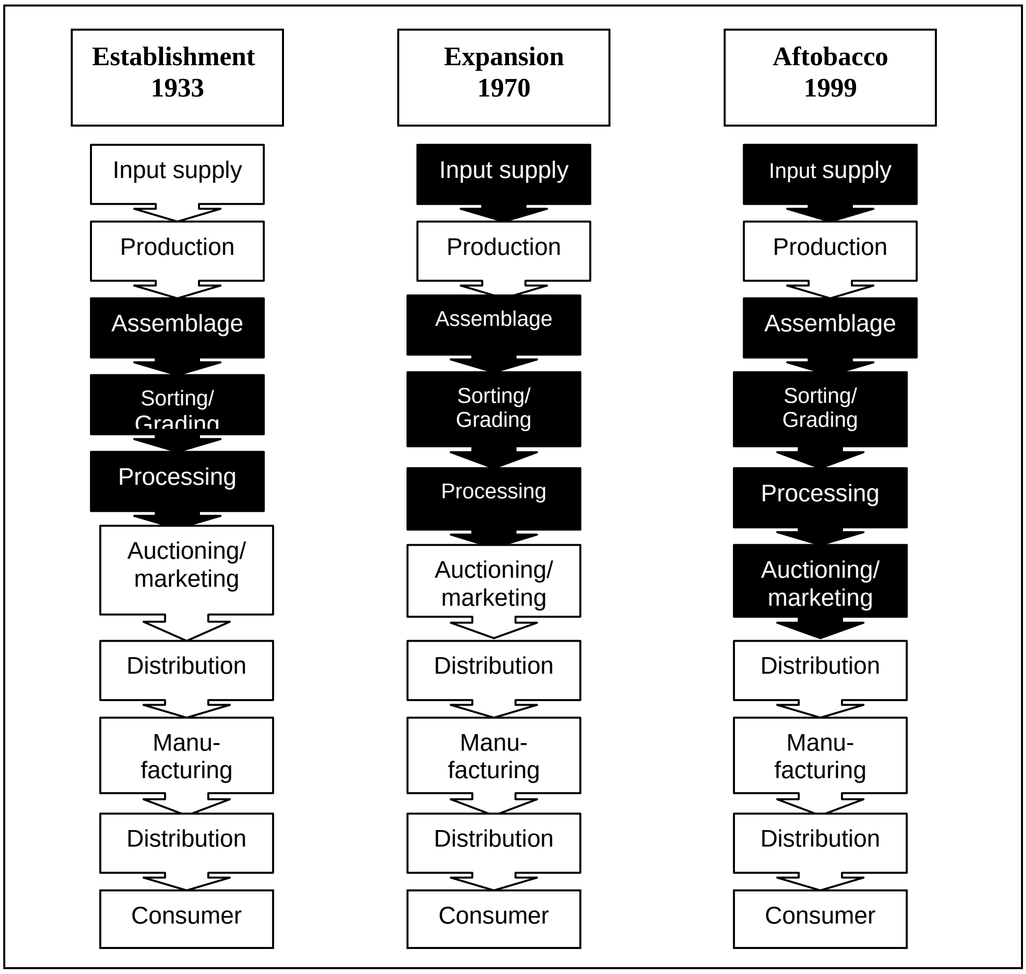

Figure 1: Integration performed by PTK

Overproduction, variable supply, and low export prices - always the bane of the farming sector - had to receive attention by the new co-operative. In 1939 drastic measures were considered to limit the oversupply of tobacco. The co-operative requested the Department of Agriculture to prohibit settlers to produce tobacco and it was even suggested to burn a part of the export quota!

Over the next few decades PTK established itself as an effective producers co-operative under the co-operative act. The early 1980's, however, introduced substantial reforms in the agricultural environment (Van Rooyen *et al.* 1997).

The Board of Directors of PTK called a extraordinary general meeting on 4 December 1998 to discuss the formation of a joint marketing company. Increasing pressure in the marketing of tobacco in the free market environment, anti-smoking legislation, and the onslaught on the RSA tobacco industry were cited as the reasons for the initiative. More specifically the co-operative was experiencing rising input costs, stronger competition in the global marketing of relatively low volumes of tobacco in comparison to the total market and increasing unit costs. (PTK annual reports).

The Board of Directors proposed the establishment of a joint marketing company with international experts. The envisaged results of this action were (PTK Annual Report 1999):

- training and knowledge expansion of PTK personnel to international standards by international experts;

- assistance with development of tobacco production in South Africa and other Africa countries;

- aggressive co-operation and assistance with possible production expansion by PTK members and other producers; and

- most importantly the procurement of unprocessed tobacco from African countries for processing and packaging in the PTK plant.

PTK expanded its production facilities substantially in terms of this "supply chain" vision. Increased throughput in the expanded processing facility is important to reduce unitary production costs or to realise favourable scale economics in manufacturing. The success of the vertical integration or supply chain strategy is therefore directly linked to the success of the expansion in processing and marketing capacity.

Important aspects of the operational agreements between PTK and the new marketing company were (PTK Annual Report 1999):

(1) equally shared accountability and contribution by both partners;

(2) PTK members are still contractually bound to production credit agreements to deliver their total harvest to the co-operative;

(3) the marketing company must set up an agreement with PTK with regard to the packaging and processing of tobacco;

(4) the marketing company is responsible for the marketing of the total production by PTK members whether in South Africa or not;

(5) profit is shared equally and consequently to PTK members through dividends/bonuses after PTK reserves have been attended to;

(6) tobacco form producers that are not members of PTK can also be procured for processing and packaging by the PTK processing plant; and

(7) separate agreements are applicable for tobacco processed by PTK for PTK members and processed by PTK for other suppliers.

A new company, Aftobacco (Pty) Ltd was consequently set up with two tobacco traders as partners. The tobacco chain and the different integration by PTK are indicated in figure 1.

4. THEORETICAL OVERVIEW

Williamson (1999) identifies four levels of research relevant to the economic inquiry into institutions. The first level deals with the informal institutions, traditions and norms that govern society for which social theory is of particular relevance. The second level address the institutional environment i.e. the 'rules of the game' for doing business, for which the economics of property rights and positive political theory are generally applied. Thirdly, governance structures related especially to the way firms align governance structures to transactions are analysed at the hand of transaction cost economics. Finally, neo-classical economics and agency theory is used to explain and predict the allocation and employment of resources within the firm. As noted earlier the objective of this article is to explore the governance structures of firms in the agribusiness complex, which would specifically relate to the third level of economic enquiry in institutions.

Vertical integration can be defined as the consolidation of two successive production processes in which the output of the upstream stage is used as one intermediate input in the downstream stage. This consolidation removes the need for contractual and open market exchanges between upstream and downstream firms. These exchanges are replaced by internal exchanges within the consolidated firms. Such a vertical integration implies ownership and complete control over neighbouring stages of production and distribution. Various degrees of vertical co-ordination exist between the extremes of vertical integration and an open market. (Antonovitz *et al* 1996)
From a conceptual point of view it is first and foremost important to understand the incentives for structural change in the tobacco industry. Industries integrate vertically for various reasons. Cole in Mallen (1967) identified thirteen advantages to vertical integration for the enterprise: additional profit margins; decreased marketing expenses; stability of operations; certainty of materials and supplies; better control of product distribution; gratification of personal ambition; quality control of produce; prompt revision of production and distribution policies; better inventory control; ability to apply brand names to items produced and to enjoy the advantages thereof; opportunity for increased research facilities; greater buying power; and the ability to secure better trained personnel. He added that lower prices, maintenance of quality and better servicing of products would be the benefits that would accrue to the consumer through vertical integration (Cole in Mallen, 1967).

Ward (1997) sorted the motives for vertical integration into seven classes: decreased transaction costs; decreased risk and uncertainty; assured input or output supplies; corrected market failures; countered market power at an adjacent stage; created or extended market power; and avoidance of government restrictions, regulations or taxes.

Baumol (1997) limits the explanations for vertical integration to three basic motives: technical economics of scope; economics of internal production resulting from market failure; and the pursuit of aggrandisement or monopoly power

Secondarily, it is important to understand how the firm integrates vertically. As already indicated various degrees of vertical integration exist between the open market and total integration. However, it is not possible to explain the eventual structure at the hand of a single theory (Boehlje, 1999). Various disciplines, such as, value-chain analysis; economic theory, including transaction cost and principle agent concepts; strategic management and organisational learning; and negotiation/power, trust, and performance incentives, make valuable contributions to explaining vertical integration models. Transaction cost and strategic management theories are particularly relevant to the Potgietersrusse Tabak Koöperasie and will received due attention.

Transaction cost (and principal-agent) theory indicates that structure in terms of the form of vertical linkages or governance in an economic system depends not only on economies of size and scope, as suggested by conventional theory, but also on costs incurred in completing transactions using various governance mechanisms. The form of co-ordination governance will be determined by the characteristics of the transactions and the industry as per the asset specificity, task programmability, and task separability. Asset specificity refers to the unique nature of the assets (physical and human) required for the transaction to occur. The more unique (specific) an asset is, the higher the need for co-ordination between agents in the supply chain. Task programmability indicates the extent to which the parties understand the transaction and how often it is repeated. As the need for intensive negotiation and discussion related to a transaction diminishes, the governance mechanism approaches impersonal co-ordination mechanisms such as the open market. Seperability indicates the ability to determine and measure the value of the contribution and consequent reward that should be given to the respective participants in the transaction. (Boehlje, 1999) Organisational forms can be predicted by the transaction cost theory as indicated below.

Table 1: Predicted organisational forms of alternative business linkages (transaction economic theory)

Factors	Low Programmability		High programmability	
	Low asset specificity	High asset specificity	Low asset specificity	High asset specificity
Low non-seperability	Spot market	Long term contract	Spot market	Joint venture
High non-seperability	Co-operation (strategic alliance)	Co-operation or vertical ownership	Inside contract	Vertical ownership

Source: *Boehlje, 1999*

According to strategic management theory governance structures are determined by (a) internal considerations of costs, technology, risks, and financial and managerial resources and (b) external competitive considerations of synergies, differentiation, and market power and positioning (Harrigan in Boehlje, 1999). Harrigan (1983) identified bargaining power, strategy objectives, and industry traits (competitive position) as relevant to vertical integration strategies and proposed the following conceptual model for predicting vertical integration strategies within established industries:

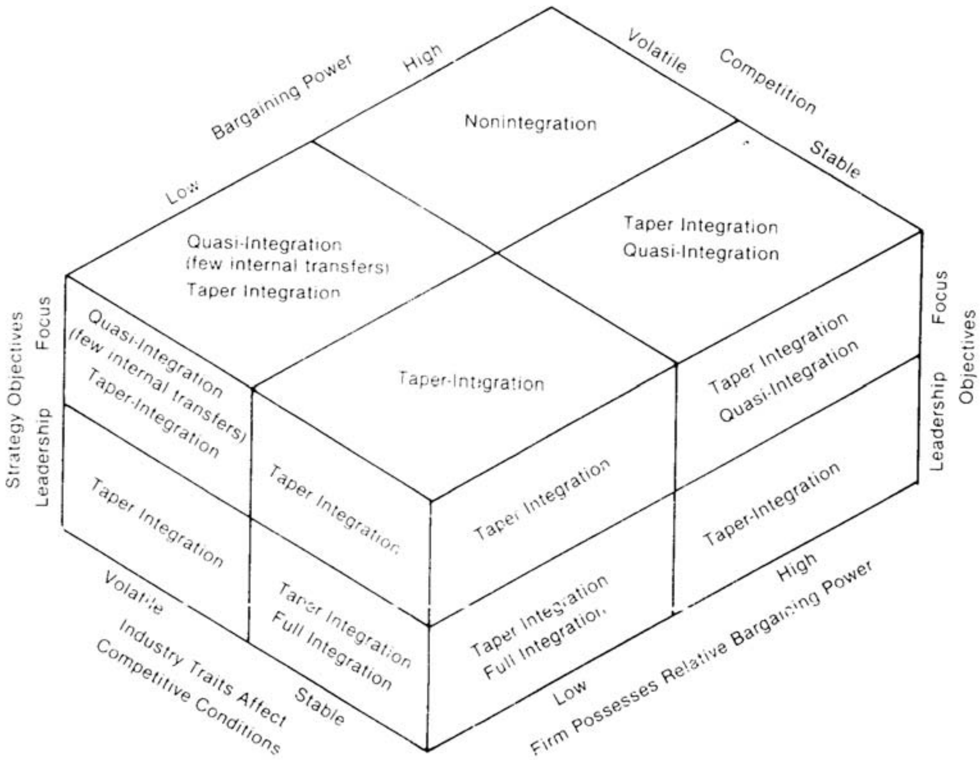

Figure 2: Illustration of the strategy framework for vertical integration within established industries

Source: *Harrigan, 1983*

5. TOBACCO AGRIBUSINESS: APPLICATION AND OBSERVATIONS

PTK embarked on the road of vertical integration to secure additional profit margins through decreased marketing expenses, higher throughput in the processing plant, and expanded markets.

Marketing expenses would be addressed in several ways. Technically the firms would avoid the costs incurred when delivering the tobacco to the auctions by delivering it directly to the buyers. These savings would be expressed in a competitive price position for the companies on the basis of reduced costs in the supply chain. The firms would be able to extract first mover, information and flexibility advantages from improved knowledge of both the (international) market information and (on-farm) supply conditions by linking the intelligence systems of producers and traders in the same company. Information advantages would also counter the effects of market failure. At the manufacturing and auctioning stages of the tobacco chain oligopoly to monopolistic conditions did and still does exist. The initiative would counter market power in adjacent levels by efficiently addressing niche markets with a specialised product.

Ensuring a higher throughput for the processing plant would be imperative to extract technical economics of scale. The marketing company could reduce risk at the input and output sides of the processing stage by ensuring higher and more secure levels of product and thus ensuring high and constant delivery volumes that are required by manufacturing firms. The output of the firm would also be assured with a market to avoid inventory risk associated with non-sales of stock.

Expanded markets beyond South Africa could provide new marketing opportunities to PTK. However, when we mention expansion of markets one has to consider the aspect of aggrandisement or efforts to establish monopoly powers as mentioned by Baumol (1997). The question therefore: Is the vertical integration initiate an investment in management ego or is it based on sound decision making principles? Realistically one has to assume that there would always be a measure of managerial ego involved in these kind of decisions.

The vertical integration venture would also provide opportunity for better co-ordination between the market and the farmers. Information exchange would therefore be facilitated in the organisation leading to improved flexibility to realise market opportunities. Venter (1999) indicated that various initiatives have been launched in the South African tobacco industry to amalgamate some of the tobacco co-operatives.

The tobacco produced by PTK members is air cured in contrast to the more prevalent flue (oven) cured tobacco. The market perceives air cured tobacco as easier to handle due to its leathery texture and more aromatic particularly for pipe tobaccos, it therefore make sense to strive to service niche markets with a niche product through implementing systems which do this as efficiently as possible. In this light it is clear that more advantageous scale economics could be realised, but PTK opted for the niche approach, while realising that in this process scale economics must be realised.

Chandler emphasised that structure follows strategy, and the management and directors of PTK had to identify an efficient structure to realise their objectives as efficiently as possible. From a transaction cost perspective PTK faced high asset specificity. An investment in tobacco grading, sorting and processing equipment was not transferable. Due to the location and socio-economic circumstances in the town of Potgietersrus any fixed infrastructure of the size and nature necessary to realise economics of scale and scope, would also have to be highly specific since there is no market in the town for fixed infrastructure of this nature. It is therefore clear that investment in the initiatives of PTK would be highly asset specific. As a consequence the risk associated with these investments would increase accordingly.

The transactions in the supply system are highly programmable due to their repetitiveness. The transactions can actually be facilitated through a low input system like an open market, which has been the system for the marketing of tobacco to date. A measure of uncertainty exists in regard to the non-seperability of transactions between the grading, processing and packaging functions and the marketing function.

The value added by sorting and grading is clear and relatively easy to quantify. The value added by marketing is not that easy to quantify, and varies according to the success of the enterprise. The division of the benefits of the initiative is therefore problematic.

A joint venture or vertical ownership is the most efficient governance systems to facilitate the tobacco market chain for a niche market as indicated in table 1. The management also has to take the strategic environment into account in terms of strategic objectives, bargaining power, and competition in the industry.

PTK leadership opted for a strong strategy focus on the niche marketing of air-cured tobacco. The bargaining power of PTK is low in the industry since it is closely linked to the production of tobacco which takes place in a nearly perfect market. Bargaining power will increase as the initiative develops, but it will remain essentially small within the global tobacco market. Since the tobacco market is mature the competitive conditions in the industry is stable.

Given these factors it would have made sense to implement taper integration as a vertical integration strategy (Harrigan 1983). Taper integration means that the firm would produce a portion of its requirements internally but purchase the rest on the open market. Taper integration would give the firm the advantage of full-capacity utilisation through fully utilising its own production, while external suppliers would be approached if excess capacity exists. (Harrigan, 1983) This is also thus governance structure that PTK implemented.

6. CONCLUSION

It is necessary to describe and analyse managerial decision making in the 'real world' from an economic point of view. The results from two approaches to the same problem yielded complimentary and robust results.

Economic theory is beneficial to the elucidation of managerial decision making. However, it was clear that multiple theories, and not exclusively 'pure' economic theory, is necessary to explain the complexity of managerial decision making successfully. New Institutional Economics and especially Transaction Cost Theory should enjoy more attention in the field of agricultural economics in order to understand and explain aspects relating to the structure and efficiency in agricultural supply chains. The case study approach will assist in this particular challenge.

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