

**VERTICAL INTEGRATION AND
PERFORMANCE OF FOOD
MANUFACTURING FIRMS IN NAIROBI**



**BY
MAHAGA DONALD F.M**

**SUPERVISOR:
DR. MARTIN OGUTU**

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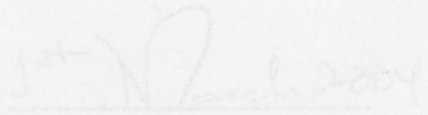
DEDICATION

To my late father Fabianus Mahaga Mudong'i may his soul rest in eternal peace.

This management research project is my original work and has not been presented for a degree in any other university



MAHAGA DONALD F.



DATE

This management research project has been submitted for examination with my approval as University Supervisor



Dr. MARTIN OGUTU



DATE

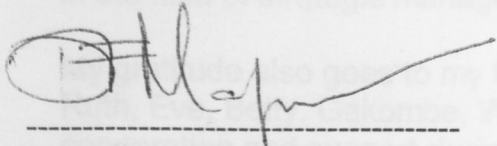
DECLARATION

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I wish to express my gratitude to my supervisor Dr. M. Ogutu for his invaluable guidance, support and encouragement throughout the study and indeed the

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MAHAGA DONALD F.

1st March 2004

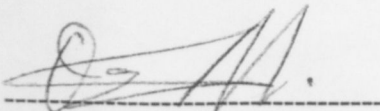
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My gratitude goes to my friend Martin Mbugo for having encouraged me to pursue the MSc course, James Mgori and Fidelis Nguni for their assistance in this endeavor.

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This management research project has been submitted for examination with my approval as University Supervisor.



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ABSTRACT

1.1 BACKGROUND

This study sought to establish the relationship between the degree of vertical integration and performance in food manufacturing firms in Nairobi. It examined the correlation between profitability performance ratios return on assets, return on investment and net profit margin individually vis-à-vis the degree of vertical integration as indicated by extent of a firm's value addition.

A cross sectional survey was carried out on seven food manufacturing firms in Nairobi in the year 2000 consisting of five firms listed on the Nairobi Stock Exchange and two to unlisted firms. An analysis using secondary data from financial reports was done to establish each firm's degree of vertical integration, its three common profitability performance ratios, and finally the relationship between the degree of vertical integration and each of the profitability performance ratios. The findings suggest that a firm's performance was moderately positively associated to it's degree of vertical integration. Further the study suggests that a change in the degree of vertical integration accounted for between 24.4% to 39.7% of the total change in profitability of a firm.

The results showed that there was a positive correlation between the degree of vertical integration and the profitability performance of firms in the food manufacturing industry in Nairobi area in the year 2000. The implications of this study are that food manufacturing firm policy makers and managers in Nairobi area should create and adopt policies that take cognisance of and that facilitate vertical integration as a possible strategy, since it is likely to result in improved profitability performance.

1. INTRODUCTION

1.1 BACKGROUND

Strategy may be seen as an organization's large-scale, future oriented plans for interacting with the competitive environment to optimise achievement of the organisation's objective (Pearce II and Robinson, 2002). Mintzberg (1994) sees strategy as being the pattern from a stream of decisions taken by an organization over a period of time and consisting of both deliberate and emergent qualities since all strategies must combine some degree of flexibility with some degree of control. Strategies adopted by organizations may be broadly divided into two, namely, business level and corporate level strategies. Business level strategies are the specific strategies that a firm may pursue within a particular market or industry to gain competitive advantage, on the other hand corporate strategies are the strategies that a company may use to leverage it's traditional resources to gain competitive advantage and economic profits by entering new markets and industries (Barney, 1998).

Porter (1980) states that there are three generic business strategies namely cost leadership, differentiation and focus. Cost leadership requires the aggressive construction of efficient scale facilities, vigorous pursuit of cost reduction e.t.c to achieve the lowest possible per unit cost (Porter, 1980). Differentiation involves the differentiation of a product by creating something that is perceived industry wide as unique from a design, brand technology dealer network e.t.c perspective (Porter, 1980). Focus strategy involves focusing on a particular group, segment of product-line, geographic market and rests on the premise that the firm is better able to serve its narrow strategic target more efficiently and effectively (Porter, 1980). Corporate level strategies seek to deal with ways in which the corporate parent firm may add value to its business units, the logic on which the corporate portfolio will be based on, the nature of corporate parent control on business units and, the nature and extent of diversity of the corporation (Johnson & Scholes, 2002). Among the specific corporate strategies that a corporation may opt to use at this level is vertical integration.

Vertical integration is one among corporate strategies that firms may adopt to either improve on their performance or make them more competitive. The strategy involves the acquisition of businesses that serve as a firm's suppliers of inputs or a firm's consumer of its finished products, viewed this way it presents firms with a choice about which value adding stages from the raw-material-to-consumer chain to compete in (Charles and Gareth, 2001). A firm that acquires its supplier e.g. a garment manufacturing firm that acquires its textile producer may be seen to be engaging in backward vertical integration whilst one that acquires the distributor of its finished products e.g. the garment firm acquiring a supermarket firm currently distributing its garments is seen to engage in forward vertical integration (Pearce and Robinson, 2002).

Alternatively the firm may set up and start its own operations instead of acquiring those of its suppliers and distributors respectively. Besides being forward or backward integrated a firm may also be either *full* or *tapered*. A company is full when it produces all of a particular input needed for its operations or when it disposes all its outputs through its own operations. On the other hand, tapered integration occurs when the company buys inputs from independent suppliers in addition to its own company owned supply or it disposes its outputs through other outlets in addition to its own (Charles and Gareth, 2001). Vertical integration strategy has the effect of extending the firm's competitive scope within the same industry (Grant, 1998).

Integration may involve the use of existing technology or a modification of technology, which may then result in foreclosure of competitors leading to competitive advantage (Avenel and Barlet, 2000). The decision as to whether to integrate or not may be based on the difference in carrying transaction costs between firms and the bureaucratic costs within the firm, create market barriers, reduce dependencies with exchange partners, facilitate price discrimination e.t.c. The degree of integration also depends on the profitability activities in the value

chain et.c. Integration may also be seen as a particular type of diversification. Rumelt (1974,1982) found that a firm's diversification must show evidence of relatedness before profit increases are observed thus justifying the need for some amount of vertical integration before embarking on unrelated diversification.

Performance on the other hand may be seen as the actual growth in the wealth of a firm. Traditionally performance has referred to real financial returns that lead to growth and long-term economic value, which encompasses both the desire for short-term profitability and long-term desire for growth. Coase (1937) defines an organization as "nexus of contracts" among owners of capital, labour, managers and other productive assets. Barney (1997) further states that the owners of those productive assets will only make the assets available to the organization for use if they are satisfied with the income they are receiving and in particular if it is at least as large as they could expect from reasonable alternatives.

D'Aveni and Ravenscraft (1994) found that "Vertically integrated lines of business economized on general and administrative, other selling, advertising, and R&D expenditures, but had higher production costs and thus only marginally better profitability than non-integrated lines of business in the same industry." Vertical integration, due its high degree of internal transfers can reduce costs because of the economies achieved from avoiding transaction costs and market exchanges, exploitation of opportunities for coordinating internal activities and the creation of power over buyers and suppliers. It is therefore expected that the degree to which food manufacturing firms in Nairobi will be vertically integrated will be related to the performance of the firms.

1.2 OVERVIEW OF FOOD MANUFACTURING FIRMS IN KENYA

In 1998 manufacturing accounted for 14% of gross domestic product of the Kenya (GOK, 1998a), however the annual growth rate in the sector has slowed down from 5.2 % between 1982 and 1989 to 2.9% between 1990 and 1997(GOK, 1998b). Food processing is by far the largest component of manufacturing both in output and value adding (GOK, 1998a). The food- manufacturing sub-sector is therefore of crucial importance to the overall economy.

The food manufacturing industry is a key sub-sector in any country's economy and more so in the Kenyan context, which is to a large extent agro based. Food manufacturing was started during the colonial era in Kenya to satisfy the supply of consumer goods made mainly from primary products produced in East Africa. Before the second world war a few industries processing primary products for sale had been established however by 1961 the food import bill was rated as being very high and therefore food processing became an area of import substitution industrialisation strategy (Coughlin and Ikiara, 1998). Earlier studies by Aosa (1992), found that food-manufacturing output accounts for a large component of the total manufacturing industry in Kenya. Firms in the sector specialise in the manufacture of a wide range of food products ranging from cigarettes, beverages, sweets, fruits, vegetables, cereals e.t.c and have to compete with both local and international players.

This industry has recently been facing an increasing number of challenges due to liberalisation of trade and licensing procedures, diminishing purchasing power of consumers, globalisation e.t.c. The net effect has been an increase in competition due to new entrants in the industry as evidenced by entry of companies like Kapa and Bidco in the cooking oil segments previously dominated by Unilever. Other segments like drinking juice and sausages have seen an increased number of new entrants. The increased number of players in the industry sector, ability to

import cheap inputs, competition from imported goods, coupled with a diminished customer purchasing power has meant that firms have had to look at various strategies of surviving in the sector (Chune, 1998). A cursory look at food manufacturing firms in Nairobi indicates that various firms are undertaking different scope of activities in their product value chains and hence depict varying levels of vertical integration. However what is not exactly clear is the relationship if any between the degree of vertical integration and performance of these firms and whether it conforms to studies done elsewhere.

1.3 RESEARCH PROBLEM

Chune (1998) observed that changes in the internal behaviour of food manufacturing companies have occurred due to changes in the external environment. Chune (1998) specifically recommends that studies should be done to determine the impact of various strategies adopted by food manufacturing firms on a firms' performance as reflected by the profits. Vertical integration is among the strategies that have been adopted in the industry as evidenced by East African Breweries Limited vertically integrated backwards into carbon dioxide production thereby avoiding dependence on Carbacid Investments Limited for the manufacture of an important input for both beer and bottles (Njau, 2000). However there is scarcity of studies documenting the relationship between vertical integration strategy and the performance of a firm in the industry locally. Elsewhere Harrigan (1986) has identified a connection between vertical integration and profit at the single business unit level. On the other hand Rumelt (1974,1982) in (D'Aveni and Ravenscraft, 1994) found vertically integrated firms to be the poorest performers of all the diversification types in his multi-industry study of corporate strategy. D'Aveni and Ilinitch (1992) also found that vertically integrated firms had a higher risk of bankruptcy than non-integrated firms. Deriving from transaction-cost theory, it may be assumed that the degree of vertical integration would be positively related to the performance of firms in the food-manufacturing firms in Nairobi. But is this really the case? Is there any relationship between the degree of vertical integration and performance in food

manufacturing firms in Nairobi or not? Should managers and investors in the food-manufacturing sub-sector in Nairobi consider vertical integration as one of the strategies to adopt in order to improve performance?

1.4 RESEARCH OBJECTIVES

The objective of the study was to establish the relationship between vertical integration and performance of food manufacturing firms in Nairobi.

1.5 IMPORTANCE OF THE RESEARCH

The findings of the study are expected to be useful to:

- (i) Senior managers in the food industry in the choice of corporate and competitive strategies.
- (ii) Practitioners and scholars in strategic management as a source of reference material.

2.2 BASIS OF VERTICAL INTEGRATION

The transaction cost theory is a well-known explanation of vertical integration which seeks to determine when a transaction should be carried out either by a single firm or by two or more separate firms transacting in the market. (Coase, 1937; Alchian, 1965) Transaction costs which are distinct from production costs, manufacturing costs or sales costs include all expenses and time incurred in the process of bargaining and contracting as well as expenses incurred in the process of monitoring and enforcing the terms of the contract. The theory is based on the normal course of conducting business in a rapidly

2 LITERATURE REVIEW

This chapter covers the literature review vertical integration and performance under the following topics vertical integration, bases of vertical integration, degree of vertical integration, pitfalls of vertical integration, measures of performance, relationship between vertical integration and performance and summary.

2.1 VERTICAL INTEGRATION

Value is the amount that a buyer is willing to pay for a service or product provided to him by a firm. Porter (1998) states that a firm's value chain displays total value and consists of value activities and margin. Porter (1998) further argues that a firm's value chain is embedded in a larger stream of activities, the value system. The extent to which these value activities (transactions) are carried within a firm define the degree of a firm's vertical integration and hence its structure and boundaries (Grossman and Helpman, 2002). According to Martin (1986) vertical integration may depend on the costs over markets, it may be a strategy for exercise, reinforcement or creation of market power and may lead to lower costs and higher profits.

2.2 BASES OF VERTICAL INTEGRATION

The transaction-cost theory is most cited explanation of vertical integration seeks to determine when a transaction should be carried out within a single firm (monitoring) rather than by two separate firms transacting in the market?" (Coase, 1937; Winger, 1994) Transaction costs which are distinct from production costs, manufacturing costs or sales costs include all expenses and foregone opportunities that arise because of actual bargaining and dickering as well as expenses borne to avoid potential disagreements inevitably arise as firms bargain and disagree in the normal course of conducting business in a rapidly

changing marketplace, while monitoring costs are associated with controlling a process when it is done in-house (Regan, 1997). According to Williamson (1975, 1986), Klein et al (1978), Frank and Henderson (1992) the incentives for vertical integration result from problems of small numbers bargaining either due to small numbers of firms in the market or/and sunk investments which lock-in between buyers and sellers.

The most important determinant of transaction costs is the so-called degree of asset specificity: the extent to which the transacting firms invest in assets whose value depends on the business relationship's remaining intact (Berlin, 2001). A firm at one stage may be able to appropriate quasi-rents from another firm with idiosyncratic investments (Klein et al, 1978). If allowances for future contingencies can be adequately specified long-term contracts can be written to avoid hold-up problems, otherwise firms increasingly will use vertical integration order to prevent opportunistic behaviour (Klein et al, 1978; Frank and Henderson, 1992; Regan, 1997; Pisano, 1990).

Transaction costs also tend to increase when information is a big component of the item being exchanged. Generally information may flow more easily within an organization than between organizations and firms often have specialized internal mechanisms for handling more serious disputes between different departments (processes) that constitute a product value chain (Berlin, 2001; D'Aveni and Ravenscraft, 1994; Winger, 1994). Christensen (2001) states that, "when necessary and sufficient information doesn't exist at critical market interfaces, integration is imperative".

The transaction-cost theory posits that the costs of market (contractual) governance increase when the terms of exchange are surrounded by uncertainty. Uncertainty over the terms of trade arises when the contingencies affecting the execution of the agreement are complex and difficult for the trading partners to understand, predict, or articulate. Strategic uncertainty may be created by strategic misrepresentation, nondisclosure, disguise or distortion of information, complexity of information leading to uncertainty for firms in their relations with

suppliers, customers, and competitors (Williamson, 1989; Winger, 1994). The greater uncertainty the greater vertical integration expected all other factors remaining constant (Krickx, 2000; Pisano, 1990). Firms will therefore seek to determine an optimal organizational form i.e. the degree of vertical integration that results in the lowest sum of both transactions and monitoring costs (Regan, 1997; Klein and Murphy, 1997).

A second basis for vertical integration stems from property rights approach. According to the property rights view of an organization the bargaining power and the assets that confer bargaining power should be in the hands of those people whose efforts are most significant in increasing the value of the business relationship. Giving these people more bargaining power ensures that they receive more of the rewards from investing time and energy and thus have a stronger incentive to make these investments (Berlin, 2001). A manufacturing firm whose real value is in its ability to innovate should therefore integrate forward and own its distributor so as to confer bargaining power to the engineers who contribute most to the firm's value.

The multi-task approach is yet another perspective which has been used to explain vertical integration. According to this approach, complex and difficult-to-measure tasks should be handled by employees, with subjective evaluations supplementing otherwise low-powered incentive schemes as opposed to less complex easy -to-measure tasks which should given to third parties with high-powered incentive schemes (Berlin, 2001). Firms therefore may integrate vertically on the basis of the complexity of the tasks and technology involved in the total product value chain (Christensen, 2001).

A more recent approach of explaining vertical integration is through a Relational contracts approach. Relational contracts which may be seen as self-enforcing informal agreements and unwritten codes of conduct that affect the behaviours of individuals within firms and between firms are major factor in decisions as

whether integration or non-integration. Since these relational contracts are outside third party like courts the value of the future relationship must be sufficiently large that neither party wishes to renege (Baker et al, 2002; Klein and Murphy, 1997). Corporate managers may use vertical integration to harmonize incentives, replacing profit maximization at individual stages with joint profit maximization (D'Aveni and Ravenscraft, 1994; Berlin, 2001). According to Klein and Murphy (1997) vertical integration may increase flexibility by reducing the degree of contractual specification under uncertain circumstances because these arrangements are more likely to assure the ex post distribution of rents between transactors relative to their gains from non-performance.

According to Charlton (1979), Porter (1982), Frank and Henderson (1992), Thompson (1967), D'Aveni and Ravenscraft (1994) under certain conditions downstream firms will integrate backward to satisfy the "higher" probability demand and use the market input to satisfy the lower probability demand, hence avoid paying premium for inputs caused by fluctuating inputs demand induced by other buyers and market imperfections. Additionally the utilization of both in house and market supply may guard against sub-optimisation in the production of in-house inputs. Similarly, a high degree of forward vertical integration through internal transfers can reduce costs by guaranteeing adequate outlets for a firm's outputs, reducing price distortions caused by powerful dealers or distributors, and providing access to information about upstream profits and manufacturing processes (Pennings et al, 1984). Forward integration eliminates the need to incur advertising and other selling expenses between two stages. It provides the firm with information about consumer needs, and it provides a credible threat that reduces buyers' bargaining power (Porter, 1980; D'Aveni and Ravenscraft, 1994). The price discrimination motive may also motivate a firm to integrate as means of exerting power and control. An intermediate monopolist supplier may integrate with the downward firm with the more elastic demand for the input while raising the price of input for the more inelastic downstream firms (Grossman and Helpman, 2002; Perry, 1980).

Vertical foreclosure where one of the manufacturers integrates with the monopolist supplier to gain a competitive advantage in the market for the final good may yet be another motive for vertical integration (Berlin, 2001; Avenel and Barlet, 2000). However according to Avenel and Barlet (2000) it is only the integrated firm that adopts a non-standard technology that completely forecloses its rivals. In other words complete foreclosure is a consequence of a technological choice and may also be used also be used to protect proprietary technology (Jones and Hill, 1988), thus resulting in a competitive advantage.

Synergies or economies of scope where there are savings from production of several related or complementarily items by a single firm as compared with their production by several specialized firms may yet be another motive for vertical integration as seen for example in petroleum and natural gas if both come from the same well (Baumol, 1997). Production technology under integration may lower costs through shared facilities and overlapping R&D efforts, thus reducing production costs and R&D expenditures to sales (D'Aveni and Ravenscraft, 1994).

2.3 DEGREE OF VERTICAL INTEGRATION

The most common quantitative measure of the degree of vertical integration is the ratio of the value added to the sales (Stephen, 1986). Value added as fraction of sales measures the portion of a firm's sales that are generated by activities within a firm's boundaries. A firm depicting a high ratio **VA/S** has brought many of the value creating within its boundaries which is consistent with a high degree of vertical integration and vice versa (Barney, 1997). Maddigan (1979) further proposes that sum of net income and income tax be subtracted from both value added and the sales in order to control for inflation and changes in tax code over time.

2.4 PITFALLS OF VERTICAL INTEGRATION

Vertical integration may however decrease the performance of a firm through increased bureaucratic costs associated with the running and coordinating of increased activities. Mobility and exit barriers may increase strategic inflexibilities trapping firms into keeping obsolete technologies and strategies due vested interests in protecting its huge technological and production investment resulting in slower adoption of new technologies than partially integrated firms (D'Aveni and Ravenscraft, 1994). Vertical integration may also create complex problems of control and coordination resulting in managerial inefficiencies especially when general management does not have the skill and competence to manage the acquired firms due to the different key success factors and competencies required.

Under-utilized capacity may increase costs in some stages of production if throughput is unbalanced and if technological factors force firms to build plants of differing scales at adjacent stages of production. The firm may also have to work out the means of handling and disposing any by-products that may be generated by the additional activities. Capacity balancing issues may mean that the firm may need to build excess upstream capacity to ensure that its downstream operations have sufficient supply under all demand conditions thus increasing the firm's business risk in the event of poor performance of the particular industry.

Vertical integration may also lock a firm in in-house production, which may result in higher than open market unit cost, and less flexibility in the accommodation of customers varied needs in terms of quantities and differentiation due to lack of competition. Finally vertical integration may lead to a distortions in the behaviour of agents of the downstream trading partner since an agent in a more integrated firm does not have the same profit maximizing incentives that an autonomous agent as he is unlikely to fully capture the gains from his efforts (Regan, 1997).

2.5 MEASURES OF PERFORMANCE

According to Barney, 1997 there are numerous definitions of organizational performance but little agreement on the superiority of one to the others or even on the criteria against which they should be judged. Barney (1997) develops a conceptual definition of organizational performance that is based on the comparison between the value that an organization creates using its productive assets with the value that the owners of the assets expect to obtain. When the value created by the firm is higher than the expected value by the asset owners then the performance is seen as above normal and vice versa. Parity between the actual and expected value is considered as being a normal performance. This definition although theoretically sound from a microeconomics, organizational theory and organizational behaviour perspective, and though useful in analysing the impact of a firm's external environment on its internal environment presents difficulties in measurement. Deriving from the above definition above there are a variety of techniques for measuring none of which is without limitations and it is advisable to apply multiple measure of performance when conducting a firms strategic analysis. Barney (1997) suggests four a major approaches as follows: (1) Survival as a measure of performance (2) Accounting measures (3) Stakeholders approaches and (4) Present value approaches. From a manufacturing point of view, performance may be approached from productivity or utilisation point standpoint.

White (1996) states that performance measurement serves not only as a scorecard, but also as a compass that can indicate directions for needed improvement in a company's activities. Historically performance measures have mainly taken the form of accounting although these suffer from among others subjectivity to managers, short-term biasness, backward looking, undervalue a firm's intangible resources and capabilities and provide little insight into a company s future performance offer (Barney, 1997; Maines et al, 2002). There is evidence that non-financial performance may predict future financial variables

and that analysts and other market participants use non-financial measures to value stocks measures subject to firm specific, industry, environmental, and regulatory factors. (Maines et al, 2002; Kaplan and Norton 1992; White, 1996) However their lack of a theoretical prediction reduces confidence in attributing observed relations to the specific non-financial performance measures, the non-comparability among types and formats are likely to hamper investors ability to use non-financial measures, hence the focus is primarily on financial measures for assessing performance (Maines, et al, 2002; White, 1996)

The balanced scorecard (Kaplan and Norton, 1992) seeks to balance financial measures that give the results of actions already taken and operational measures on customer satisfaction, internal processes, and the organization's innovation and improvement activities that are the drivers of future financial performance. Financial performance measures indicate whether the company's strategy, implementation and execution are contributing to bottom-line improvement. Typical financial goals have to do with profitability, growth, and shareholder value and are shareholder driven (Kaplan and Norton, 1992).

Innovation and learning perspective, which measures a company's ability to innovate, improve, and learn ties directly to the company's value. The ability to launch new products creates more value for customers and improves operating efficiencies continually thereby increasing shareholder value (Kaplan and Norton, 1992). The internal measures seek to identify and measure their company's core competencies, the critical technologies that the company must excel in to ensure continued market leadership (Kaplan and Norton, 1992). Customer Perspective looks at what the customers value and how best to deliver them in terms of time, quality, performance and service, and cost (Kaplan and Norton, 1992).

However in situations where comparisons between the performance of several firms has to be undertaken the only objective method of doing so involves the use of accounting methods such as profitability ratios e.t.c

2.6 RELATIONSHIP BETWEEN VERTICAL INTEGRATION AND PERFORMANCE

According to Coase (1937) a high degree of internal transfers can confer economies of integration by reducing transaction costs, including the costs of finding, selling, negotiating, contracting, monitoring, and resolving disputes with other firms in open market transactions (Coase, 1937). Growing theoretical literature in strategy and industrial organization economics indicates that there is substantial incentive for firms to vertically integrate to among others avoid market costs, eliminate the distortion in input costs caused by imperfect competition in the upstream market, reduce transaction costs, and protect proprietary technology, create barriers to entry, enable price discrimination, reduce service and advertising externalities and provide a firm with power over buyers or suppliers (D'Aveni and Ravenscraft, 1994), thus resulting in superior performance compared to the less integrated. Despite the strong theoretical predictions of a relationship between degree of vertical integration and performance in a specific industry past empirical works have not been in total agreement on nature and extent of relationship if any. Harrigan (1986) has identified a vertical integration and profit connection at the single-business-unit (SBU) level and D'Aveni and Ravenscraft (1994) in their study of American industries has established that the benefits of vertical integration slightly outweighing its costs. On the other hand Rumelt (1974, 1982) in (D'Aveni and Ravenscraft, 1994) found vertically integrated firms to be the poorest performers of all the diversification types in his multi-industry study of corporate strategy. In a single-industry study of forest product firms, D'Aveni and Ilinitch (1992) found that vertically integrated firms had a higher risk of bankruptcy than non-integrated firms.

2.7 SUMMARY

Given the limited empirical studies and the disparity in conclusions and results found by different authors more studies are necessary to establish the relationship between vertical integration and performance both locally and abroad to confirm theoretical predictions of vertical integration strategies. Food manufacturing firms in Nairobi displays varying scope of activities and it would be important to establish the merit of vertically integrating from a performance point of view given the operating environment. This study predicts that there is a positive correlation between a firm's degree of vertical integration and its profitability performance for the food manufacturing firms in the Nairobi area. Firms in the industry that carry out a higher proportion of value adding activities of the final product value within them are likely to have a better profitability performance as compared to those that carry out a lower proportion of value adding activities as indicated by the degree of vertical integration.

3 RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

The type of research undertaken was an exploratory-sectional survey carried out at a single point in time. A similar research design was adopted by (Chune, 1998) on his study of business environment on food manufacturing firms in Nairobi.

3.2 POPULATION

The population consisted of all food-manufacturing firms in the Nairobi and its environs as registered by the Kenya Industrial Research and Development Institute in the year 1997 and Kenya Association of manufacturers directory 2002 edition according to the International Statistical Industry Code 31. Local experience has shown that some local firm are unable to prepare financial reports for an operating year for up to two years for varying reasons, the year 2000 was therefore used to ensure that the required financial data would be available from all the firms understudy. A census survey of all the firms was attempted. A census survey was justified by the small number of firms in the population under study, which totalled a hundred and one.

3.3 DATA COLLECTION METHOD

Secondary data, consisting of financial measures for the year 2000 was obtained from the firms' Balance Sheets and Profit and Loss Accounts using a structured questionnaire (see appendix A). Data from the listed firms was obtained directly from their financial reports at Nairobi Stock Exchange. On the other hand data from non-listed companies who were willing to participate in the study was obtained from senior financial officers through mail and personal visits by the researcher.

3.4 DATA ANALYSIS

The data was analysed using both correlation analysis and descriptive statistics.

Descriptive statistics

Descriptive statistics were used to establish the mean, range and standard deviations of the both the independent, the degree of vertical integration (VI) and dependent variables i.e. return on assets (ROA), return on equity (ROE), net profit margin (NPM).

Correlation and regression analysis

Correlation and regression analysis were used to establish the relationships between the degree of vertical integration (VI), the independent variable and various performance measures, the dependant variables. The performance measures used in the study were as follows return on assets (ROA), return on equity (ROE), net profit margin (NPM).

Each of the above performance measures was regressed on the degree of vertical integration to establish the relationship according to the equation below.

$$Y = a + b X$$

Where Y represented the dependent performance variable and X represented the independent variable the degree of vertical integration.

Degree of vertical integration (VI) for a firm was calculated as proposed by (Maddigan, 1979) in the model shown below.

$$\text{Degree of vertical integration} = \frac{\text{Value added} - (\text{net income} + \text{income taxes})}{\text{Sales} - (\text{net income} + \text{income taxes})}$$

Value added = depreciation + amortization + fixed charges + interest expenses +
+ Labour and related expenses + Pension and retirement
expenses + income taxes + net income (after taxes) + rental
expenses (Tucker and Wilder, 1978)

The various profitability performance measures were calculated as shown below.

$$\text{Return on assets (ROA)} = \frac{\text{Profit after taxes}}{\text{Total utilised assets}}$$

$$\text{Return on equity (ROE)} = \frac{\text{Profit after taxes}}{\text{Total stockholders equity}}$$

$$\text{Net profit margin (NPM)} = \frac{\text{Profit after taxes}}{\text{Sales}}$$

Data from the questionnaire was used to calculate both the degree of vertical integration (VI) and the profitability performance measures ROA, ROE and NPM using excel worksheet. The resulting variables were analysed using the statistical package SPSS 10 for windows to generate both the descriptive statistics and regression equations between the degree of vertical integration and the individual performance measures.

The resulting coefficient of correlation (R) gave an indication of the strength and the direction of the relationship between the independent variable (VI) degree of vertical integration and the dependent variables i.e. ROA, ROE and NPM. On the other hand the coefficient of determination (R square) gave an indication of the extent to which changes in the dependent profitability variables ROA, ROE and NPM were attributed to a change in the independent variable the degree of vertical integration (VI).

4 DATA ANALYSIS AND RESEARCH FINDINGS

4.1 INTRODUCTION.

Data analysis and research findings are presented here under the following topics descriptive statistics, relationship between vertical integration and performance

Data was obtained from a total of seven firms out of which five were listed on the Nairobi Stock Exchange and the other two were non-listed. The rest of the firms declined to participate in the study citing the sensitivity and confidentiality of the data requested. The completed questionnaires were checked for completeness. The data was inputted into an excel work sheet that was used to calculate relevant variables: degree of vertical integration (VI), Return on Assets (ROA), Return on equity (ROE) and Net Profit Margin (NPM). The resulting variables for each company were then analysed using SSPSS 10 for windows statistical programme first to generate descriptive statistics of the data. Secondly three regression equations were established between the degree of vertical integration (VI) as the independent variable and each of the profitability performance measures Return on Assets (ROA), Return on equity (ROE) and Net Profit Margin (NPM) to establish the nature and strength of correlation.

4.2 DESCRIPTIVE STATISTICS

The research sought to establish the relationship between vertical integration and performance of food manufacturing firms in Nairobi. In order to investigate the relationship, we first obtained a measure of degree of vertical integration (VI) and profitability performance measures; return on assets (ROA), return on equity (ROE) and net profit margin (NPM) for each firm using data collected by the questionnaire (see Appendix A) as shown in the table below.

Table 1. Summary of Descriptive analysis of Variables

	N	Mean	Std. Deviation
VI	7	0.3343	0.1939
ROA	7	0.01286	0.1023
ROE	7	0.1043	0.2830
NPM	7	-0.00143	0.0919

As the table shows the degree of vertical integration from the sample varied from a minimum of 0.07 to a maximum 0.64 with a mean of 0.33 and a standard deviation of 0.1939. The value of the return on assets varied from a minimum of -0.13 to a maximum of 0.16 with a mean of 0.013. The return on equity varies from a minimum of -0.39 to a maximum 0.48 with a mean of 0.10. Finally the net profit of the sample firms ranges from a minimum of -0.12 to a maximum of 0.14 and a mean approximately 0.

4.3 RELATIONSHIP BETWEEN VERTICAL INTEGRATION AND PERFORMANCE

The objective of the study was to establish the relationship between vertical integration and performance of food manufacturing firms in Nairobi. Three regression runs were made to establish the nature and strength of relationship between degree of vertical integration (VI) and the individual profitability ratios; ROA, ROE and NPM and results obtained as shown in sections 4.3.1 below.

Table 2. Summary of regression models of ROA on VI, ROE on VI and NPM on VI

Model	R	R Square	Std. Error of the Estimate
ROA	0.575	0.331	0.09164
ROE	0.63	0.397	0.2408
NPM	0.492	0.242	0.08764

Predictors:(Constant), VI

Table 3. Summary of coefficients of regression models of ROA on VI, ROE on VI and NPM on VI

Dependent Variable	Model	B Coefficient	Std. Error of Coefficient	t
ROA	(Constant)	-.0085	.073	-1.209
	VI	0.303	0.193	1.572
ROE	(Constant)	-0.203	0.192	-1.055
	VI	0.919	0.507	1.813
NPM	(Constant)	-0.094	.070	-1.135
	VI	0.233	0.185	1.265

4.3.1 Regression of Return on Assets (ROA) on Degree of Vertical Integration (VI)

From the tables 2 and 3 above the regression model of return on assets (ROA) on degree of vertical integration (VI) resulted correlation coefficient (R) value of 0.575 indicating that there was a moderate positive association between VI and ROA. The coefficient of determination (R square) has a value of 0.331, thus indicating that only 33.1% of the changes in the return on assets (ROA) could be attributed to the change in degree of vertical integration (VI). The standard error of estimate for the relationship was approximately 0.09.

4.3.2 Regression of Return on Equity (ROE) on Degree of Vertical Integration (VI)

From the tables 2 and 3 above the regression model of return on equity (ROE) on degree of vertical integration (VI) resulted correlation coefficient (R) value of 0.630 indicating that there was a moderate positive association between VI and ROE. The coefficient of determination (R square) has a value of 0.397, thus indicating that only 39.7% of the changes in the return on assets (ROE) could be

attributed to the change in degree of vertical integration (VI). The standard error of estimate for the relationship was approximately 0.241.

4.3.3 Regression of Net Profit Margin (NPM) on Degree of Vertical Integration (VI)

From the tables 2 and 3 above From the tables 2 and 3 above the regression model of net profit margin (NPM) on degree of vertical integration (VI) resulted correlation coefficient (R) value of 0.492 indicating that there was a moderate positive association between VI and NPM. The coefficient of determination (R square) has a value of 0.242, thus indicating that only 24.2% of the changes in the net profit margin (NPM) could be attributed to the change in degree of vertical integration (VI). The standard error of estimate for the relationship was approximately 0.088.

5.2. DISCUSSION AND CONCLUSIONS

The study looked at the degree of vertical integration as defined by Blodgett (1976) and its relationship to several profitability performance measures namely return on assets (ROA), return on equity (ROE) and net profit margin (NPM). The findings revealed that the degree of vertical integration had a positive relationship with the profitability measures. The study also revealed that the degree of vertical integration had a positive relationship with the degree of vertical integration. The study also revealed that the degree of vertical integration had a positive relationship with the degree of vertical integration.

5 SUMMARY, DISCUSSIONS AND CONCLUSIONS

5.1 SUMMARY

The research study sought to establish the relationship between vertical integration and performance of food manufacturing firms in Nairobi. Different firms were found to display various degrees of vertical integration ranging from a minimum of 0.07 to a maximum 0.64, associated with these were varying values of the various performance measures ranging from a minimum of -0.13 to a maximum 0.16 for return on assets, a minimum of -0.39 to maximum of 0.48 for return on equity and a minimum of -0.12 to a maximum of 0.14 for net profit margin.

The regression analysis between the degree of vertical integration (VI) and the profitability performance measures; return on assets (ROA), return on equity (ROE), net profit margin (NPM) yielded correlation coefficients (R) that ranged from 0.492 to 0.630 indicating a moderate association between the independent and dependent variables and a coefficient of determination (R square) ranging from 0.242 to 0.339, indicating that between 24.2% and 33.9% of the change in the dependent variables profitability performance measures were attributed to changes in the independent variable the degree of vertical integration. The results therefore indicated that the performance of food manufacturing firms in Nairobi area is moderately and positively related to the degree to which the firms are vertically integrated.

5.2 DISCUSSIONS AND CONCLUSIONS

The study looked at the degree of vertical integration as defined by Maddigan (1979) and its relationship to several profitability performance measures namely return on assets (ROA), return on equity (ROE) and net profit margin (NPM) among food manufacturing firms in Nairobi area. The findings confirmed that firms in the industry had varying degrees of vertical integration reflecting the

different extents of value adding activities as a fraction of the final product cost. The findings showed that there was a moderate positive association between the degree of vertical integration and performance as shown by profitability in the food manufacturing industry in Nairobi. The results also show that that a change in the degree of vertical integration accounted for between 24.4% to 39.7% of the resultant change in the profitability performance of the firms as indicated by the ratios return on assets (ROA), return on equity (ROE) and Net profit margin (NPM). The results therefore show that there was a positive correlation between the degree of vertical integration and the profitability performance of firms in the food manufacturing industry in Nairobi area in the year 2000.

There results seem to suggest that the food manufacturing firms that are more vertically integrated i.e those that carry out a higher proportion of the value adding activities to the final are likely to out perform those that carry out a smaller proportion of the same leading to better profitability performance in the more vertically integrated food manufacturing firms in Nairobi. Current managers and prospective investors in the food manufacturing industry in Nairobi therefore need to consider vertical integration among the possible strategies that they may opt to implement to improve the profitability of their firms, however the optimal degree to be adopted by each firm must be based on careful analysis of the expected profit gains due to decreased transaction costs against the possible costs of increased bureaucracy and efficiencies costs.

5.3 LIMITATIONS OF THE STUDY

The study did not take into consideration other factors that may have affected the performance of the firms during the year of study. The sample size used for the study was also small due to the reluctance of most firms to participate in the study citing data sensitivity and confidentiality. A larger sample size would have probably yielded more generalized results. The study was limited to one year i.e. the year 2000.

5.4 SUGGESTIONS FOR FURTHER RESEARCH

Similar studies should be undertaken in other industries in the Nairobi area in the year 2000 to determine if there is a similar correlation between the degree of vertical integration and the performance in other industries. Alternatively similar studies should be undertaken in food industries in the agriculturally intensive areas like Eldoret and Kitale to establish the prevailing relationship. Further studies should take into consideration other explanatory factors such as firm structure, size, age, levels and quality of personnel, the technology utilised, financing e.t.c that are known to impact on the performance of firms.

5.5 IMPLICATIONS FOR POLICY AND PRACTICE

The findings imply that Nairobi area food manufacturing firm policy makers should create and adopt policies that take cognise of and that facilitate vertical integration as a possible strategy. The policies should seek to explore ways and means to increase their scope of value adding activities as this is likely to result in improved performance, managers should therefore seek possible ways of increasing vertical integration through participation in a wider range of value adding activities to their products. However the optimal degree to be adopted by each firm must be based on careful analysis of the expected profit gains due to decreased transaction costs against the possible costs of increased bureaucracy and inefficiencies.

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7 APPENDICES

APPENDIX A- QUESTIONNAIRE

QUESTIONNAIRE FOR VERTICAL INTEGRATION AND PERFORMANCE OF FOOD MANUFACTURING FIRMS IN NAIROBI

This questionnaire has been compiled by Donald Mahaga for the Master of Business Administration (MBA) programme, Faculty of Commerce, University of Nairobi. Please complete it as accurately as possible.

If there are any issues that need clarification kindly get in touch with him on 0722 303488

- A1. Total sales year 2000 (Million Ksh.).....
- A2. Total operating income year 2000 (Million Ksh.).....
- A3. Income taxes year 2000 (Million Ksh.).....
- A4. Nett Depreciation year 2000 (Million Ksh.).....
- A5. Armortization year 2000 (Million Ksh.).....
- A6. Fixed charges year 2000 (Million Ksh.).....
- A7. Interest expense year 2000 (Million Ksh.).....
- A8. Labour and related expenses year 2000 (Million Ksh.).....
- A9. Pension and retirement expenses year 2000 (Million Ksh.).....
- A10. Net income after taxes year 2000 (Million Ksh.).....
- A11. Rental expense year 2000 (Million Ksh.).....
- A12. Average Assets Employed year 2000 (Million Ksh.).....
- A13. Total Shareholders Equity year 2000 (Million Ksh.).....