

## Effect of Vertical Integration on the Performance of Agricultural Commodity Business. Case Study of Export Trading Company Ltd

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### ARTICLE INFO

#### Article history:

Received: 20 April 2016;

Received in revised form:  
22 May 2016;

Accepted: 27 May 2016;

#### Keywords

Warehousing,  
Transportation,  
Distribution,  
Supply Chain ,  
Value Chain vertical  
integration,  
Supplier  
relationshipmanagement,  
Transaction Cost economics,  
Just in time,  
Collaborative planning,  
Forecasting and replenishment.

### ABSTRACT

Vertical Integration remains a critical concept for organizational that seeks to own activities along the supply chain with an aim of gaining control of activities within their line of business. In most organizations vertical integration as a strategy once adopted along the supply chain, seeks to have an effect on value addition, cost reduction and control of the activities the organization has owned through vertical integration. The general objective of the project was to identify and evaluate the effects of vertical integration on the performance of agricultural commodity business. The theoretical review established the effects of vertical integration towards the performance of agricultural commodity business. The specific objectives of the study discussed the effects of ownership of warehouses; transport ownership, supplier relationship management and distribution ownership on the performance of agricultural commodity business in Export Trading Co Ltd. The study was conducted through a descriptive design to describe the effects of vertical integration on the performance of the agricultural commodity business. Stratified sampling technique ensured success of coming up with a sample size of 45 respondents from the target population of 148. Primary and secondary data was collected for the research, a semi structured questionnaires was used to collect primary data while press releases, journals, company website will provide secondary data. The primary data will be analyzed through Statistical Program of Social Studies SPSS (Version 20). The study conclusion gave percentage variations of warehousing, transport, distribution and food processing on the performance of agricultural commodity business. This provided a strong practical value from the results to assist future parties of interest within the subject of vertical integration with proper understanding of the subject.

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### 1. Introduction

Vertical integration is not a new phenomenon in organizations specifically with the organizations dealing in agricultural commodity business and aligning their supply chain for a competitive advantage. Christopher (2011) asserts that vertical integration normally implies ownership of upstream suppliers and downstream customers of the organization particularly with a vertical integrated supply chain. Stuckey & White, (2011) concurs that vertical integration vertical integration is a strategy that many companies use to gain control over their industry's value chain. This strategy is one of the major considerations when developing corporate level strategy. The important question in corporate strategy is, whether the company should participate in one activity or many activities along the industry value chain. In agriculture, it has been widely argued that recently, agriculture is undergoing a process of vertical integration with allied industries and that consequently the control of agriculture in the future may of rest within industry itself (Trifon, 2006).

Harrigan (2009) states that vertical integration should be considered from two points: internal benefits and costs, and effects on competitive postures. Internal benefits affect the profitability as the strategy while strength in competitive posture enable firms to be more responsive to changes in market needs and less vulnerable to the maneuvers of

competitors. McBain (2007) defines Agri-business as all market and private business oriented entities involved in production, storage, distribution and processing of agro-based products; in the supply of productions inputs and in the provision of services, such as extension and research. Feenestra (2006) discusses that the rising vertical integration of world markets has brought with it disintegration of production process in which manufacturing or services activities done abroad are combined with those performed at home. A feature of this integration is trade associated with fragmentation of production across national borders (Jones & Kierzkowski, 2007). Antras (2008) contends that complex vertical integrated firms operate in host countries in order to serve the domestic or home country more cheaply produce and sell in local host country markets to save on trade costs or produce for third country markets. Badnger & Egger (2008) asserts that in agricultural commodity trading, vertical integration is very important to facilitate competitiveness of the organization through sourcing from markets of high supply and more products to other countries of low supply having a high demand. Vertical Integration ensures that the firm is able to add value in the supply chain. When procuring the produce that are in demand in other organization by ensuring value additional processes the example of agricultural commodity business where procured products are also processed into final consumable items.

### **1.1 Vertical Integration in Agricultural Commodity Business in Kenya**

Kenya has had a successful sector development since the early 50's. In the early 90's, the Agro-processing sector contributed about 10 percent to GDP and 34 percent total employment. During this period however, the government introduced far reaching structural reforms including removal of process controls, removal of all import licensing and removal of foreign exchange control. These measures slowed growth substantially to 1.2 percent in 1997, (Jeffee 2002)

The agricultural management, marketing and finance Sessional paper 6 of Government of Kenya on the topic "strengthening farm Agri-business linkages in Kenya" farm agri-business linkages in dairy cereals, traditional cash crops and horticulture have in the past been influenced by government policies towards agriculture. These policies include the general as well as the more sub-sector specific interest to the government often through commodity specific marketing agencies.

### **1.2 Statement of the Problem**

Vertical Integration as a strategy, once adopted seeks to gain control over the organization supply chains. The supply chain strategy enables an organization to gain control over forward and backward suppliers within the organization to achieve the goal of ensuring a sustainable supply chain. One of the major challenges in organizations is whether or not to vertically integrate, based on the implications of economic outcomes or realized transaction costs. This leads to questions about when integration has first-order incentive effects in case of franchising or effects on decision-making or adaptation in the case of sourcing different innovation and productive efficiency. Quantifying the effects of integration decisions poses some challenges particularly the difficulty challenge of the econometric problem of selection, where a firm chooses to integrate when they think it will lead to productivity benefits, finding the right variation to identify the effect of integration on productive efficiency is going to be difficult (Bresnahan & Levin, 2012).

Vertical Integration may have both a large efficiency benefit and a large efficiency cost, but this is not guaranteed. This suggests that a more promising strategy may be to look at decisions that are complementary to integration. Holmstrom & Milgrom, (2012) counsels that small variations in the environment might lead firms to make large changes to a cluster of policies if there are important complementarities. These difficulties notwithstanding, there is a variety of evidence that sheds some light on differences across integrated and non-integrated firms. Enghin et al, (2012) discusses that integration, plant size; capital intensity and labor productivity are positively correlated. They further include a striking finding about commonly owned plants in vertically related industries. There is relatively little transfer of physical goods from one plant to another. Instead, plants within the same firm in vertically related industries are overwhelmingly involved in "merchant" operations in which they transact across the firm's boundary.

Vertical Integration is a difficult strategy for companies to implement successfully and it is often expensive and hard to reverse. Upstream producers frequently integrate with downstream distributors to secure a market for their output. This seems okay when times are good but many firms have found themselves cutting prices sharply to their downstream distributors when demand has fallen just so they can maintain targeted levels of plant utilization. Export Trading Co Ltd

through ownership of the warehouses, distribution network, and transportation and supplier relationship management remains a critical topic to ascertain the benefits of the strategy to the organization. They include value chain benefits; cost and productivity to the organization as outlined by organization core strategy for achievement instead of outsourced strategy through a Make-Or Buy strategy (Lysons & Farrington, 2012).

## **2. Literature Review**

### **2.1 Transaction Cost Theory (Williamson, 2010)**

This theory expands on Robert Coase's original idea by describing a wide set of transaction inefficiencies and potential organizational responses. A starting observation is that market contracts are inherently incomplete. Parties can plan for some contingencies, but not every contingency. This means that in a great many transactions there will be room for opportunistic and inefficient behavior as the transaction proceeds. The concern may be especially severe when complexity or uncertainties make it difficult to specify contractual safeguards, or when parties cannot walk away without incurring substantial costs. Transaction cost theory argues that integration can be an effective response when these features are present.

One reason given by Williamson (2010) relates to decision-making. When a dispute arises as a result of conflicting decisions within an organization, it can be settled by a senior manager. In contrast, a dispute between separate entities must be resolved by negotiation or litigation from the managerial authority to make it easier to resolve disputes or make adaptations, to ensure integration can be the efficient response to uncertainty or contractual incompleteness. Parties anticipate the possibility of future haggling or disputes, they may have little incentive to make specific investments for fear the investment could be wasted or expropriated (Klein, et al 2009). To the extent that integration allows a firm to protect specific investments, it again can be an efficient response to contractual incompleteness.

Williamson (2010) suggests a related but distinct set of inefficiencies inside organizations. These include low-powered incentives, and rent-seeking and informational bottlenecks that arise within managerial hierarchies. An implicit assumption in transaction cost theory is that disputes are relatively insensitive to the complexity, or uncertainty or specificity, of particular transactions. Therefore integration becomes optimal when hazards are more severe, but non-integrated production may be preferred for relatively straightforward transactions. In this perspective the large volume of transactions in terms of the huge tonnage of cereals and agricultural commodity in line supports the organization supports the argument in line with vertical integration. Through vertical integration the organization is able eliminate the opportunistic and inefficient behavior which results from the complexity or uncertainties that results from the organization outsourcing the core functions therefore engaging in contractual agreements which they cannot walk away from later without incurring substantial costs. (Joskow 2010).

### **2.2 The Property Rights Model (Grossman & Hart 2009)**

The property rights model is one of the first formal theories of integration that makes precise assumptions about the limits of contracting. The model focuses on how integration changes the contracting incentives to make specific investments. In the property rights theory, a firm is defined as a collection of physical assets. Decisions to integrate upstream or downstream are associated with shifts in asset ownership.

An example would be a manufacturer that purchases a supplier and takes control of its physical plant, or that integrates downstream and takes ownership of distribution outlets. (Moore, 2009). The standard version of the property rights model has three stages. The relevant parties first decide who should own which assets. Other decisions, or some of them, are left to be decided later. Then the parties make investment decisions. The investments are specific, some of their value is lost if the relationship breaks down. Determining whether integration is optimal, and which party should be the owner, requires a comparison of the costs and benefits, which can be complex. In the property rights model, the gap per se is not consequential for predictions about ownership (Holmstrom & Roberts, 2010). Instead, the relevant quantity is the degree to which ownership affects the marginal returns to non-contractible specific investments.

### 2.3 Capabilities Theory (Wernerfelt, 2012)

Capabilities theory focuses mainly on decisions at the boundary of the firm, and often on cases where firms integrate to internalize the transfer of some tangible good or service. In contrast, research on business strategy and organization theory frequently emphasizes the idea that firms may seek to expand or acquire other firms in order to leverage their internal capabilities or exploit superior management capabilities. This theory rests on two premises, the first is that organizations develop certain capabilities or know-how that is embodied by managers and employees, or in organizational routines. The second is that capabilities or knowledge cannot easily be traded or shared across firm boundaries. These ideas have received less attention in economic theory, although there is a range of work that speaks to related issues. (Wernerfelt, 2012) In Lucas' (2008) model of firm size, managerial talent is a scarce resource that can be leveraged by creating hierarchical organizations. Lucas uses the model to derive predictions about the size distribution of firms in the economy. Subsequent work has adapted his model to study the optimal organization of hierarchies. Clark & Bloom (2010) provide evidence that managerial practices can be an important factor in explaining productivity differences across firms.

### 2.4 The Conceptual Framework

Bogdan & Bilken (2003) describes conceptual framework as a structure that consists of certain abstract blocks which represent the observational, the experiential and analytical/synthetically aspects of a process of style being conceived.

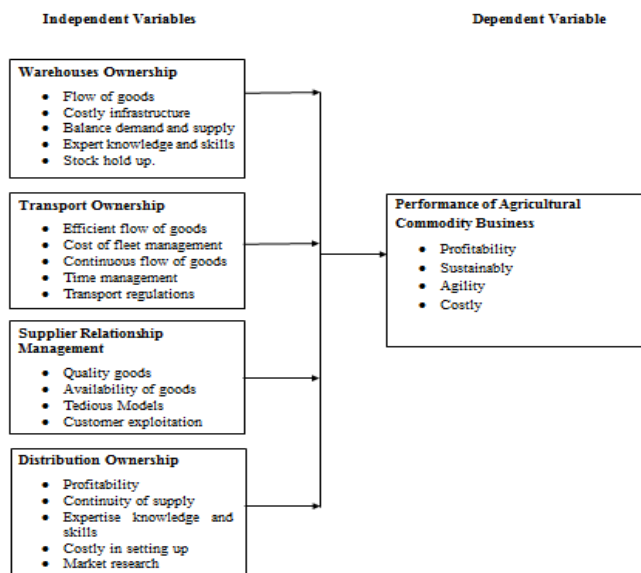


Figure 2.1. Conceptual Framework.

### 2.4 Effects of Vertical Integration on Organizational Performance

Dreyer *et al* (2001) discusses ways to overcome difficulties in carrying out empirical studies on the impact of vertical integration on performance in organizations more specifically on how to operationalize Vertical integration in such a setting by designing a measure that captures the actual 'level' of VI in this particular industry. Isaksen *et al*, (2002) further investigated the state of VI by means of finding the determinants for integrating vertically – primary uncertainty in the industry or the industry age. Based on these two studies this project further developed by trying to establish the proper way to measure VI and performance by elaborating thoroughly the research design before elucidating which measures to use for testing the impact from VI on performance.

#### 2.4.1 Effects of Ownership of Warehouses

The chartered institute of transport and logistics-(CILT-UK, 2008) asserts that warehousing is the function of storing goods to bridge the time gap between their production and demand and thus leads to time and place utility. Warehouse means any building structure or other protected enclosure which is used or may be used for the purpose of storing goods on behalf of the depositors but doesn't include cloakroom attached to hotels, railway station the premises of other public carrier alike. Also called a switching facility, distribution centers, consolidation terminals, break bulk and cross-dock facilities. Alan *et al*, (2009) states that the prime objective of most warehouses is to facilitate the movement of goods through the supply chain to end customer. There are many techniques used to reduce the need to hold inventories, such as flexible manufacturing systems, supply chain visibility and express delivery and many of these have been encompassed in a range of supply chain initiatives, for example just in time (JIT), collaborative planning, forecasting and replenishment (CPFR). However, as indicated above, an increase in the number of warehouses will also lower transportation costs and this is due to the fact that the warehouses will be closer to the target market and consequently transfers will be shorter in distance. This will also lead to reduction of the cost of lost sales with an increase in warehouses and this is connected to the level of customer service a company wishes to offer, since inferior customer service, indicated by lead-times, will cause a loss in the number of customers. This concept is only applicable where organization through a Make-or-Buy decision process, chooses not to invest in warehouses but lease out warehousing to reduce the huge cost of setting up the warehouse infrastructures.

#### 2.4.2 Effects of Supplier Relationship Management

Lysons & Farrington (2006) confirms that Supplier management may be defined as the aspect of purchasing or procurement concerned with rationalizing the supplier base and selecting, coordinating, appraising the performance of and developing the potential of suppliers and, where appropriate, building long-term collaborative relationship. Baily *et al*, (2005) discusses five methods in assessing supplier capability in SRM; the first method is through past performance which can only be used for supplier selection when items are brought in large quantities from several suppliers. Records of quality performance need to be available to the purchase decision maker and the buyer uses this information to give more business to better suppliers and phase out inadequate suppliers. The second method is reputation where potential suppliers can be asked to give references while the third one is visit and appraisal in order to make an assessment of quality

capability. The third method involves third party certification by independent body and the results are published or made available to clients or subscribers, the fourth is through evaluation of products by delivery of satisfactory goods by the supplier and their acceptance by the customer thus completing the transaction once payment has been made. The last method is through vendor accreditation schemes through rating of quality and the statistics will normally be gathered on the quality of supplies received. Victor *et al*, (2004) asserts that strategic supplier partnering is the term being used today to indicate close cooperation between buying and selling companies to achieve joint benefits. In this context the supplier are viewed as an integral part of the product or service delivery process. He further states that strategic supplier relationship provides a competitive edge to improve not simply supplier relationships, but also the broader shared responsibility to meet your company's needs.

#### 2.4.3 Effects of Ownership of Transport

In all organizations, transport is logistical cost hence should be outsourced; a quite common association is that logistics is about transportation and warehousing. In fact, in loose terms logistics can be said to concern the efficient flow of material and maybe the goods we see being transported by heavy commercial vehicles on our roads from producer to customer, or from one warehouse to another is the most distinct example of this. (Persson,2009).Barry *et al* .,2012) asserts that the cost of transport to outlying units is a major point against centralized, and the expense involved if the out stations are widely dispersed may possibly more than offset all the advantages gained from favorable factors. Deliveries from central stores to units must be organized on a routine basis to make best use of the transport, and unit- required urgently, because demand of this kind usually results in uneconomical use of vehicles.

The organization transport function is vertically integrated owned and management by the organization. This enables the organization to have the ability to leverage backward and forward in order to maximize efficiencies and create significant costs savings. Contrary to the above the organization is currently experiencing huge expenses because the fleet of heavy commercial vehicles is located in Mombasa location and all arising movement of cargo from are serviced by the fleet. The main cost incurred by the organization through ownership of the vehicles includes dynamic transport policies by the government and the high costs of fuel and spare parts costs in maintenance because of poor road infrastructure within the country.

#### 2.4.4 Effects of Distribution Ownership

Chopra, (2009) contends that distribution refers to the steps taken to move and store a product from the supplier stage to a customer stage in the supply chain. Distribution is a key driver of the overall profitability of a firm because it directly impacts both the supply chain cost and the customer experience. Good distribution can be used to achieve a variety of supply chain objectives ranging from low cost to high responsiveness. As a result, companies in the same industry often select very different distribution networks. The purpose of the distribution system is to bridge the gap between a company and its customers, the gap which is measured as geographical distance. Consequently a company needs to be physically close to the market in order to uphold a high level of customer service and this is achieved by holding inventory at multiple warehouses close to the customer. In order to achieve economies of scale, distribution should both physically and organizationally be centralized to a logistics

platform and separated from other functions in the channel, e.g. sales, and the reason for this being that logistics can be rendered more effective through this separation at the same time as sales can be more locally adapted to market specific demands (Abrahamsson & Brege, 2010). In a decentralized distribution system, where inventories are typically stocked at a local warehouse supplying a particular market, it is difficult to hold a full range of products. However, through the implementation of a central warehouse it is easier to hold a more complete product range in inventory that can even out oscillations in demand that occur on the various markets it supplies and consequently a central warehouse can show a higher stock availability. The result of this is that the cost of lost sales changes and the curve illustrating this takes on a new shape and shifts downwards.

#### 2.4.5 Measurement of Performance of vertical Integration

Vertical integration, or the lack of it, can have a significant impact on business performance. While some observers claim that adequate vertical integration can be crucial to survival, others blame excessive integration for causing corporate failure. ETC has undertaken extensive investment in infrastructure ownership through construction of permanent company owned warehouses, ownership of transport vehicles, plant processing machines for processing of foodstuffs. Vertical Integration strategy is difficult to reverse in regards to the high investment made on the infrastructural undertaken, emerging customer needs and volatile prices of commodity reverse hence the organization will lag in restructuring to take on new emerging competences along the supply chain.

### 3. Methodology

The researcher used a descriptive survey to investigate the effects of vertical integration on the performance of agricultural commodity business in Export Trading Co. Ltd. Creswell, (2013) states that, the descriptive method of research is to gather information about the present and the existing conditions. The descriptive research design is fast and economical as in regard to finances.

### 4. Research Findings and Discussion

#### 4.1 Effect of ownership of warehouses on the performance

Table 4.3. Effect of Ownership of Warehouses.

|                                                                                    | N  | Mini<br>mum | Maxi<br>mum | Mean | Std.<br>Deviation |
|------------------------------------------------------------------------------------|----|-------------|-------------|------|-------------------|
| Warehousing ownership helps bridging the gap of demand and supply                  | 40 | 1           | 5           | 4.60 | .955              |
| It is costly to invest in the ownership of warehouse infrastructure                | 40 | 1           | 5           | 4.70 | .853              |
| Warehouse ownership ensures smooth movement of goods from one location to another. | 40 | 1           | 5           | 4.75 | .840              |
| Ownership of warehouses requires investment in expertise knowledge and skills.     | 40 | 1           | 5           | 4.65 | 1.027             |
| Ownership of warehousing can lead to hold up of stock unnecessarily.               | 40 | 1           | 5           | 4.68 | .859              |
| Valid N (list wise)                                                                | 40 |             |             |      |                   |

The study sought to find out the effect of ownership of warehouses on the Performance of Agricultural Commodity Business. Table 4.3 summarizes respondents' level of agreement on how ownership of warehouses affects the performance of Agricultural Commodity Business. All the respondents strongly agreed that warehousing ownership helps bridging the gap of demand and supply; It is costly to invest in

the ownership of warehouse infrastructure, warehouse ownership ensures smooth movement of goods from one location to another, Ownership of warehouses requires investment in expertise knowledge and skills and that Ownership of warehousing can lead to hold up of stock unnecessarily. This was represented with a mean of 4.60, 4.70, 4.75, 4.65 and 4.68 respectively.

#### 4.2 Effects of Transport Ownership on the performance

**Table 4.4. Effects of Ownership of Transport on the Performance.**

|                                                                                            | N  | Mini mum | Maxi mum | Mean | Std. Deviation |
|--------------------------------------------------------------------------------------------|----|----------|----------|------|----------------|
| Transport ownership leads to efficient flow of goods to the customers.                     | 40 | 1        | 5        | 4.68 | .859           |
| Ownership of transport is a cost that can be avoided through outsourcing.                  | 40 | 1        | 5        | 4.63 | .868           |
| Ownership of transport is only important to the organization that has continuous goods     | 40 | 1        | 5        | 4.48 | .960           |
| A company that owns transport minimizes time that is spent in sourcing and hiring vehicles | 40 | 1        | 5        | 4.35 | 1.099          |
| Dynamic government regulations in transport industry has a cost impact for transporters    | 40 | 1        | 5        | 4.65 | .864           |
| Valid N (list wise)                                                                        | 40 |          |          |      |                |

Table 4.4 summarizes respondents' level of agreement on effect of ownership of transport on the Performance of Agricultural Commodity Business. The study sought to examine the effect of ownership of transport on the Performance of Agricultural Commodity Business. Majority of respondents strongly agreed that transport ownership leads to efficient flow of goods to the customers, ownership of transport is a cost that can be avoided through outsourcing, ownership of transport is only important to the organization that has continuous goods, and that dynamic government regulations in transport industry has a cost impact for transporters showing a mean of 4.68, 4.63, 4.48 and 4.65 respectively. A few respondents agreed to the statement that a company that owns transport minimizes time that is spent in sourcing and hiring vehicles with a mean of 4.35.

#### 4.3 Effects of Supplier Relationship Management (SRM) on the Performance

**Table 4.5. Effects of Supplier Relationship Management (SRM) on the performance.**

|                                                                  | N  | Mini Mum | Maxi mum | Mean | Std. Deviation |
|------------------------------------------------------------------|----|----------|----------|------|----------------|
| SRM ensures supply of quality products.                          | 40 | 1        | 5        | 4.65 | .834           |
| SRM ensures critical products available.                         | 40 | 1        | 5        | 4.50 | .961           |
| SRM requires people with the right skills and knowledge          | 40 | 1        | 5        | 4.68 | .859           |
| SRM requires appropriate models to create competitive advantage. | 40 | 1        | 5        | 4.55 | 1.037          |
| Through SRM exploitation of customers by price fixing may arise  | 40 | 1        | 5        | 4.60 | .871           |
| Valid N (list wise)                                              | 40 |          |          |      |                |

From the above table 4.5, respondents strongly agreed that supplier relationship ensures supply of quality products with a mean score of 4.65; respondents strongly agreed with the statement that supplier relationship ensures critical products available a mean of 4.50, respondents also strongly agreed that supplier relationship management requires people with the right skills and knowledge with a mean score of 4.68. Respondents when asked if supplier relationship requires appropriate models to create competitive advantage and if through SRM exploitation of customers by price fixing may arise, they strongly agreed with a mean of 4.55 and 4.60 respectively.

#### 4.4 Effects of Distribution Ownership on the Performance

The respondent were asked on a five point Likert scale where 5 is strongly agree, 4 agree, 3 neutral, 2 disagree and 1 strongly disagree to state how they agree with the given statements that distribution ownership affects the performance agricultural commodity business.

**Table 4.6. Effects of distribution ownership on the performance**

|                                                                                                   | N  | Mini mum | Maxi mum | Mean | Std. Deviation |
|---------------------------------------------------------------------------------------------------|----|----------|----------|------|----------------|
| Distribution ownership ensures continuous supply of goods within the market.                      | 40 | 1        | 5        | 4.55 | .876           |
| Ownership of distribution helps company gain more profit                                          | 40 | 1        | 5        | 4.35 | 1.099          |
| Ownership of distribution requires an organization to invest in expertise knowledge and skills.   | 40 | 1        | 5        | 4.60 | .900           |
| A good distribution network is time consuming and costly to set up.                               | 40 | 1        | 5        | 4.52 | 1.037          |
| Through distribution ownership organizations can record their product performances in the market. | 40 | 1        | 5        | 4.70 | .853           |
| Valid N (list wise)                                                                               | 40 |          |          |      |                |

From the above table, respondents strongly agreed that Distribution ownership ensures continuous supply of goods within the market with a mean of 4.55. Respondents agreed that Ownership of distribution helps company gain more profit with a mean of 4.35. Respondents also strongly agreed that ownership of distribution requires an organization to invest in expertise knowledge and skills with a mean of 4.60, respondents further strongly agreed that a good distribution network is time consuming and costly to set up with a mean of 4.52. When respondents were asked if through distribution ownership organizations can record their product performances in the market they further strongly agreed a mean of 4.70.

#### 4.5 Performance of Agricultural Commodity Business

The respondent were asked on a five point Likert scale where 5 is strongly agree, 4 agree, 3 neutral, 2 disagree and 1 strongly disagree to state how they agree with the given on Performance of Agricultural Commodity Business

**Table 4.7. Performance of Agricultural Commodity Business.**

|                                                       | N  | Mini mum | Maxi mum | Mean | Std. Deviation |
|-------------------------------------------------------|----|----------|----------|------|----------------|
| Profits are difficult to be realized                  | 40 | 1        | 5        | 4.25 | 1.214          |
| Sustainability of the business is hard                | 40 | 1        | 5        | 4.52 | 1.037          |
| Flexibility of operations and activities is difficult | 40 | 1        | 5        | 4.55 | .876           |
| Unnecessary investment may arise                      | 40 | 1        | 5        | 4.35 | 1.099          |
| A lot of time is spent on setting up                  | 40 | 1        | 5        | 4.43 | .874           |
| Valid N (list wise)                                   | 40 |          |          |      |                |

From the above table, respondents agreed that Profits are difficult to be realized with a mean of 4.25. Respondents strongly agreed that Sustainability of the business is hard with a mean of 4.52. Respondents strongly agreed that Flexibility of operations and activities is difficult with a mean of 4.60. Respondents strongly agreed with the statement that unnecessary investment may arise with a mean of 4.55. Respondents lastly agreed that a lot of time is spent on setting up with a mean of 4.43

#### 4.6 Coefficient of Correlation

While showing the relationship between the study variables and their findings, the researcher used the Karl Pearson's coefficient of correlation ( $r$ ) as indicated in Table 4.15. According to the findings, it was clear that there was a positive correlation between performance of agricultural commodity business and ownership of warehousing as represented by a correlation figure of 0.989; performance of agricultural commodity business and transport ownership shown by a correlation figure of 0.983; there was also a positive correlation between performance of agricultural commodity business and Supplier relationship with a correlation value of 0.986; also a positive correlation between performance of agricultural commodity business and distribution ownership with a correlation figure of 0.979 as indicated in table 4.6 below. This showed that there was a strong positive correlation highest being noted in ownership of warehousing and lowest positive correlation in distribution ownership.

**Table 4.8 Correlations**

|                            | Perform ance of A.C.B | Distribu tion ownersh ip | Transp ort owners hip | Supplier relations hip | Distribu tion ownersh ip |
|----------------------------|-----------------------|--------------------------|-----------------------|------------------------|--------------------------|
| Performa nce of A.C.B      | 1                     |                          |                       |                        |                          |
| Ownersh ip of warehou sing | .989                  | 1                        |                       |                        |                          |
| Transpor t ownershi p      | .983                  | .993                     | 1                     |                        |                          |
| Supplier relations hip     | .986                  | .996                     | .994                  | 1                      |                          |
| Distribut ion ownershi p   | .979                  | .977                     | .969                  | .985                   | 1                        |

#### 4.7 Coefficient of Determination (R<sup>2</sup>)

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable that is explained by all independent variables. Table 4.9 shows that the coefficient of determination R Square is 0.983. To obtain the best we use Adjusted R Square with is represented by a figure 0.981. From the findings therefore this means that 98.1% of the performance of agricultural commodity business is attributed and determined by combination of the four independent factors investigated in this study which include ownership of warehouse, transport ownership, supplier relationship and distribution ownership. The remaining percentage is represented by factors not researched in this study.

**Table 4.9 Coefficient of Determination (R<sup>2</sup>)**

#### Model Summary

| Model | R                 | R Squar e | Adjuste d R Square | Std. Error of the Estim at e | Change Statistics |           |      |      |                |
|-------|-------------------|-----------|--------------------|------------------------------|-------------------|-----------|------|------|----------------|
|       |                   |           |                    |                              | R Square Chang e  | F Chang e | df 1 | df 2 | Sig. F Chang e |
| 1     | .992 <sub>a</sub> | .983      | .981               | .12276                       | .983              | 516.687   | 4    | 35   | .000           |

Predictors: (Constant), Ownership of warehouse, Transport ownership, Supplier relationship, Distribution ownership.

#### 4.8 ANOVA

The study used Analysis of Variance also commonly referred to as (ANOVA). This was used to establish the significance of the regression model from which f-significance at the value of (P) is less than 0.05. The study model was statistically significant in predicting the effect of vertical integration on the performance of agricultural commodity business. This was true as indicated in table where the Df is (4, 35) at significant level of 0.00 thus less than the (P) 0.05. This therefore means that the regression model had a confidence level of above 95% hence high reliability of the results obtained. The null hypothesis therefore is rejected and an alternative one adopted.

**Table 4.10 ANOVA**

| ANOVA <sup>a</sup> |                |    |             |         |                   |
|--------------------|----------------|----|-------------|---------|-------------------|
| Model              | Sum of Squares | Df | Mean Square | F       | Sig.              |
| 1 Regression       | 31.146         | 4  | 7.786       | 516.687 | .000 <sup>b</sup> |
| Residual           | .527           | 35 | .015        |         |                   |
| Total              | 31.673         | 39 |             |         |                   |

a. Dependent Variable: Performance of A.C.B

b. Predictors: (Constant), Ownership of warehousing, Transport ownership, Supplier relationship, Distribution ownership

#### 4.9 Multiple Regressions

The researcher conducted a multiple regression analysis as shown in Table 4.10 to determine the relationship management between performance of agricultural commodity business and the four variables investigated in this study (Ownership of Warehousing, Transport ownership, Supplier Relationship Management and Distribution Ownership). The regression equation was:

$$Y = 0.000 + 0.918X_1 + 0.320X_2 + -0.657X_3 + 0.416X_4 + \varepsilon$$

Where

$\alpha$ : is a constant term,

$\beta_n$ : coefficients to be determined

$\varepsilon$ : the error term.

Y: the dependent variable (Performance of A.C.B)

X1: Ownership of warehousing

X2: Transport ownership

X3: Supplier relationship



## X4: Distribution ownership

According to the regression equation established in, taking all factors constant at zero, Performance of Agricultural Commodity Business will be 0.000. The data findings analyzed also shows that taking all other independent variables at zero; a unit increase in Ownership of warehousing will lead to a 0.918 increase in Performance of Agricultural Commodity Business; A unit increase in Transport ownership will lead to a 0.320 increase in Performance of Agricultural Commodity Business; a unit decrease in Supplier relationship will lead to a -0.657 decrease in Performance of Agricultural Commodity Business; a unit increase in Distribution ownership will lead to a 0.416 increase in Performance of Agricultural Commodity Business. This therefore implies that four variables have a positive relationship with Performance of Agricultural Commodity Business contributing most to the dependent variable

**Table 4.11 Multiple Regression Analysis**

| Coefficients <sup>a</sup> |                          |                             |            |                           |        |      |
|---------------------------|--------------------------|-----------------------------|------------|---------------------------|--------|------|
| Model                     |                          | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|                           |                          | B                           | Std. Error |                           |        |      |
| 1                         | (Constant)               | .000                        | .120       |                           | -.004  | .997 |
|                           | Ownership of warehousing | .918                        | .260       | .904                      | 3.530  | .001 |
|                           | Transport ownership      | .320                        | .231       | .317                      | 1.386  | .175 |
|                           | Supplier relationship    | -.657                       | .355       | -.676                     | -1.852 | .073 |
|                           | Distribution ownership   | .416                        | .130       | .454                      | 3.200  | .003 |

a. Dependent Variable: Performance of A.C.B

**5. Conclusions**

This study tested the research framework with key variables as vertical integration and organization performance. Findings indicated that the organization attests to its vertical integration with majority agreeing to the four vertical integration attributes of ownership of warehouses, transport ownership, supplier relationship management and distribution ownership. This study also reveals a strong and positive relationship between vertical integration and the organization performance with four variables; ownership of warehouses, transport ownership, supplier relationship management and distribution ownership being strong and positively related to organization performance.

**6. Recommendations**

Based on the findings and the conclusion of the study the effects of vertical integration on performance of agricultural commodity business, the research came up with the following recommendations;

1. Organizations seeking to vertically integrate the operation to their competitive advantage should identify key capabilities that enhance the profitability and wealth generation goals in line with the policies set out by the organization.
2. The organizations investing in ownership of warehouses, Supplier relationship management and distribution ownership should conduct continuous training of their employee to better equip them with knowledge and skills to ensure success of the organization.
3. Market forecast is paramount for organization that seeks to gain control of their operations to ensure long term benefits are eminent and the future will remain promising and beaming for the organization to carry out the same operations competitively.

4. Investment in technology for vertically integrated organization is important to enhance the entire organization performance and output and in identifying areas that require specialized skills for a coordinated operations that play a positive role in achievement of maximum benefit for the whole organization.

**7. Areas For Further Research**

This study focused on the effects of vertical integration on the performance of agricultural commodity business in Export Trading Company Ltd. There is still need for further research focusing on;

1. To determine the strategic role of vertical integration on the performance of various industries.
2. Effects of emerging trends of supply chain on the performance of organization
3. Factors affecting supply chain success in organizations.

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