

**APPLICATION OF VERTICAL INTEGRATION IN THE
TANZANIAN CONSTRUCTION INDUSTRY**

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**MSc. (Construction Economics and Management) Dissertation
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**APPLICATION OF VERTICAL INTEGRATION IN THE
TANZANIAN CONSTRUCTION INDUSTRY**

By

Catherine Francis Luambano

**A dissertation Submitted in Partial Fulfilment of the Requirements of the
Degree of Master of Science in Construction Economics and Management of
Ardhi University**

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CERTIFICATION

The undersigned certifies that she has read and hereby recommends for acceptance by the Ardhi University a dissertation titled “*Application of Vertical Integration in the Tanzanian Construction Industry*” in fulfillment of the requirements for degree of MSc. in Construction Economics and Management, Ardhi University.

Dr. Kavishe Neema.
(Dissertation Supervisor)

Date -----

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I, **Catherine Francis Luambano**, hereby declare that the contents of this dissertation are the result of my own study and findings, and to the best of my knowledge, they have never been presented elsewhere for a Diploma, Degree or any professional awards in any institution of higher learning.

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Catherine Francis Luambano

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Last, but not least, my friends Diana Mitimangi and Severin Privatus: words cannot express how grateful I am for your support throughout.

DEDICATION

This dissertation is with sincere humbleness, dedicated to the Almighty GOD who gave me strength to accomplish this work. Secondly, I dedicate this dissertation to my mother Mrs. AGNES LUAMBANO: My deepest desire to make you proud pushes me to accomplish even the toughest things.

Lastly, but very importantly, this dissertation is dedicated to my young brother MIKE LUAMBANO, always go after your dreams.

ABSTRACT

Vertical integration originated from the manufacturing industry in the last quarter of the nineteenth century in the United States of America as means of reducing per unit cost of production. It was later adopted by the construction industry as means of solving some of the problems associated with construction. Despite its many benefits, it is still uncommon in the Tanzanian construction industry. Since Vertical integration is originally from the manufacturing industry and relatively a new concept in the Tanzanian construction industry, it is worth looking at the way it is currently applied, to see its driving forces, benefits, and challenges that construction firms face, hence recommend the best way it can fit into the Tanzanian construction industry to make it more feasible and maximize its benefits.

A qualitative research approach was adopted. Through a case study design an interview survey was conducted with 15 respondents from 3 case companies in Tanzania. The collected data and interview transcripts were analyzed using content analysis method. The study showed that the main driving factor that motivates Tanzanian contractors to integrate is the increase in competition that has come with the gradual growth of the industry while cost control and quality maintenance were the main benefits identified. The absence of contracts that allow for vertically integrated firms to prosper was the most mentioned challenge which calls for government's intervention.

The study emphasizes the need to adopt other procurement systems other than the traditional procurement system to support the vertically integrated firms. A call for change to the government, being one of the biggest clients for large construction projects.

The key contributions of this research include; bringing awareness on the topic as there is barely any study on vertical integration in the Tanzanian construction industry hence provide necessary knowledge for any firms interested in applying vertical integration to help them understand how to deal with challenges associated with it so as to enhance its benefits and being useful to future researchers and academicians wishing to carry out further study on the field. Moreover, this study addresses the government on the role it needs to play in supporting vertically integrated Tanzanian construction firms.

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CHAPTER ONE

INTRODUCTION

1.1 Background information

Vertical Integration is a strategy where a company owns or controls other stages of the production chain. According to Ive and Gruneberg (2000) vertical integration refers to a strategy where organizations that carry out separate tasks in the same chain of production, come together with a joined set of goals and objectives under a common ownership. The client, consultant, contractor, manufactures and suppliers of materials are some of the key players in a construction production chain. When one player takes control of several of the production steps involved in construction that is what's called vertical integration. It involves entrance into construction related markets such as preconstruction activities like production of construction materials, post construction activities such as operation of power plants or complimentary activities such as manufacturing of furniture.

Vertical integration originated from the manufacturing industry as a means of reducing per unit cost of products. It happened during the time of very great volatility, which was later named the second industrial revolution (Casson and Godley 2007). It started in the last quarter of the nineteenth century in the United States of America. According to Chandler (1977), it came in three phases, the period of market expansion, then necessary developments in transportation to permit mass markets to begin and lastly the phase which saw the integration between mass production and mass distribution among a few pioneer firms who could only sell in volume if they created a way in which they could distribute in volume. Companies would supply their own raw materials, process, then transport and distribute the products by themselves.

Vertical integration was later adopted by the construction industry as means of solving some of the problems associated with construction. According to Latham (1994) and Egan (1998) the construction industry is associated with a couple of problems which can be summarized into three groups; the product development process, e.g., fragmented process, problems related to the stakeholders, e.g., absence of integration and the contracting process, e.g., supply chain problems.

Some of the benefits of vertical integration in construction include quality control and assurance. Note that quality is one of the three indicators of a successful project (Baccarini, 1999). According to Singh et al. (2004) 74% of quality related problems can be solved by adopting vertical integration. Other benefits include, reducing contracting frictions (Bresnahan and Levin, 2012). Time, resources, and energy wasted to resolve contractual problems could be put into production instead, hence maximizing production. Increasing company's involvement in the production chain within which it operates (Barney, 1997), this eliminates late delivery problems, reduce transportation cost, and gives a firm better control over the quality of products. Other benefits include, improving production chain coordination and capturing upstream and downstream profit margins (Clinton, Manna, and Marco 2008). Harrigan (1983) mentioned that high degree of vertical integration can be rewarding in some competitive situations.

The Tanzanian construction industry has continued to grow gradually over the years as a consequence of the country's investments in building and infrastructure projects (Kikwasi and Escalante, 2018). This growth has influenced a dramatic increase in competition within the industry. Guan and Rehme (2012) argued that for a firm to be competitive in this modern age and time, it has to be supple and spontaneous. There is a need to change their structure in such a way that is going to reduce total production costs so as to have low rates and win tenders.

1.2 Research Gap

A research gap is a missing piece in a particular field of study (Fernandez, 2016). It involves a lack of empirical studies on a certain area of study in the field from which another research can be done to fill the missing piece. It is the difference between the knowledge that already exists to that which is required. Table 1.1 below shows previous studies related to vertical integration in the construction industry. The literature search strategy for selection of these studies was first to identify the search terms, which were “vertical integration” and “diversification strategies”, then from online sources such as Emerald and Google Scholar, the literatures were filtered to only those that relate to construction. From the search, the researcher could not find and literature on vertical integration in construction done in Tanzania.

Table 1.1: Summary of previous studies related to vertical integration in the construction industry

TITLE	AUTHOR	COUNTRY	FOCUS
Vertical business integration strategies for construction	Krippaehne et al., (1992)	United States of America (USA)	A specific vertical integration model developed by Kathryn Harrigan of Columbia University is explained and correlations to the construction industry established.
Effects of vertical diversification on organizational competitiveness	Egessa, (2014)	Kenya	Analyze the effect of vertical diversification on organizational competitiveness of firms in Kenya.
Relationship between vertical integration and performance of construction firms in Kenya	Gitonga, (2011)	Kenya	The study sought to establish if there is any relationship between the degree of vertical integration and performance of construction firms in Kenya.
Impact of diversification strategy on construction organizations corporate level performance	Al Sayegh, (2010)	United Arab Emirates (UAE)	Vertical integration and other diversification strategies as a strategic direction at the corporate level.
Investigating the relationship between construction supply chain integration and sustainable use of material: Evidence from China.	Zeng et al., (2018)	China	An empirical investigation was carried out to check how integration in construction could contribute to sustainable use of materials.
Make and buy: Outsourcing, Vertical Integration and Cost Reduction.	Loertscher and Riordan, (2017)	United States of America (USA)	Effect of vertical integration on cost of projects.

There's barely any study on vertical integration in relation to the Tanzanian construction industry meaning there is a knowledge gap. This study assessed the application of vertical integration in the construction industry in Tanzania in pursuit to fill in the said gap.

1.3 Statement of the problem

Vertical integration is common in developed countries across industries because of benefits that come with it such as, minimizing contracting frictions (Bresnahan and Levin, 2012). Increasing a company's involvement in the production chain within which it operates (Barney, 1997), improving production chain coordination, capturing upstream and downstream profit margins (Clinton et al. 2008). Harrigan (1983) explained that in competitive situations, the higher the degree of vertical integration the more the reward.

Despite its many benefits, vertical integration is still uncommon in the Tanzanian construction industry. Many firms find it easier to outsource most of their building materials and machinery, traditional method of procurement is more common where designing is done by a different company from that which does the actual construction Kamala (2000), firms largely depend on other firms for transportation of materials. Overall, one could say the Tanzanian construction industry is overly fragmented as almost each step in the production chain is played by a different player for the most part.

Considering the fact that vertical integration is originally from the manufacturing industry, it's worth looking at the way it is currently applied in the Tanzanian construction industry to see its driving forces, benefits and challenges that contractors face, so as to recommend the best way it can fit into the Tanzanian construction industry to make the more feasible and maximize its benefits because truth is there are a lot of benefits in a carefully applied vertical integration system (Clinton et al. 2008).

1.4 Objectives of the study

1.4.1 Main Objective

The study aimed to assess the application of vertical integration in the Tanzanian construction industry.

1.4.2 Specific Objective

- i. To identify the driving factors to vertical integration for contracting firms in Tanzania.
- ii. To discern the benefits of vertical integration in relation to the Tanzanian construction industry.
- iii. To assess the challenges of vertical integration strategy in relation to the construction industry.
- iv. To propose the best ways that Tanzanian contractors can use to guarantee a smooth operating vertically integrated system and maximize its benefits.

1.5 Research questions

- i. Which factors lead to a vertical integration decision by contracting firms?
- ii. What are the benefits of vertical integration in relation to the Tanzanian construction industry?

- iii. What are the challenges of vertical integration strategy in construction?
- iv. What should be done to guarantee a smooth operating vertically integrated system in construction?

1.6 Significance of the study

- i. This research will contribute to the existing literature and be useful to future researchers and academicians wishing to carry out further study on the field.
- ii. Considering vertical integration is not very common in the Tanzanian construction industry, this study will bring awareness on the topic and provide necessary knowledge for any firms interested in applying vertical integration to help them understand how to deal with challenges associated with it so as to enhance its benefits.
- iii. The research will provide information that can help construction parties, policy makers and the government at large to make improvements within the industry.

1.7 Scope of the study

The study was carried out in Tanzania, specifically in Dar-es-Salaam region involving construction firms which have exercised vertical integration.

1.8 Organization of the dissertation

This research is divided into five chapters. The first chapter is the introduction of the study which contains the background of the study, research gap, problem statement, research objectives, significance of the study, research questions, and scope of the study. The second chapter is literature review where various studies were reviewed to generate concepts and variables related to the study are discussed. Chapter three will be methodology that was used to carry out this research which includes research design and process, data collection techniques as well as research strategy will come in chapter three. Chapter four will have presentation of the findings on application of vertical integration in the Tanzanian construction industry. And lastly in chapter five, the conclusion of this study after careful analysis of data, and then recommendations. Consider figure 1.1 below summarizing the organization of the study.

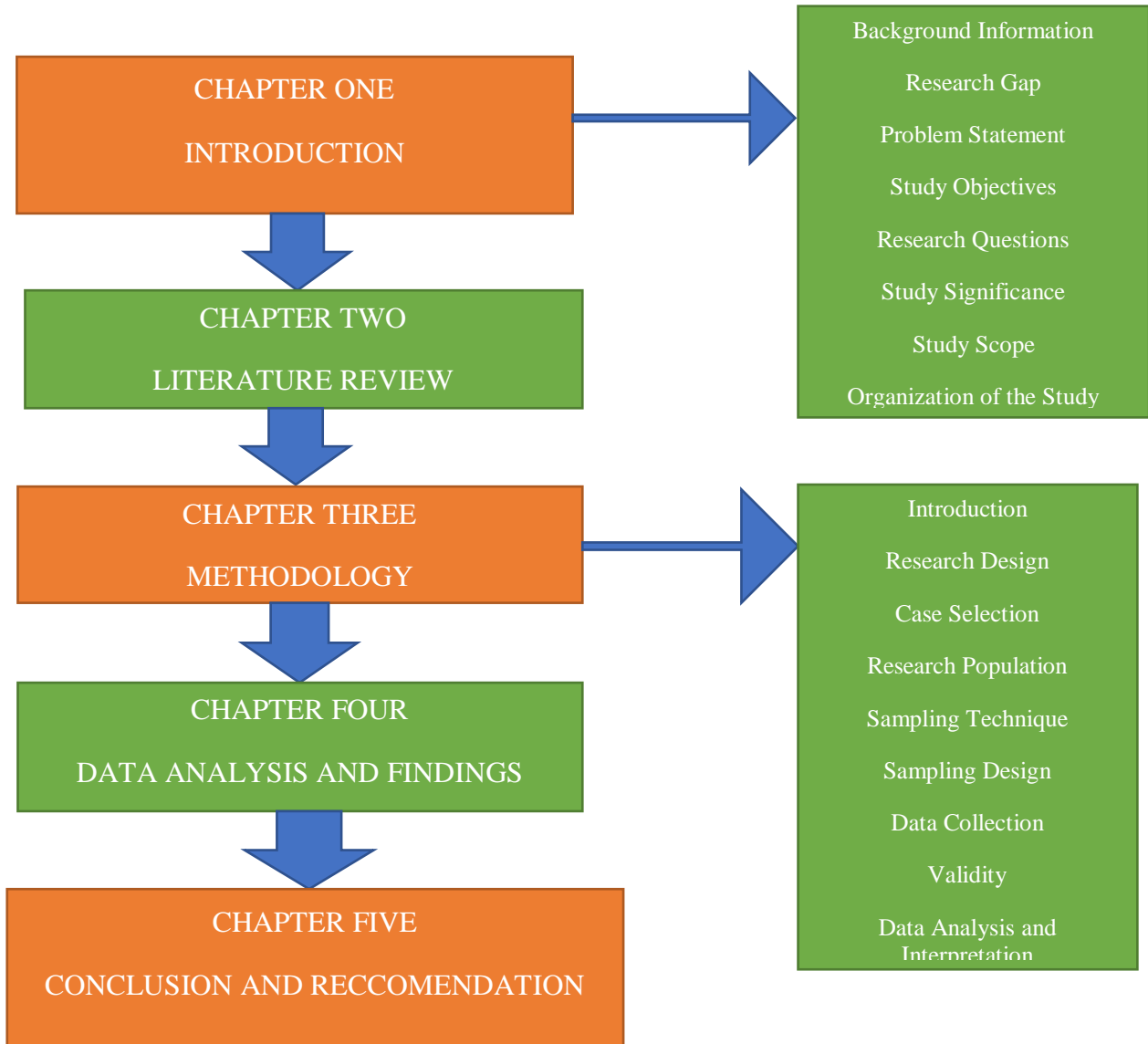


Figure 1.1: Summary of the organization of the study

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

According to De Los Reyes and Kazdin (2008) the key aim of a literature review is to help readers to understand the entire body of available notes concerning a subject topic. It is a survey of scholarly articles, books and other sources relevant to a particular issue, area of research or theory. The objective of literature review is to summarize the state of the art in that field. Ramdhani et al (2014) highlighted that it gives an outline of what has already been said, the questions asked, the main authors, prevailing hypothesis and theories and the methods and methodologies which are suitable and practical. Below is the relevant literature review for this study.

2.2 The concept of vertical Integration

According to Al Sayegh (2010) vertical integration can be defined as a related(concentric) diversification strategy. Related diversification involves divergence into markets that relate to construction such as preconstruction activities like material supply, post construction activities such buildings maintenance or complimentary activities such as interior designing. According to Dikmen and Birgonul (2003) the reasons for related diversification include controlling quality, quantity, and price of suppliers.

Vertical integration is a diversification strategy that mainly involve the acquisition of firms that supply the acquiring firm with inputs or new customers for its outputs (Pearce and Robinson, 2010). It is usually one of the first diversification strategies that firms apply. In a vertically integrated system, the roles of developer, supplier, designer, and builder are all done by one organization. A classic example is the design and build system (Oyegoke et al., 2010).

Vertical integration strategy increases a company's involvement in the production chain within which it operates (Barney 1997). Vertical integration could either be forward or backwards (Perault and McCarthy, 2005).

2.2.1 Forward Vertical Integration

Forward integration happens when a company progresses towards the end user in the production chain (Adeleke, et al., 2019). It is when a company involves itself in activities that succeed them in the production chain. For example, in construction when a contractor diversifies into real estate where they can sell buildings, this is what is referred to as forward vertical integration. Forward integration allows a company to have more dominance on the demand side (Lin, et al. (2013). Barney (2007) insists that forward vertical integration allows a firm to have more control of how its products are sold and serviced. Other examples of forward integration in construction are operation and management of buildings and/structures and maintenance and repair.

2.2.2 Backwards Vertical Integration

Backward vertical integration happens when a firm involves itself with activities preceding it in the production chain. It is when a firm moves towards the input of the subject product or service (Adeleke, et al., 2019). Thomas (2010) explained that backwards integration involves diversification towards the bottom of the production chain like the sources of raw materials gaining more control over quality and proportions of such materials. Barney (2007) argued in agreement that Backwards integration allows the diversifying company to gain control over the quality of the supplies being purchased. Davis and Pitts (2004) stated that the ability to control inputs in the production chain can decrease defect rates and hence gain the firm a huge competitive advantage. Other examples of backward integration in construction are when a firm acquires a firm that makes or supplies construction machinery and tools for example compactors and research and development such as looking into creating and developing new mechanical and electrical systems into buildings or experimenting with alternative materials for construction (Al Sayegh, 2010). Fitzgerald et al (1991) stated that the type of backward vertical integration either partly or wholly into construction machinery is the source of large profits although it requires huge amounts of capital. Consider figure 2.1 below showing related Diversification Options for Contractors.

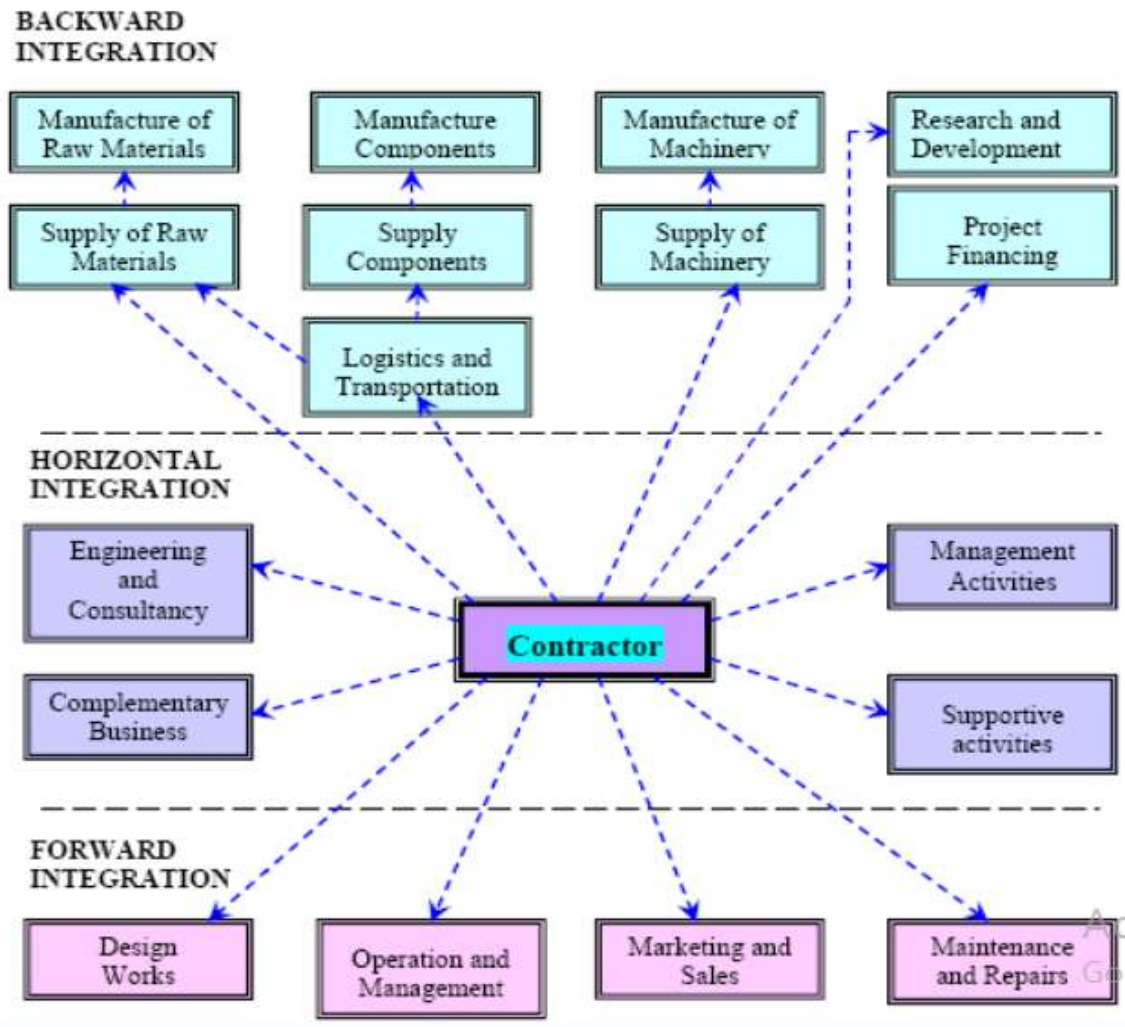


Figure 2.1: Diversification Options for Contractors

Source: Hopkins and Pitts, (2000).

2.3 Types of Vertical Integration

According to Harrigan (1983) there are four generic types of vertical integration strategies namely, Full integration, Tapered Integration, Quasi Integration and Contracts.

2.3.1 Full Integration

Full integration is when a firm buys or sells all their requirements for a particular product or service internally. It's when there is an internal source of a particular thing they need. Oliver (1997) said full integration should be applied when a firm wants to increase quality control. It's worth understanding that a firm does not necessarily need to own 100% of another firm for it to be considered as fully integrated for a certain need.

2.3.2 Taper Integration

When a firm depends on another firm for part of their needs, this is what is called taper integration. Basically, they make or sell some of their requirements in-house and purchase or sell what they need or have in excess respectively. The key in a taper integrated system is to find a useful balance between the need to have control of the production chain and the need to still have business flexibility. The biggest advantage of taper integration is it protects the firm from risks that are associated with increasing cost of production and handling an additional venture. Significant value can be added by outsourcing from outside suppliers for requirements which cost a lot to produce internally (Oliver, 1997).

2.3.3 Quasi Integration

Quasi integration is when a firm does not own 100% of adjacent business but may use or sell all their products, which is why there is a massive administrative cost involved with this type of integration. The means by which firms control adjacent units without having 100% ownership of them vary. The relationship between firms could take the form of cooperative ventures, minority equity agreement, loans or loan guarantees pre-purchase credits. The advantage of quasi-integration is that it allows a great flexibility when it comes to responding to changing conditions, but the problem is it exhibits higher percentages of ownership equity at risk (Nayyar, 1993). Robert, Bob, and Jorge (1992) argued that this strategy allows the general contractor to be more flexible in response to market conditions since it takes away market-niche constraints and can be managed in portfolio fashion.

2.3.4 Contracting

Contracting does not involve any internal integration. Whatever a company can do or produce for itself can be outsourced as well. It's important to know when to use contracting, especially for highly spontaneous industries like the construction industry (Sayegh, 2010). A contracting company can contract a supplier of building material to supply for them for ten years maybe. This reduces the risks that comes with having two adjacent businesses.

2.4 Factors affecting vertical integration strategies

According to Kathryn (1983), there are four factors that could affect the decision of a firm to either go for full vertical integration, taper integration, quasi-integration or contracting at a particular time. These factors are phase of industry development, corporate strategy objectives, industry volatility and bargaining power. Phase of industry development and industry structure volatility have to do with the steadiness of the domain within which the firm operates while corporate strategy objectives and bargaining power show the firm's ability to adopt a particular vertical strategy.

2.4.1 Phase of industry development

When the industry enters a new phase in its development it becomes very unstable in the sense that demand conditions change and become more unpredictable. During this time integration is usually low. Going forward, as the industry stabilizes within the new phase with demand conditions becoming more predictable and some competition patterns starting to be recognized as being more successful than others, the degree of internal integration taken increases. It's important to note that the industry becomes unstable again towards the end of a phase and usually integration is low then as well.

2.4.2 Volatility of industry structure

The construction industry can be considered as volatile because it encounters inconsistent and recurrent demands, has low profits and its competitors change strategy rapidly (Robert et al. 1992). When the industry is experiencing rapid changes in its structure, spontaneously changing competitors' positions in the market vertical integration would not be profitable. At a point when the business is unstable, it is hard for the firm to integrate (Oliver, 1997). Harrigan (1983) went on to explain that the only way high degrees of integration would succeed is if the firm enjoys the following;

- i. A monopoly and monopsony position in upward and downward streams
- ii. Power to raise entry barriers to reduce competition
- iii. Economies of scale through adopting new technologies which make the production process less costly
- iv. Structural traits that minimize the possibility of competition to become volatile

2.4.3 Bargaining power

Luo (2001) defined bargaining power as bargainer's ability to set conversation boundaries, win compromises from the other party, and slant the result of negotiations towards its ideal ownership alternative. In simple words, it is the ability of opposite parts in a situation to exercise influence over the other part. Bargaining power is important in construction as it reduces asset inflexibility which in turn exposes competitor's assets to demand fluctuations instead (Luo, 2001). Harrigan (1983) went on to explain that a firm with bargaining power can do the following;

- i. Control suppliers and distributors in terms of prices, conditions and delivery timetables.
- ii. Avoid paying any freight costs that suppliers or distributors need to take responsibility of
- iii. Get superior information regarding demand.

In conclusion firms with bargaining power don't have to be as highly integrated as their counter parts without having the ability to dictate forward and backwards members of the industry.

2.4.4 Corporate strategy objectives.

For any business to work, strategy objectives must be reflected through the actual strategies that a firm chooses to adopt. In making sure corporate strategy objectives and business goals reconcile competitive efforts involving leadership are best suited to higher levels of integration than seeking after a nonexclusive center strategy.

Review of integration policies at corporate level is necessary for the following reasons;

- i. Realize risk/return performance that's acceptable for the firm
- ii. Make sure all business units bring in acceptable profits
- iii. Utilize the existing or develop new unique firm resources
- iv. Make sure skilled employees and other nonphysical assets are retained through well designed opportunities for integration.

Consider figure 2.2 below illustrating factors affecting vertical integration strategies.

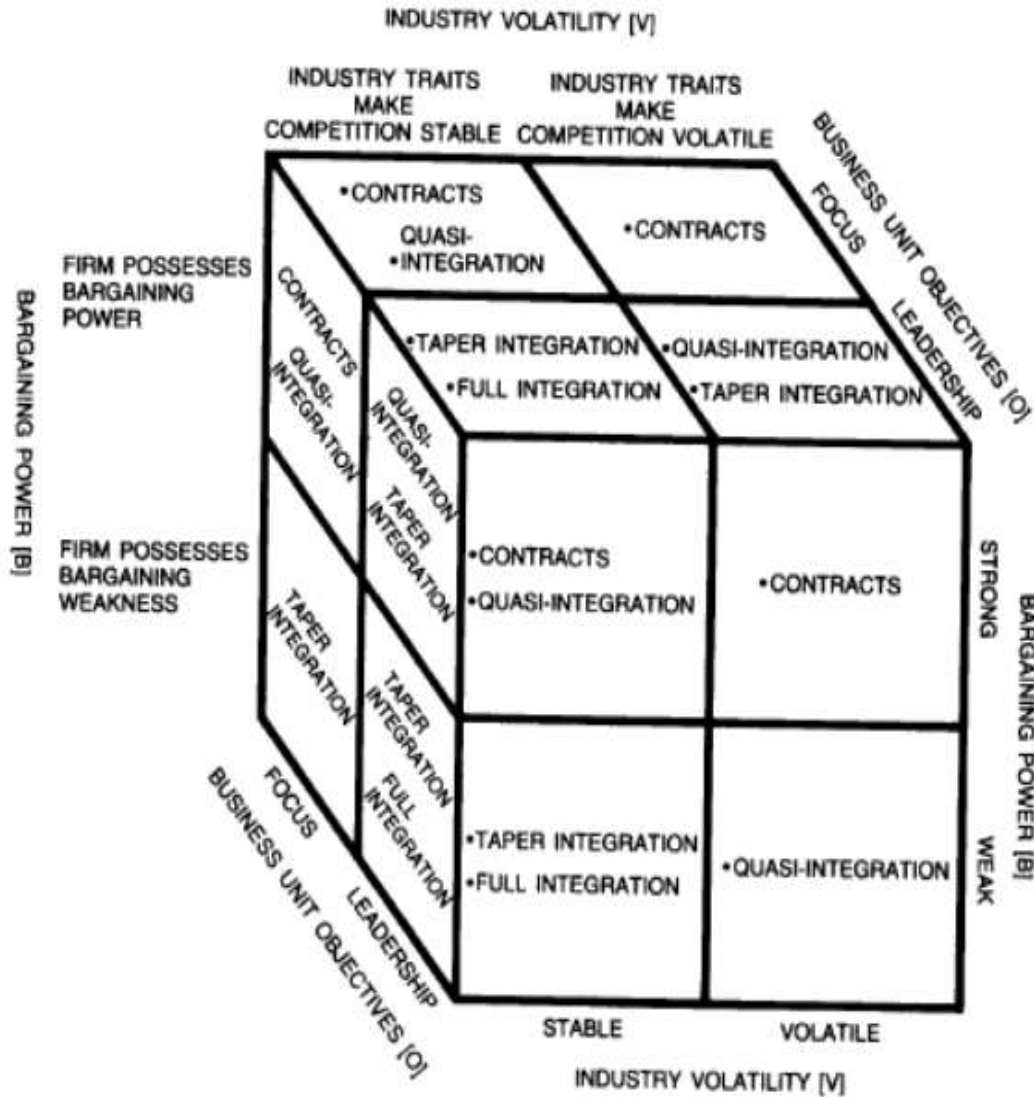


Figure 2.2: Factors affecting vertical integration strategies

Source: hrm Harrigan, (1983)

2.5 Driving factors to vertical integration

A driving factor is something that has the power to cause something else to happen. In other words, it's something that strongly influences people and makes them do something. According to Fawcett (2008) the driving factors to vertical integration can be divided into two groups, external factors and its prospective benefits. Below are the driving factors to vertical integration as summarized in Table 2.1 at the end of the section.

Cook and Garver (2002) explained that vertical integration can be motivated by the aspiration to tend to several customer needs without going overboard with cost. As the construction industry grows, customers are becoming more and more demanding of better and uncommon designs of buildings and structures. Glass construction is relatively common in Tanzania today. Most buildings have glass walls and even roofs. But customers don't just want glass, they need it sandblasted, printed or laminated sometimes. If a company was to outsource glass related services such as sand blasting or lamination from other companies, the price would be extremely high due to the profit margin that would be added two times, by the provider of that particular service and the company itself. Vertical integration eliminates the problem of double profiting which allows companies to maintain lower prices while meeting diverse customer needs.

Guan and Rehme (2011) mentioned intensified competition as another driving factor to vertical integration. Increased competition comes with the growth of any industry and construction is not any different. The Tanzanian construction industry has continued to grow positively over the years as a consequence of the country's investments in building and infrastructure projects (Kikwasi and Escalante, 2018). This has attracted many people into the market. You can notice an obvious increase in the number of foreign construction companies in Tanzania, especially Chinese companies. This has intensified the competition in winning tenders especially for the locals due to their high prices which are caused by outsourcing and sub-contracting most of their services. In 2017 for example, two road upgrade contracts were awarded to four construction firms, all Chinese, namely Geo Engineering Group Cooperation, China Henan International Cooperation group, China Railway Seventh Group Company and China Wu Yi Company. Mind you this work was estimated to be worth USD 312.74 million. In any industry with intense competition, you have to provide services of a high quality while maintaining relatively lower prices to stand out, and vertical integration can do just that. Pitts (2004) stated that the ability to control inputs in the production chain can decrease defect rates and hence gain the firm a huge competitive advantage.

According to Al Sayegh (2010), the desire to improve quality could also lead to vertical integration. The issue of quality is very sensitive in the construction industry, especially in a growing one such as the Tanzanian. Davis and Pitts (2004) argue that when a firm has

the ability to manage input into the process can decrease defect rates and hence gain competitive advantage. When we talk about the concept of quality in construction it goes together with the concept of time, in the sense that if that product or service can be available on time. It is quite customary in China for contractors to vertically integrate into logistics firms to give themselves the ability to control movement of materials and the cost to move the materials.

Variability in input and output markets is another driving factor to vertical integration (Desai and Murkheji 2001). Input means something that is put in, taken in or operated on by any process or system to produce something else. In construction inputs are things put in or resources invested in accomplishing a task. Examples of construction inputs are building materials, time and money. Sometimes there's a massive volume of building materials in the market with no construction projects around, which forces the price of building materials to go down. Other times there is too many projects but not enough building materials, this gives the supplying firms leverage over the contractor and can choose to sell building materials at an insanely high price. Nayyar (1993) highlighted that this variation within the construction industry could drive a firm to vertically integrate as it realizes a market that is yet to be utilized by their counter parts. With vertical integration firms can utilize this market for lower costs to gain quick profits through synergy creation. This also gives a firm total control on production because the firm is aware of the number of projects they have and can estimate the volume of inputs needed and make sure it is available when needed. Vertical integration is a form of incorporation of various activities in the production chain to be done in house instead of outside (Eckard, 1984).

Al Sayegh (2010) also talked about how attractiveness of the industry can lead to a decision to vertically integrate. Market attractiveness include the extent to which a market offers opportunities to firms, taking into account the profitability, market size, growth rate and the level of competition. Whether a firm should or should not integrate and to what extent, it is all dictated by the attractiveness of the industry in which that firm operates in. The best time to integrate is when the industry is in the growth phase and getting profits is relatively easy.

Intangible resources, unique resources and core competence could make a firm want to vertically integrate (Khalil, 2010). It is well known that branding and reputation that precedes the company are vital in building a business. When a company has these, it can be encouraged to vertically integrate as it knows people already know the firm and it would be easy to trust it. For example, if a known contracting company was to start selling construction machinery like concrete compactors or stuff like scaffolding, it would be easy for people to trust them because they are already known in the market, Dar es Salaam glassworks Limited for example, which primarily deals with glass and aluminium construction now provides scaffolding service to other contractors in Tanzania. Nayyar (1993) argued that it would be more beneficial for the firm to vertically integrate if it owns special resources for instance, employees' knowledge skills and business training which can make profit. Core competence is necessary in the success of a firm because it is can result to competitive advantage if conveyed through unique resources. Nayyar (1993) further explains that other competitors will have a hard time imitating, if a contractor merges unique resources and core competencies in the application of vertical integration.

Additionally, Al Sayegh (2010) brought up surplus of tangible resources as another driving factor to vertical integration. Sometimes the driving factors to vertical integration are internal. A firm can be encouraged to integrate when there are idle tangible resources such as capital, machinery or labor. Instead of misusing excess profit a firm can choose to vertically integrated into another line of business in the same industry. Instead of these resources staying idle, it is better to use them into something else that can be beneficial to the firm.

Consider Table 2.1 below that summarizes the driving factors of vertical integration.

Table 2.1: Summary of driving factors for vertical integration

S/No	Driving factors	Author
i	The aspiration to tend to diverse customer needs without going overboard with cost	Cook and Garver, (2002)
ii	Desire for quality improvements	Al Sayegh, (2010)
iii	Intensified competition	Guan and Rehme, (2011)
iv	Variability in input and output markets	Desai and Murkheji, (2001)
v	Availability of intangible resources such as good reputation	Khalil, (2010)
vi	Core competence	Khalil, (2010)
vii	Attractiveness of the industry	Al Sayegh, (2010)
viii	Surplus of tangible resources	Al Sayegh, (2010)
ix	Bonding requirements	Krippaehne, (1992)

S/No	Driving factors	Author
x	Transaction costs	Schmelzle and Flesher (1991)
xi	Monopolized market	Schmelzle and Flesher (1991)

2.6 Benefits of vertical integration

As explained in chapter one section 1.1, vertical integration was adopted from the manufacturing industry in pursuit to solve some problems in construction. The benefits of vertical integration have been talked about by various authors such as Oyegoke et al, (2010), Lehtinen, (2010) and Guan and Jakob, (2012) as shown in Table 2.2 at the end of the section. Below are the benefits of vertical integration.

Singh et al. (2004) showed that almost 74% of quality related problems can be solved by adopting vertical integration. Every producer whether of a product or service, has a commitment to product quality. The fact that construction is a highly competitive industry only served to further emphasize the need for high quality products. But the construction process is a complex and multi phases process, it involves different people of different professions and organizations at various stages of the project. The final construction product is usually the work of many players which sometimes are not related at all. Disconnected systems present challenges and deficiencies that can compromise operational effectiveness. Khalfan et al. (2004) argued that in order to get a more effective and efficient performance from construction workers, you ought to integrate them into a team. Vertical integration strategy increases the involvement of a firm in the production chain within which it operates (Barney 1997). Increasing involvement in activities that supply the firm with inputs(backwards) for its operations means increasing its ability to control the inputs. Davis and Pitts (2004) stated the ability to control inputs in the production chain can decrease defect rates. Porter (1980) is in agreement with other writers because he highlighted that to increase innovation and gain quality control, firms ought to go for high degrees of vertical integration.

Lehtinen, (2010) brought up certainty of supplies of materials and services as another benefit of vertical integration. As explained by Pearce and Robinson (2010) Vertical integration is based on the accession of firms that used to provide the acquiring firm with either inputs or clients for its products. The fact that supply of inputs for production, such as building materials is done inhouse for vertically integrated firms, availability of

materials can be guaranteed. Also, this helps the firm to increase efficiency by streamlining the process of obtaining building materials, do the actual construction and possibly sell it themselves. If construction firms were to integrate into transportation services, the firm would make sure that there always would be transport available for its own building materials to be transported on time which can translate into finishing the projects on time.

Additionally, Lehtinen, (2010) argued that vertical integration leads to stability of operations. The construction industry is one of the most fragmented industries. The final construction product is usually the work of many players which sometimes are not related at all. The client, consultant, contractor, manufactures and suppliers of materials are some of the key players in the production chain. Fragmentation is inevitable in construction and is rooted in the nature of construction projects (Alashwal et al. 2011). This fact makes it difficult to have stable operations, but since vertical integration increases a company's involvement in the production chain within which it operates (Barney, 1997), it reduces fragmentation and makes operations a lot more stable.

Oyegoke et al, (2010) highlighted that vertical integration eliminates buildability issues during the execution of the project and in turn results to better time management. Vertical integration involves internalization of more than one stage in the production chain, good example is the design and build procurement system where the main contractor does both, designing and the actual construction. Since designing and building is done under the same roof, usually construction starts even before the designing is complete and these two stages go concurrently which allows for better time management and results to timely delivery of projects. The fact that once the contract is awarded the client only has to deal with the main contractor for both, the design and construction, it becomes easy for the client to engage with the contractor and their design team earlier in the design process to try and achieve a more practical and buildable design.

According Osegowitsch and Madhok, (2003), a firm can reduce the costs associated with transaction and agency challenges through vertical integration. Using an inhouse crew to do concrete work is an example of backward integration for construction firms, this would give the company better control of the prices to match the market in order to gain a bigger

market share. When companies vertically integrate, they gain the ability to control cost, which translates to lower prices and increased demand especially when the quality is also controlled which as mentioned before, comes with vertical integration as well. Transportation cost for example, can be reduced if common ownership results in closer geographic proximity (Clinton et al. 2008).

Lehtinen (2010) also stated that one of the advantages of vertical integration is the additional profit margins. Vertical integration involves internalizing production chain steps hence accumulating mark ups, the one that would be added by the firm and that which would be added by the other firm. Lehtinen (2010) argued that vertical integration gives the firm the luxury of charging low prices on final products through additional profit margins. Through integration of certain services, a construction firm can increase its profit share that would otherwise be given to subcontractors and other parties (Hammond 1984). This allows the firm to provide their services or products at relatively low prices because they can choose to remove one mark up to give themselves a competitive advantage which brings us to the next benefit of vertical integration.

Backward integration may allow a firm to obtain specialized input to improve or at least differentiate its final product (Olmos, Dejo, Rosell-Martinez 2016). Product differentiation is what makes your product or service stand out in the market. It's how you customize what you sell to make it different from what your competitors do. Increased control over adjacent phases may increase firm's ability to differentiate. Vertical integration provides opportunity to differentiate through increased ownership over inputs (Clinton et al. 2008).

Since vertical integration is a related diversification strategy which involve diversification into related markets, this ensures maximum utilization of resources such as human resource (Al Sayegh, 2010). Take an example the design and build construction method which is an example of vertical integration, the contractor might not necessarily need a different team of people to perform the designing, instead can use the same team of people since designing and construction teams consist of almost the same members. Unless there is too much work, the same people can be used hence maximizing productivity per person. Intangible assets such as core competence can easily be utilized in the next line of business since they are all related.

Other benefits include Synergy creation, increase capital and labor productivity, reduce construction delays, increase technological expertise and improve organizational performance (Al Sayegh, 2010). Also reduce marketing expenses, better inventory management (Lehtinen, 2010) and forming of entry barriers and economies of scale (Desai and Mukherji, 2001). Consider Table 2.2 below that summarizes the benefits of vertical integration.

Table 2.2: Summary of benefits of vertical integration

S/No	Benefits of vertical integration	Author
i	Better time management and buildability	Oyegoke et al, (2010)
ii	Quality control	Singh et al (2004), Khalfan, McDermott and Cooper (2004)
iii	Internalize markup	Lehtinen (2010)
iv	Cost control	Osegowitsch and Madhok (2003)
v	Product differentiation	Guan and Jakob, (2012)
vi	Certainty of supplies of materials and services	Lehtinen, (2010), Desai and Mukherji (2001)
vii	Stability of operations	Lehtinen, (2010)
viii	Increase capital and labor productivity	Al Sayegh, (2010)
ix	Creation of entry barriers	Desai and Mukherji (2001)
x	Synergy creation	Al Sayegh, (2010)
xi	Reduce construction delays	Al Sayegh, (2010)
xii	Economies of scale	Desai and Mukherji (2001)
xiii	Increase technological expertise	Al Sayegh, (2010)
xiv	Improve organizational performance	Al Sayegh, (2010)
xv	Reduce marketing expenses	Lehtinen, (2010).
xvi	Better inventory management	Lehtinen, (2010).
xvii	Eliminate contractual conflicts and claims	Oyegoke et al, (2010)

2.7 Challenges of vertical integration strategy

Like any other strategy, vertical integration is associated with a few challenges as summarized in Table 2.3 at the end of this section. It is important for construction managers to understand that vertical integration is associated with the following challenges.

Difficulty and complexities in coordinating activities (Al Sayegh, 2010). Coordinating the activities of one line of business on its own can be difficult, adding other lines of business just goes on to add on that. The firm might need extra or completely new set of human resource with additional skill set to help with the coordination otherwise it could result to

poor production due to poor coordination. Take an example of a contracting firm that has integrated into logistics, if they fail to coordinate their project schedule with delivery of materials it can lead to delays in construction and in turn lead to late completion of the projects.

Another problem associated with vertical integration is the need for high investments (Desai, Mukherji 2001). Any business cost money, so when a firm chooses to either extend its operations or buy a new business, they will need extra capital to buy the new business and keep it running. They might need to buy new equipment, hire more employees and sometimes even taking their managers to school to get an extra set of skills that is vital for running the new line of business because a manager that was good as a contracting manager overseeing construction, won't necessarily be a good manager of the sister company supplying building machinery. A company would need a very huge amount of capital to invest especially if acquisition is involved. Vertical integration can lead to fixed costs increase and may cause cash-flow problems during business cycle decline. The firm might also need to reinvest in the new technologies in order to avoid obsolescence and stay competitive.

Al Sayegh, (2010) argued that in a fully integrated system where a firm buys or sells all the inputs for production, such as raw materials internally and is associated with full ownership of the production facility, there is a risk of excess supply. Unlike taper vertical integration where firms depend on outsiders for some of their inputs and can also sell the excess.

Most managers don't really know how to identify the business unit synergies and other advantages of vertical integration, or how to avoid the risks of joining the firm with the wrong kind of make or-buy relationship (Robert, Bob and Jorge 1992). It is said that difference in economic and technological circumstances that exist in the various stages of a value chain, requires distinct management styles and cultures. Trying to manage the challenges that exist across successive businesses can be difficult to the management (Osegowitsch and Madhok, 2003). It is important for managers to understand that making adjustments within their vertical integration relationships to make sure they are not outdated is vital for survival of the firm. Harrigan (1986) argued that many firms have

either chosen the type of vertical integration that is not right for them or are integrated more than they needed. Although vertical integration has a lot of benefits, the key is timing and knowing the extent to which you should integrate at a given time. For vertical integration to work you need to determine the suitable degree of integration for at a time (Harrigan, 1983). For a smooth sailing of a firm which has vertically integrated, managers may need to develop new set of skills.

According to Desai and Mukherji (2001), vertical integration brings about loss of responsive flexibility to environmental changes. Construction is a very spontaneous industry characterized with erratic and recurrent demands, low profits and its competitors change tactics rapidly (Robert, Bob and Jorge 1992). In any volatile industry, where competitions must change tactics rapidly a high degree of vertical integration could reduce the firm's flexibility (Harrigan, 1983). Vertical integration reduces flexibility by forcing the firm to follow trends in the segments they integrated. If technology or market changes making the production methods or products of one line of business outdated, the firm may find it difficult to respond quickly. Take an example a contracting company that has acquired a cement building block making company, when the building blocks go out of fashion the firm might have to continue making them.

Additionally, Khalil (2010) argued that a concentric diversification such as vertical integration increases the risk to lose profit for the entire organization. Vertical integration can be defined as a type of personalization of various roles involved in the production chain to take place within the firm rather than outside the firm (Desai, Mukherji 2001). Harrington (1983) explains that vertical integration involves combining businesses in a way that outputs from one line of business can be used as inputs for another line of business. An example of vertical integration (backwards) is when the main contracting company purchases a construction machinery supply company to use in operations. This move could put the company in danger because it expands the scope of operation of the firm. Handling one business on its own is not easy, now combining two business lines which depend on each other in a volatile industry such as construction, is even riskier because when the industry shakes then both business lines will go down because they are related.

Other challenges associated with vertical integration include the problem of unclear scopes and design changes that is associated with design and build procurement system Oyegoke et al, (2010). Consider Table 2.3 below that summarizes the challenges of vertical integration.

Table 2.3: Summary of challenges of vertical integration

S/No	Challenges associated with the application of vertical integration	Author
i	Increase in business risk	Khalil, (2010)
ii	Unclear work scopes	Oyegoke et al, (2010)
iii	Incompetence in the management	Osegowitsch and Madhok (2003)
iv	Need for high investments	Desai and Mukherji (2001),
v	Design changes	Oyegoke et al, (2010)
vi	Reduction of strategic flexibility	Desai, Mukherji (2001)
vii	Excess supply of materials	Al Sayegh, (2010)
viii	Difficulty and complexities in coordinating activities	Oyegoke et al, (2010), Al Sayegh, (2010)
ix	Project interface problems with the environment	Chritamara and Ogunlana (2001)

2.8 Current status of vertical integration in the Tanzania construction industry

Vertical integration is fairly a new concept in the construction industry as compared to other industries such as the manufacturing industry. Examples of companies that have seen great success through vertical integration in other industries in Tanzania include Mohamed Enterprises Ltd (MELT) and Bakhresa group of companies (Absanto and Nnko, 2013). There is barely any literature on vertical integration in the Tanzanian construction industry and that is the gap that this research aimed to fill.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Zikmund et al (2010) defines research methodology as a section which explains the fitting technical steps for the research through describing the research design and sampling design adopted for the research, collection of data and investigation performed for the study. Research methodology is the research's guiding idea or overall code Dawson (2013).

This chapter discusses the methods selected by the researcher in pursuit to solve the research problem and answering research questions while giving reasons to why a specific strategy or methods was chosen. It will consist of research design, research population, sampling technique and design, case selection and data collection, analysis, and interpretation.

3.2 Research Approach

Yin (2003) defined research approach as a systematic and reasonable procedure for getting a solution to a problem through facts. There are two types of research approaches namely qualitative and quantitative (Fellows and Liu, 2003). The research approach that was used for this study is qualitative research approach because the researcher aimed to assess facts and opinions from the field so as to generate new ideas to solve the research problem. The objective of a qualitative research is to find the fundamental reasons to why things are the way they are using in depth interviews (Kothari, 2004).

3.3 Research Design

Cooper and Schindler (2013) defined research design as a map and anatomy of investigation formulated to answer research questions. It consists of a structure of what the researcher plans to do from writing hypotheses and their operational implications to data analysis. In other words, research design is a framework through which research is conducted. It translates research problems into data for analysis to provide answers to research questions. There are different kinds of research designs, contingent on the aim of the research (Creswell, 2004).

The research design that was employed for the purpose of this research is a case study design. Yin (2018) defined a case study as a factual technique that looks into current circumstance comprehensively and thoroughly and within its natural environment, particularly when there is no clear distinction between the circumstance and environment. Reason to why the researcher chose a case study design is because the research is about a contemporary issue, no control was needed over the research subject. Case study research is main goal is understanding a situation in its natural environment over which the investigator has no authority (Yin 2003). Also, according to Eliufoo (2005) research about contemporary issues favor the use of case studies. Figure 3.1 below illustrates the research design of the research.

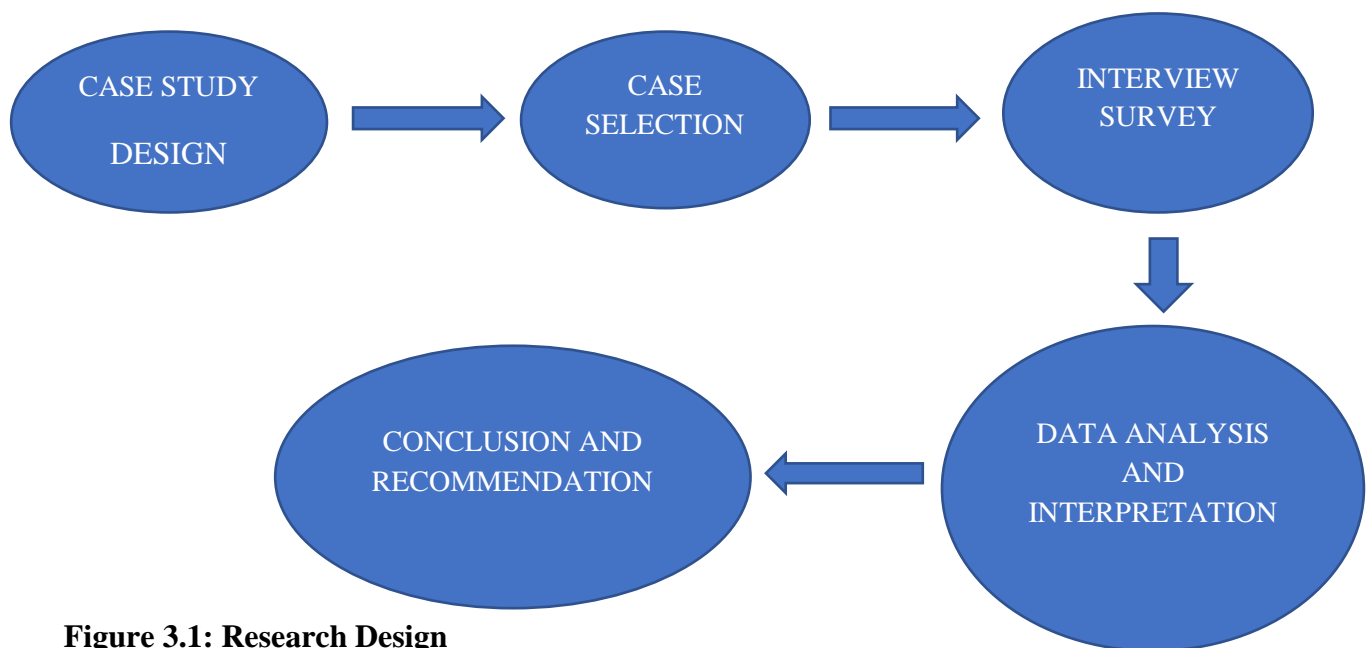


Figure 3.1: Research Design

3.4 Sampling Technique

Kothari (2009) defined sampling design as techniques or procedures that will be adopted by the researcher in selecting items for samples. There are two types of sampling techniques that are probability sampling and non-probability sampling. Probability sampling is known as random sampling, where under this method every item in the universe has an equal chance of being selected unlike nonprobability sampling (Kothari, 2009, Cooper and Schindler, 2013).

This study adopted a two-stage sampling technique where the first sampling stage involved the selection of case studies. Snowball sampling was used where the first firm was asked

to direct the researcher to other vertically integrated construction firms. The reason to this sampling technique was because vertical integration is not common in Tanzania, only a few contractors are vertically integrated. Naderifar, Goli, Ghaljaei (2017) explain that snowball is used when it is not easy to access subjects with the needed characteristics, so the available subject recommends future subjects among their peers.

The second stage involved the selection of respondents within the case studies, judgement nonprobability sampling was used. This was because of the nature of research subject and research questions. Only members that are involved in decision making of the company were interviewed. Figure 3.2 below illustrates the two stages that were used for sampling.

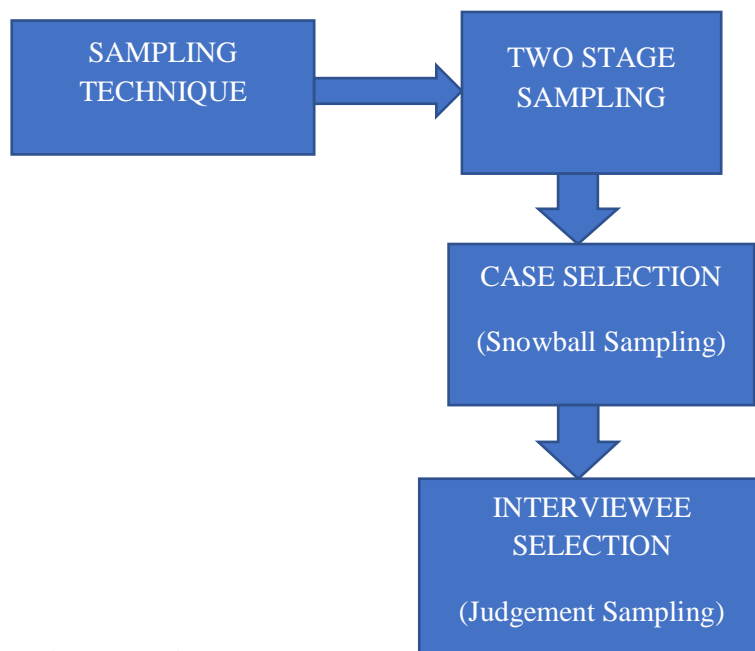


Figure 3.2: Sampling technique

3.5 Case Selection

Three construction firms, Group Six International Limited, Dar es Salaam Glass Works and Advent Construction Limited were selected as case studies. The reason for selection of these three firms was because they were information rich. Information-rich cases are those from which a researcher can understand a great deal concerning issues which are most important to the purpose of the research, hence the term purposeful sampling (Patton, 2002). According to Yin (2018) it is advised to use two or multiple cases as it is more substantial compared to when you use one case, that is the probability of doing a good case study increases with the number of cases.

Stake (2006) pointed out that the importance of using more than two cases is that it allows for examination of how a phenomenon behaves in different settings. Additionally, the researcher selected three cases because vertical integration is not very common in Tanzania, only a few firms are vertically integrated.

3.6 Data Collection

It is a process that involves congregating and measuring information on the subject matter in a way that one can get the answers to their research questions, test hypothesis and evaluate the results (Kabir, 2016). Different methods are used for different research types, but the important thing is to make sure the collection is honest and accurate. Data collection is very crucial for any research as it's from it, that we can get evidence that could later, be analyzed to get trusted findings to the research questions.

3.6.1 Data Collection tools

According to Kabir (2016) there are different data collection tools, including questionnaire, interviews, focus group discussions and observation, just to mention a few. The research questions dictate the selection of data collection tool or tools (Huma and Nayeem, 2017). The researcher selected Interview guide as a data collection tool for this study because of its advantages as listed below.

- i. Ability to capture real emotions and behaviors. You can't capture this using questionnaires or online quizzes.
- ii. Keep focus. The interviewer can control the interview and help the interviewee stay focused which helps with quick data completion unlike questionnaires where respondents fill it in their convenience and usually with no focus.
- iii. Flexibility. The interviewer can ask probing questions depending on how interviewees answer questions to exhaust as much information as possible from them.
- iv. High response rate. Usually, the interviews are set to take place at a place and time which is convenient for interviewee which leads to a high response rate
- v. Generates rich/in-depth information. This relates to the first point that talked about capturing real emotions and behaviors.

Therefore, a total number of 15 people were interviewed. While the sample of 15 interviewees might be considered as small, according to Patton (2002), the threshold of between five and 50 interviews can be enough to reach saturation. Hence, the sample size is considered adequate. The interview guide of this research involved two-parts part A and B. Part A carried personal information questions and part B questions developed to address specific objectives, for more details about interview guide see appendix 1.

3.7 Data Analysis and Interpretation

Basically, data analysis involves translation of raw data into valuable information. Boeije (2010) talked about the importance of managing raw data carefully, to facilitate easy analysis. Data analysis is done so data can be converted into information that can help to answer research questions and make conclusion and recommendations.

Content analysis method was used for analysis of data collected through interview survey. According to Krippendorff (2004) it is used to make valid conclusions from texts or other meaningful data. It was chosen as a data analysis method because it allows the researcher to recover and examine the fine distinction of organizational behavior which will be valuable for the study.

3.8 Validity and Reliability

Reliability is a concept found mainly in quantitative research, but the idea is used in all kinds of research (Golafshani, 2003). According to Yin (1994), to measure the quality of a research design one ought to check its internal validity, external validity, and reliability. Internal validity is obtained when the conclusion about the connection of more than one variable is sound and reasonable (Bryman, 2006). External validity is about whether the research findings can be generalized outside the context of that particular research (*Ibid*). And finally, if steps of the research such as data collection can be repeated without changing the final results, then it is reliable.

Phil (2021) talks about triangulation as one of the methods that can be used to guarantee validity of a research. Triangulation is described as the use multiple theories, data sources or investigators within the study of a single phenomenon. In pursuit to make sure the research is valid and reliable the researcher sent the interview guide to four lecturers at the

university including the research supervisor to check for the relevance of interview questions in answering research questions and make corrections were needed. Three firms were picked for the case study and in each firm the researcher interviewed as many participants as possible considering their availability. Validity and reliability of a research can be judged within the realism paradigm which relies on multiple perception about a single reality Healy and Perry (2000). Lastly after data analysis and interpretation was done, it was sent to the research supervisor and one colleague to check, in effort to account for personal biases.

Mears (2017) encourages the use of mechanical recording of data rather than researcher notes during interviews to ensure validity. The researcher used a smart phone to record audios during all interviews with consent from interviewees.

CHAPTER FOUR

DATA ANALYSIS

4.1 Introduction

This chapter analyses the data collected from the field by making intensive discussion through content analysis method for reasons explained in chapter three, section 3.7 and then interpret it into valuable information on the basis of the main objective of the research which is to assess the application of vertical integration in the Tanzanian construction industry as mentioned in chapter one. In this chapter each independent specific object was analyzed separately in connection to the main objective of the research.

4.2 Case Study selected

A total of three case studies were selected including Group Six International Limited, Dar es Salaam Glass Works, and Advent Construction Limited. The key reasons for selection of these cases have been clearly explained in chapter three section 3.5. The next section will explain the background of each case.

4.2.1 Case One – Group Six International Limited.

Group Six International Limited (GSI) is contracting company in Tanzania found back in 2006 and registered with Contractors Registration Board (CRB) as class one Building and Civil Contractor. The major business scope of Group Six International Limited is to concentrate on all kinds of construction, especially building and civil works. But other than the actual construction, the company is involved with survey, supply of equipment, building materials, real estate development, maintenance, technical consulting, labor service and installation of sanitary appliances and pipes through a sister company named **Lesso**. Group Six adopted a vertically integrated structure due to various reasons that will be discussed later in this chapter. The company has a registered capital of Tshs1,000,000,000 which is equivalent to USD 434,000 and has over 100 members of staff including experienced engineers, architects, quantity surveyors, technicians as well as other professionals. The company is well equipped with all necessary construction equipment, plant, tools, scaffolding, light and heavy trucks. Since its establishment the company has undertaken numerous projects in Tanzania, including commercial buildings, residential houses, schools, hotels etc.

4.2.2 Case two – Dar es Salaam Glass Works Limited

Dar es Salaam Glass Works Limited is a local class one contracting company registered in 2001 under the contractor's registration board (CRB) as a specialist mechanical type of a contractor. It has over 40 years of experience starting back in 1979 as a family owned and run business. They mainly specialize in structural glazing and aluminum works, working on many of the country's most iconic buildings. After being in the industry for so long Dar es Salaam Glass works saw an opportunity to integrate other construction related activities into the company in pursuit to grow as a company and gain a competitive advantage as the industry was getting more and more competitive with time. Some of these activities include, supplying of glass, aluminum, and other structural glazing components, renting of cradles and scaffolding, logistics and transportation of materials, research and development, project financing, structural and interior designing, operation and management of properties, marketing and sales of properties and maintenance and repair.

4.2.3 Case Three – Advent construction Limited

Advent Construction Ltd is one of Tanzania's biggest and most reputable construction companies registered under the Contractors Registration Board (CRB) as a class one Local Civil Contractor. With more than 1000 employees, their projects are spread all over the country from civil to major and medium scale building works. Aside their primary role as a main contractor, they have boundless experience in designing and using value engineering to cater to their clients' needs. It has also handled turnkey factory projects through its vertically integrated structure and sub-contractors. Other construction related activities that Advent contractors deal with include Manufacturing of construction blocks (concrete, hollow and paving), premixed concrete, Manufacturing of all wooden works, doors and cabinets, Metal works (Gates and other steel structures), Plumbing works and Aluminum fabrication which they have currently stopped.

4.3 Profile of case organizations

As explained in chapter 2 section 2.2.1 and 2.2.2 about forward and backwards integration where Forward integration happens when a company progresses towards the end user in the production chain and backward vertical integration happens when a firm involves itself with activities preceding it in the production chain (Adeleke, et al., 2019). The survey revealed that Group Six International which deals with supply of construction equipment,

building materials, real estate development, maintenance, and technical consulting among other things, has been vertically integrated both ways, forward and backward for around 7 years.

The study showed that Dar es Salaam Glass works Limited is also integrated both ways for over 20 years into supply of materials, real estate, logistics and transportation of materials and machinery, to mention a few.

However, research findings disclosed that Advent Construction Limited is only integrated backwards mainly into supply of ready mixed concrete and construction blocks for almost ten years. Below is Table 4.1 showing the profile of case organizations.

Table 4.1: Profile of case organizations

Case	Name of the company	Experience with vertical integration (Years)	Type of vertical integration
1	Group Six International Limited.	7	Forward and backwards
2	Dar es Salaam Glass works Limited.	25	Forward and backwards
3	Advent Construction Limited (Tanzania).	10	Backwards

As shown in table 4.1 above all companies had more than 5 years of experience with vertical integration, including one which had more than 20 years of experience. This implies that data was collected from companies with enough experience with vertical integration which may increase the reliability of the data collected.

4.4 Profile of case organizations respondents

Interview survey was used to collect data for the reason vertical integration is not very common in Tanzania within the construction industry. This method allowed the researcher to exhaust as much information as possible from the respondents from the three case companies that were studied. Because of the nature of the interview questions, not every member of the company qualified to be a respondent, therefore only management level personnel and any member of the company that is involved in decision making qualified to be respondents (This is explained in depth in chapter three, section 3.4). The profiles of interview respondents are shown in Table 4.2 below.

Table 4.2: Profile of Interviewees

Case	Interviewee	Designation	Experience in construction industry (Years)	Name of the company
Case 1	A	Deputy general Manager	6-10	Group Six International Limited.
	B	Engineering Department Manager.	11-15	Group Six International Limited.
	C	Project Manager	6-10	Group Six International Limited.
	D	General Manager	16-20	Group Six International Limited.
	E	Finance department manager	11-15	Group Six International Limited.
Case 2	F	Financial Manager	11-15	Dar es Salaam Glass works Limited.
	G	Chief Executive officer	6-10	Dar es Salaam Glass works Limited.
	H	Project coordinator.	>20	Dar es Salaam Glass works Limited.
	I	Managing Director	0-5	Dar es Salaam Glass works Limited.
	J	Chairperson board of directors	>20	Dar es Salaam Glass works Limited.
	K	Senior quantity Surveyor	6-10	Dar es Salaam Glass works Limited.
Case 3	L	Manager of the Tendering and Estimation department.	6-10	Advent Construction Limited (Tanzania).
	M	Senior project manager	16-20	Advent Construction Limited (Tanzania).
	N	Managing Director	16-20	Advent Construction Limited (Tanzania).
	O	Financial advisor	6-10	Advent Construction Limited (Tanzania).

From table 4.2, a total of 15 people were interviewed from the three case companies. Generally, 8 out of 15 people who were interviewed, which is equal to 53.3% had more than 10 years of working experience in the construction industry which suggests that data was collected from well experienced respondents which can justify the validity of the data.

4.5 Findings

4.5.1 Driving Factors of Vertical integration

According to Fawcett (2008) the driving factors for vertical integration can be divided into two groups, first the external influence and second the probable benefit of the strategy. In order to address specific objective number one, which is to identify the driving factors of vertical integration to contracting firms in Tanzania, interviewees were asked the question

“what are the driving factors that motivated their company to diversify into other construction related activities?”. Table 4.3 summarizes and reports on the driving factors for vertical integration to Tanzanian construction firms as explained by the interviewees.

Table 4.3: Summary of Interview responses on the driving factors for vertical integration to Tanzanian construction firms

No	Driving Factors for vertical integration	Interviewees															Total Count
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
1	Desire for quality improvements	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓		✓		11
2	Clients	✓	✓	✓	✓	✓				✓	✓			✓	✓		9
3	Competition	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓		11
4	Familiarity and Core competence	✓	✓	✓		✓	✓			✓	✓			✓		✓	9
5	Market availability			✓			✓	✓		✓						✓	5
6	Business expansion	✓		✓				✓							✓		4
7	Financial pressures	✓															1
8	Improved profitability	✓											✓			✓	3
9	Need to protect core business secrets	✓															1
10	Unavailability of materials		✓										✓	✓			3
11	Idle labor and equipment		✓			✓				✓	✓						4
12	Company’s good reputation							✓		✓	✓						3
13	Buildability challenges									✓							1
14	Company’s vision to grow										✓	✓			✓		3
15	Availability of capital											✓					1
16	Cost advantages												✓			✓	2
17	Contractual conflicts													✓			1
18	Technological interdependencies														✓		1

Legend/Key

- Case 1
- Case 2
- Case 3

From the responses as summarized by tables 4.3, we can see that the most mentioned driving factors of vertical integration in the Tanzanian construction industry are the ‘need for quality improvements’, ‘Clients’, ‘Increased competition’, ‘Core competence’ and ‘Market availability’. These responses were tallied based on how many interviewees out of all 15 interviewees mentioned that particular factor. The factors that were mentioned by only one interviewee among fifteen was considered to be less significant.

4.5.1.1 Quality

We can observe that one of the main driving factors to vertical integration was their need to improve quality of their works and the Tanzanian construction industry in general as it was repeated by almost all participants. Interviewee A was quoted saying,

“Quality is the main factor in the construction Industry, if you construct a building of a good quality you can go even for 20 years without needing to do renovation. We realized we could provide a more quality concrete with better strength if we produce it ourselves, that’s how the idea of making ready mixed concrete with a batching plant came about. In the batching plant everything is computerized which makes it precise and perfect. We supply concrete for ourselves and other contractors, and although the ready mixed concrete is expensive as compared to the concrete you mix at site but our priority is quality.”

Interviewee E simply put it this way *“Also, to maintain the quality, when you do these things in house, you get to maintain the quality as per the standards you set for yourself and control the cost giving yourself a competitive advantage through better pricing.”*

This factor has been mentioned in other literatures as well such as Al Sayegh (2010) and Davis and Pitts (2004) and Singh et al (2004).

4.5.1.2 Competition

Another factor that was mentioned by most interviewees was increased competition within the industry. The Tanzanian construction industry has continued to grow positively over the years as a consequence of the country's investments in building and infrastructure projects (Kikwasi and Escalante, 2018), Muhegi and Malongo (2004) put numbers into that statement by stating that the industry has seen steady growth from 8.7% in 2001, to 11% in 2002 and 15% in 2003. For a company like Dar es Salaam Glass works has been in business for over 40 years, they have seen the Tanzanian construction industry grow and change to be what it is today. It is almost like vertical integration was a natural strategy for Dar es Salaam Glassworks Limited as a result of changes that happened in the industry with time. This is what interviewee J had to say,

“With time the construction industry kept on getting more and more competitive, it became harder to win tenders so we had to find a way that could reduce cost so as to give us a competitive advantage.”

Guan and Rehme (2011) and McDougall and Round (1984) seem to be in agreement with this fact. They argued that usually, the increase in competition forces firms to integrate.

4.5.1.3 Clients

Another common driving factor for integration noted from table 4.3 are the clients. Most respondents mentioned how the company's need to satisfy several clients' needs led them to vertical integration. Cook and Garver (2002) also spoke on the fact that integration can be sparked by the desire to satisfy diverse customer needs while maintaining lower costs. This short explanation interviewee by B made a lot of sense.

“Material suppliers can be a headache you don't want to depend on them to deliver on time because that's how you are going to get in trouble with the client. We had to ask ourselves why do we have problems with our clients over something that we can do ourselves in a timely manner? Basically, that's how the idea of starting to supply glass for ourselves and other contractors started.”

4.5.1.4 Familiarity and Core competence




Many interviewees pointed out the fact that vertical integration was a result of them being familiar with the construction industry and having that core competence that allowed them to navigate easily through other construction related lines of business. Interviewee O responded that,

“We are quite competent in the construction industry, our reputation as contractors precedes us. So, for us it is easier to expand our business in the same industry that we are familiar with and because of the core competence, we did not need a lot of new employees, mostly we just had to train the employees we already had which made it a lot easier.”

Al Sayegh (2010) divided the motives to vertical integration into four groups namely, industrial, internal, financial, and quality. Core competence has been grouped as an internal motive to vertically integrate. He highlighted that core competence is an important factor in the smooth operation of a vertical integration strategy because it involves the use of already available abilities, skills, and expertise.

No	Benefits of vertical integration	Interviewees															Total Count	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O		
20	Increase market knowledge									✓								1
21	Increase market control									✓								1
22	Competitive advantage during tendering due to low rates					✓				✓			✓					3
24	Improve production chain coordination										✓			✓				2
25	Synergy creation																✓	1

Legend/Key

	Case 1
	Case 2
	Case 3

From the above responses the benefits that were mentioned by most respondents are cost control that leads to economies of scale, quality assurance, internalization of profit that would otherwise be shared with other people, stability of operations, certainty of material supply, increase in technological know-how, decrease of buildability issues, creation of entry barriers to competitors, reduce construction delays and increase labor productivity.

4.5.2.1 Cost control

Cost control refers to the process of managing and controlling factors that can alter the budget of a particular activity (Owens et al 2007). Faremi, Ogunsanmi and Iniobong (2019) explained that cost is a very important factor in determining the success of a construction project. 12 respondents out of 15 who were interviewed mentioned cost control as a benefit of vertical integration. Respondents argued that when you do most of the works in house you can control cost because you remove the middleman costs and additional markups that you would otherwise be charged. Osegowitsch and Madhok (2003) stated that through vertical integration a firm can reduce the costs associated with transaction and agency challenges. This was emphasized by interviewee I who said that:

“We have managed to reduce the cost of production by almost 20% roughly since we bought our own batching plant. Usually, the ready mixed concrete is more expensive than the concrete you make at site, so imagine having to purchase it every time you need it from a supplier who is obviously adding profit

for themselves. Even worse when there is so many projects going around because suppliers know the demand is high, the prices can go very high.”

4.5.2.2 Quality assurance

Quality is another factor in determining if a construction project was successful or not (Wanberg et al, 2013, Romeo et al 2014). Other factors include cost and time. The advantages of higher customer satisfaction, better quality and increase in market share are all a result of adoption of vertical integration by construction companies (Pheng and Teo, 2004). This has been proven to be true even in the Tanzanian construction industry. 9 out of 15 respondents talked about how vertical integration has helped them maintain quality of their construction projects. Interviewee K was quote saying,

“The importance of vertical integration in maintain quality of the works cannot be overstated. Through controlling the quality of inputs, you can control the quality of the output. We make our own blocks, from concrete to hollow. Through controlling the quality of the blocks that we produce we control quality of our buildings.”

Other literatures that support this claim include, Singh et al (2004) and Khalfan, McDermott and Cooper (2004).

4.5.2.3 Internalize profit

Lehtinen (2010) stated that one of the advantages of vertical integration is the additional profit margins. Respondents seem to agree with the literature as 6 out of 15 who were interviewed mentioned internalization of profit as one of the benefits of vertical integration. Interviewee G summarized this point very well by saying,

“Instead of paying up another company to do something for you, you do it yourself and get to add to your profit. We do all of our plumbing works here, that way nobody is overcharging us, and we get to keep all the profit.”

This perspective is similar to Hammond (1984) who said that, through vertical integration construction firms gets to keep all their profit instead of sharing it with subcontractors and other parties.

Another respondent, interviewee N explained this from a business point of view, he highlighted that:

“Construction is a business like any other business, the aim is to get as much profit as possible. As one of the big building construction companies in

Tanzania, truth is we do get projects, so we use to pay our suppliers a lot of money to order and deliver materials for us. Imagine having to pay them every time we got a project. That is a lot of money lost that we now get to keep.”

4.5.2.4 Certainty of material supply

Availability of materials can affect the completion of the project (Subramani and Prabhu, 2018). For any construction project to go smoothly, there must be a dependable supply of building materials that can supply materials of a good quality, on time and at a good price. According to Pearce and Robinson (2010) Vertical integration involves the acquisition of firms that supply the acquiring firm with inputs for its final products. The fact that supply of inputs for production, such as building materials is done inhouse for vertically integrated firms, availability of materials can be guaranteed. 6 out of 15 respondents who were interviewed agree with these literatures. Interviewees L and F gave the following comments,

“When you take over supply of materials as a contractor there is an assurance of material availability for your projects. You know how many projects you have, when they are going to start and how much material will be needed. This helps in knowing when to order which materials and in what quantity so that they can arrive on time. The thing with construction projects is every step depends on the previous step, if there is a delay in material delivery, chance is there is going to be a delay in completion of the project and that is a problem”

“I remember when we first started the company about 40 years ago, I never liked having to depend on suppliers because you can’t really depend on them. You are not their only client so sometimes the highest bidder wins, especially during the times where there is a high demand of a particular material. The goal was always to integrate to remove this dependency and giving ourselves assurance on the availability of materials.”

Other literatures that emphasize this point include Lehtinen, (2010) and Desai and Mukherji (2001).

4.5.2.5 Reduce buildability issues during construction

Wang et al (2001) condemns the traditional method of procurement where contractors are not involved in the design stage to be the cause of buildability issues which in turn leads to

reduced productivity. Design and build is a typical example of vertical integration where both designing and the actual construction is done under the same roof. CIRC, (2001) emphasizes that considerations made during the outset of the project are very necessary to avoid buildability difficulties during execution of the project. Interviewee B from a company that used to do construction only but now have integrated into designing agrees with the literature and in his own words put it this way,

“We started designing as a means of reducing buildability issues because most architects would design structures that were not realistic in the field and with the technology available in our country. We would always have to change architectural drawings after we received them which would cost us so much time and lead to construction delays.”

In connection to the issue of buildability, interviewee M talked about how the design and build method encourages innovation in construction. I quote,

“Unlike the traditional method, design and build method motivates the company to consider approaches which are more innovative and can attain value for money. The fact that both the design and construction team work together from the beginning in effort to address issues that may probably come in the future is what makes innovation possible. In turn it reduces the risk of design errors which can cost money and time to rectify. There’s also the issue of site conditions, when the contractor is also the designer, the design can be customized in a way to suit adverse site conditions before the actual construction starts”.

Oyegoke et al, (2010) agrees with the respondents on the fact that vertical integration through design and build procurement can reduce buildability problems during construction projects execution.


4.5.3 Challenges associated with vertical integration.

In trying to address the third specific objective of the research which is to assess the challenges of vertical integration strategy in relation to the construction industry, the respondents were asked about the challenges that their companies face as a result of adopting vertical integration. The question was “What are the challenges that your company has faced as a result of this diversification?” Table 4.4 below summarizes the responses.

Table 4.5: Summary of Interview responses on the challenges of vertical integration to Tanzanian construction firms

No	Challenges of vertical integration	Interviewees														Total Count	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N		O
1	Nature of contracts	✓		✓	✓	✓	✓						✓	✓	✓	✓	8
2	Need for high investments	✓			✓	✓		✓	✓	✓		✓					7
3	Lack of support from the government	✓		✓	✓		✓					✓			✓	✓	7
4	Increased business risk	✓			✓				✓			✓	✓			✓	6
5	Decrease strategic flexibility	✓	✓		✓	✓			✓		✓	✓					7
6	Failure of the main business	✓							✓			✓			✓		4
7	Design changes	✓									✓						2
8	Surplus of materials	✓								✓	✓		✓				4
9	Abrupt technological changes		✓						✓			✓			✓	✓	4
10	Need for supervision to ensure quality		✓														1
11	Decrease flow of knowledge from outside the firm					✓							✓				2
12	Management bureaucracy						✓		✓			✓	✓				4
13	Lack of specialization							✓				✓		✓	✓		4
14	High exit barriers							✓									1

Legend/Key

	Case 1
	Case 2
	Case 3

From the Interview responses, the challenges that most vertically integrated construction firms in Tanzania come across are the nature of contracts, need for high investments, lack of support from the government, increase in business risk, reduced strategic flexibility and failure of the main business due to loss of focus and lack of specialization.

4.5.3.1 Nature of contracts

The respondents have claimed that this is one of the challenges that they face as contractors who have integrated into designing to work under design and build. When there are a few design and build contracts it's loss for them who have invested a lot of capital to make the system work. Interviewee M was caught saying,

“There is no point of having the designing department under the same company if most contracts are traditional. That was our biggest challenge, it was discouraging to integrate into designing back in the days even if that was your vision as a company. But the industry has changed so much with time, there is hope for the vertically integrated firms.”

Interview F further explained that,

“The industry has changed so much compared to the past it was very discouraging to tap into designing as well because most projects were under the traditional method, but we are looking for it to change even more to make design and build the most dominant system, that is the only way to encourage contractors to integrate into designing.”

According to Kamala (2000) the traditional building procurement system is more common in Tanzania compared to the design and build. According to a survey conducted, he showed that in the in the past only 3.6% of the projects were done under design and build as compared to 91% which were under traditional method, and less than 5% for other methods such as management contracting and construction management. The survey showed a great change from 3.6% to 16% for the design in build system and a drop in traditional method from 91% to 38%. This is to show although there has been an improvement, the traditional method is still more common in the Tanzanian construction industry.

4.5.3.2 High investments

7 out of 15 members that were interviewed seemed to be in an agreement with the researcher. From the responses it looks like capital investment is necessary for a vertical integration system to work. The respondents claim that although in a long run vertical integration will reduce production cost you need capital to make the system work. Interviewee G put it this way,

“At first it was not easy because for you to prosper in anything new you need to have good infrastructure, resources, and manpower. You might want to integrate but sometimes the funds are just not enough to make the system work. We bought a batching plant about 8 years ago although we wanted to make our own concrete way before that, but we had to wait until we had enough capital. And although a lot of investment is required, sometimes you start something thinking it is going to benefit you in a certain way and then it doesn't, but you learn from it. It's not everything you choose to diversify on will work all the time. For us it happened with aluminum works, we realized it needs a lot of attention and technical knowledge that becomes hard for us to provide in big projects.”

This challenge has also been mentioned by Desai and Mukherji (2001).

4.5.3.3 Lack of support from the government

This was one of the challenges that was commonly mentioned by a some of the members although it has not been written about by most literature. It seems to be common problem in Tanzania. The respondents linked this challenge to the fact that most of government projects are in traditional procurement system. Although it was obvious from the responses that in the past five years the situation changed for the better as compared to before, as methods such as design and build method and turnkey which support vertical integration became more popular. Here is what one of the respondents (Interviewee N), who was very passionate about the importance of government support had to say,

“But mainly for vertical integration to work, there must be projects that allow for it, and this is entirely up to the clients, mainly the government. For example, in a turnkey project, a vertically integrated construction company would prosper”

This challenge has not been mentioned by other literatures, so it looks like it's mainly faced by Tanzanian construction firms and probably other developing countries.

4.5.3.4 Increased business risk

Another challenge that Tanzanian construction firms face due to vertical integration is increased business risk. This challenge is common across industries, Khalil (2010) said when a firm diversifies into related markets it risks losing profit for the entire organization. He explained the reason to be because in a vertical integration, activities depend on each

other in a way that if one fails, you risk the failure of the whole chain. From the interview responses the case seems to be the same in construction in Tanzania. For example, Interviewee C had this to say,

“Construction is a very spontaneous industry, to be a competitive player you need to have the ability to change rapidly with the industry, a high degree of vertical integration could reduce the ability of a firm to change rapidly and hence increase risk of failure. It is very risky for the company when a backward integration fails because other activities depend on it.”

Some respondents linked this challenge to another challenge of lack of specialization and loss of focus from the main business which in this case would be the actual construction. Respondents suggested that loss of focus from the main business that comes with having multiple lines can increase risk of failure. Interviewee L from a company that vertically integrated into aluminum works but later had to stop elaborated it very well by saying,

“For us it happened with aluminum works, we realized it needed a lot of attention and technical knowledge that was hard for us to provide in big projects without compromising on the general construction works, especially in terms of timely delivery. We later stopped doing aluminum works.”

4.5.4 Strategies to address challenges associated with vertical integration.

To address the fourth specific objective of the research which is to propose the best ways that Tanzanian contractors can use to guarantee a smooth operating vertically integrated system and maximize its benefits, the respondents were asked about the strategies they use to counteract the challenges associated with vertical integration. Respondents were asked the question “Which strategies do you use or plan to use to address the challenges and maximize the benefits of the diversification? Table 4.5 below summarizes the responses.

Table 4.6: Summary of Interview responses on the strategies to address challenges of vertical integration to Tanzanian construction firms

No	Strategies	Interviewees														Total Count	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N		O
1	Market analysis	✓				✓	✓						✓	✓	✓	✓	8
2	Avoid using full vertical integration	✓		✓			✓	✓					✓				4
3	Use in house supervisors						✓					✓	✓		✓		4
4	Employing new managers that fit	✓			✓				✓	✓		✓	✓	✓		✓	8
5	The use of dept equity	✓	✓			✓			✓								4
6	Adjust to different degree of vertical integration	✓		✓		✓	✓							✓	✓	✓	7
7	Maintaining the balance of productive capacities	✓		✓					✓		✓		✓	✓			6
8	Inside competition	✓							✓				✓				3
9	Monitoring of technical environment		✓						✓			✓			✓	✓	5
10	Pleading with the government for policy changes		✓	✓													2

Legend/Key

	Case 1
	Case 2
	Case 3

From the Interview responses, the strategies which were mentioned by most respondents are market analysis, adjust to different degree of vertical integration, employing new managers and maintaining the balance of productive capacities. These strategies are further explained in the subsections below.

4.5.4.1 Market analysis

Most respondents mentioned market analysis to be an important step before the company decides to vertically integrate. Interviewee O said,

“For any vertically integrated firm to excel, there is a need to know exactly what is first compatible with the old business, and secondly what is marketable so as to generate quick profits”. Interviewee O went on to say that the decision to buy a batching plant was a result of market analysis, they noticed a need for a premixed concrete within their company and outside.

Interviewee C was in agreement with interviewee O on the importance of market analysis, he said *“When the company decides to expand through vertical integration strategy, it is almost like they are starting a new business except it is*

related to the old one. Market analysis is very important to know exactly what to venture in, because this will determine your profit going forward and the survival of your main business as well.”

The same concept has been discussed in other literatures as well, Lehtinen (2010) argued that the lack of market analysis before the decision to integrate, especially in a spontaneous industry such as construction, can be a great disadvantage down the lane.

4.5.4.2 Employ new Managers.

8 out of 15 members that were interviewed emphasized on the importance of employing new managers when a construction company ventures into a related market. The danger of assuming that the old manager can handle all lines of business simply because they are related was explained very well Interviewee A who said,

“You can’t just assume your old manager will be able to handle the new venture the same as the old one, for example when we first ventured into plumbing through our sister company, we made a mistake of having it all handled by our general manager not knowing different lines of business, even in construction, might require different expertise”.

Krippaehne et al. (1992) explained broadly on the importance of having new managers when construction companies decide to vertically integrated arguing that the construction industry is unique in that constructed products are highly different from their location, design, and construction methods. The impacts of vertical integration strategies used can lock the construction firm into narrowly defined market niches. Having the right managers makes all the difference.

Zeng et al (2018) emphasized that most managers don’t really understand how to realize the business unit synergies and other benefits of vertical integration, or the dangers of welding the firm into a wrong king of make or buy relationship. Having the right manager makes all the difference.

4.5.4.3 Adjust to different degrees of vertical integration

Another solution that was commonly mentioned was the adjustment to a different degree of vertical integration. As explained in chapter two subsection 2.3, there are four types of vertical integration. 7 interviewees out of 15 talked about the importance of avoiding using

full integration in a construction firm. They argued that other types of vertical integration such as taper and contracting are what is fit for construction firms.

The comment of interviewee F was exceptionally worth noting. *“Full Integration may prevent a construction firm from monitoring technological advances in the marketplace. A construction company would be better off using taper vertical integration to counteract this problem because if part of the construction company needs are filled by outsiders, they can act as the vehicle for bringing new ideas and technology into operations”*.

Gitonga (2011) argued that quasi vertical integration allows the general contractor the most strategic flexibility in response to market conditions because they remove market niche constraints and can be managed in a portfolio fashion.

This point has also been discussed by Lehtinen (2010) where he emphasized that 100% ownership of functions does not all the time translate to a successful vertical integration in construction. The distinction between integration through ownership as compared to integration through voluntary or contractual control is not important in assessing the benefits that might accrue to customers of integrated process' products.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This final chapter presents the conclusion that sums up the most salient takeaways of the research together with implications of the findings and recommendations. The area for further research is also highlighted at the end of the chapter.

5.2 Conclusions

The study aimed to assess the application of vertical integration in the Tanzanian construction industry. A case study approach was used in trying to achieve this objective focusing on construction firms.

The findings showed that Tanzanian construction firms are vertically integrated in both ways, forward and backwards as indicated in table 4.1 and further explained in section 4.3. In response to addressing the first specific objective which is to identify the driving factors for vertical integration to construction firms in Tanzania, the study findings showed that the main driving factor that motivates Tanzanian construction firms to integrate is the increase in competition that has come with the gradual growth of the industry in general. Kikwasi and Escalante (2018) mentioned that the Tanzanian construction industry has seen positive growth over the years in response to the country's investments in construction projects. Competition as a driving factor for vertical integration has also been mentioned by Guan and Rehme (2011) and McDougall and Round (1984). Other factors include the need to improvement quality, clients, core competence and market availability as they have been discussed in section 4.5.1.

Furthermore, in pursuit to coming to grips with the second objective which is to discern the benefits of vertical integration in relation to the Tanzanian construction industry, research findings show that the benefits of vertical integration in Tanzanian construction industry such as internalization of profit and certainty of material supply are not so different from those identified on construction in other countries such as Kenya and China, Gitonga, (2011) and Zeng et al., (2018) as literature review explains in section 2.6.

The main benefits identified were the fact that vertical integration helps contractors in cost control, maintain quality of their works, internalize profit that would otherwise have to be shared with other firms, assurance of material availability whenever it is needed for projects, eliminate buildability problems during the execution stage and stability of operations.

Moreover, the study disclosed that the main challenge for most contractors that adopt this strategy is the nature of contracts. The traditional procurement system is still dominant compared to other system such as design and build and turnkey which favor vertically integrated firms. There's a need for the government, which is the main client when it comes to big construction projects to adopt other procurement methods to help these firms and also so as to encourage other firms to adopt this strategy.

However, the study also revealed that vertical integration is still not common in Tanzania amongst contractors. Most contractors find it easier to outsource most of their building materials and machinery, traditional method of procurement is more common where designing is done by a different company from that which does the actual construction, firms largely depend on other firms for transportation of materials.

Additionally, for a vertical integration to work in construction, firms need to have a system of self-check through managers and supervisors who will be overseeing internal operations to make sure quality is attained because although vertical integration can help to maintain quality. The fact that external competition is removed calls for tight internal supervision. This finding is supported by Al Sayegh, (2010).

5.3 Implications

5.3.1 Implication for the government and policy makers

The findings of this study show that there is a need to adopt other procurement systems other than the traditional procurement system to support the vertically integrated firms. Mainly for the reason that, for a vertical integration system to work, there has to be projects that allow for it, and this is entirely up to the clients. The government, being one of the biggest clients for big construction projects. This is a call for change. Procurement methods such as turnkey and design and build would be recommended.

5.3.2 Implication for the companies

It is important to have a good plan beforehand. By having a clear vision of where you want to be as a company and how you would like to conduct your works going forward. When you want to integrate, the most important thing is to make sure you invest on something that is required on a regular basis so that your input is utilized properly so companies are advised to always check their market.

5.4 Recommendations for Future Researchers.

- The study revealed the importance of the government for vertically integrated construction firms in Tanzania to prosper. The role of the government on vertical integration in construction should be expounded more by other researchers.
- There is very little research on vertical integration in Tanzania in relation to the construction industry. The researcher would encourage future researchers to dig deeper into different angles on this topic such as the relationship between quality of projects and vertical integration.
- Work should be done to refine the vertical integration matrix for construction industry. Harrigan's model was derived by examining non-construction industries.

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APPENDICES
APPENDIX I
INTERVIEW GUIDE

Research Title: *“Application of Vertical Integration in the Tanzanian Construction Industry.”*

Dear Participant,

My name is Catherine Luambano; I am a Masters student at Ardhi University in Dar-es-Salaam Tanzania. You are kindly invited to participate in a research project titled **“APPLICATION OF VERTICAL INTEGRATION IN THE TANZANIAN CONSTRUCTION INDUSTRY”**.

The aim of the research is to assess the application of vertical integration in the Tanzanian construction industry so as to propose what should be done to make vertical integration more fitting for the Tanzanian construction industry and maximize its benefits.

This interview guide was developed to ask you a few questions on the topic. I believe the information gathered through this interview will be useful in improving vertical integration practices in the construction industry which will in turn improve the construction industry at large.

With your permission, I would like to record our conversation. This is for the purpose of saving time and to avoid skipping some valuable information. The information taken from you will be treated with utmost confidentiality. Furthermore, the information we gather from this interview will only be used for academic purposes. At any point of time, if you feel like stopping the recording you can inform me and I will stop.

There are no any identified risks from participating in this research.

Thank you for your consideration.

SECTION A: GENERAL INFORMATION QUESTIONS

1. What is the name of the company that you work for?
2. What is your current position in the company?
3. For how long have you been serving in this position?
4. What is your role in the company?
5. For how long have you been working in the construction industry?
6. Apart from actual construction, what other construction related activities does your company deal with?


7. For how long has your company been dealing with the above-mentioned activities?

SECTION B: VERTICAL INTEGRATION RELATED QUESTIONS

1. What are the driving factors that motivated your company to diversify into other construction related activities?
2. What are the benefits of this diversification?
3. What are the challenges that your company has faced as a result of this diversification?
4. Which strategies do you use or plan to use to address the limitations and maximize the benefits of the diversification?

APPENDIX II
INTRODUCTION LETTER

ARDHI UNIVERSITY

<p>Telephone: +255 738 357 310, 738, 357 311, 738 357 312 Fax: +255 22 2775391 Telegrams: ARDHICHUO</p>		<p>P. O. Box 35176 Dar es Salaam e-mail: aru@aru.ac.tz website: http://www.aru.ac.tz</p>
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Ref.No. ARU/A.2013/ **Date:** 11th May, 2021

TO WHOM IT MAY CONCERN

Dear Sir/ Madam,

RE: INTRODUCTION LETTER FOR POSTGRADUATE STUDENT


Refer to the subject above.

The Student above is pursuing Masters of Science in Construction Economics and Management (MSc. CEM) in our University. As a Student she is required to do dissertation work as part of the requirements for the award of the Masters of Science in Construction Economics and Management (MSc. CEM). For the accomplishment of this exercise, students are required to carry out literature review, extensive search for field data and subsequently analyse the same for conclusive scientific results.

We are therefore requesting you to assist the bearer of this letter **Ms. Catherine Lwambano**, with **Reg. No. HD/T.1392/2019**, who will need information from your organisation. The title of his Dissertation is ***"Application of Vertical Integration in the Tanzanian Construction Industry."***

Thank you for your cooperation and contribution.

Yours Sincerely,


 Dr. Shubira Kalugila
For: Deputy Vice Chancellor
Academic Affairs