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Full Length Research Paper

Exploring barriers affecting suppliers in the mines in Zambia

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The global value chain has become an important strategy to link local suppliers to the various commercial activities that are performed during the production of goods and services. The chain actors involved join together in distinctive processes to produce a product in a win-win situation. This means that even the marginalized local suppliers are given an opportunity to supply along the chain and earn income. However, due to the complexity nature of the value chains, local suppliers continue to face challenges to derive some benefits from the chains due to unknown barriers. The objective of this study was to find out the major barriers that suppliers face in the mining global value chain in Zambia. The analysis was based on survey data set obtained from 350 purposively sampled suppliers who are members of the mining suppliers and contractors association of Zambia. Exploratory factor analysis was used to find the barriers affecting suppliers in the mines. The results revealed public and private sector barriers as well as individual supplier capacity barriers. The study also presented some major policy implications for the mining global value chain in Zambia. In addition, the study proposed areas for further research to be done on a broader data set from other mining areas in other countries to validate the findings of this study.

Key words: Global value chain, suppliers, mines, small, medium enterprises.

INTRODUCTION

The mining sector worldwide creates employment directly and indirectly through its global value chain activities. The global value chain (GVC) covers the full range of activities performed by various firms to bring a product from its inception to the end user and beyond (OECD, 2013a). The costs and benefits of the mining global value chain to local communities and the relationship between them are subjects that have become important

in developing and developed countries (IFC, 2002; OECD, 2013b). Most countries have witnessed sustainable benefits between communities that provide services to the mines (IFC, 2002). In Canada as well as Malaysia, small and medium enterprises (SMEs) who are linked to the mining activities have become global suppliers as they have participated and adapted to international requirement (Ata, 2013). The Caribbean

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countries are also examples of SMEs development that are linked to commercial activities of the global value chain (SELA, 2012). These successful linkages in most countries have been facilitated by eliminating various barriers (Gereffi, 2013) which unfortunately in the Zambian front continue to taut SMEs (Chibwe, 2008). Small and medium enterprise have always been described as drivers of any economy through their economic activities but alas the opportunities which SMEs might access from the mines are scarce which leaves various questions as to what exactly are the barriers affecting SMEs to supply to the mines in Zambia. Recent studies in the Zambian mines by the CMZ & ICM (2014:4&68) confirm that local SMEs are unable to supply to the mines due to unknown barriers.

As reflected by the struggling SMEs to supply to the mines in spite of the local content policies the effects of many unknown barriers affecting the inclusiveness of mining global value chain is a reality that must be tackled by researchers, policy implementers and other stakeholders. It is important to have a full grasp of a common framework of barriers to develop a strategy to overcome them and improve connectivity among stakeholders in the mining global value chain. Regrettably, no convincing understanding of such barriers is available to policy implementers in Zambia.

This study, henceforth, responds to the questions regarding the barriers affecting SMEs to supply to the mines. The research process begins with a review of the available literature to gain insight on the barriers affecting suppliers in the global value chain. In addition, the review of the global value chain theory helps in understanding the relevant concepts on how value chains are governed and how to make them inclusive. Thereafter, the research design and methodology is explained as well as the rationale behind the selection of methods. The research continue in its process by presenting findings based on primary data collected from SMEs who are registered by the mining suppliers and contractors association of Zambia and supplemented by secondary sources. Finally, the key findings are discussed to pave way for implications and conclusions for policy implementers, researchers and other stakeholders.

LITERATURE REVIEW

In this study, global value chain (GVC) theory is being used to gain insight in the relationship between private sector activities through production and trade on one hand and linkages of SMEs to these activities on the other. The theory specifically focuses on the role of GVC in international networks of companies for a win-win situation. However, the governance of this network poses lots of challenges that affect some stakeholders to participate in the global value chain. There is confusion on a number of related theoretical approaches found in

literature that describe international networks of companies. These include value chains, global commodity chains, value systems, and value networks (Gereffi, 2013). Global commodity chains is described as "a set of inter-organizational networks which are clustered around one commodity linking to households, enterprises, and states to one another within the world economy. As regards to the global value chain and value chain of Porter, the overlap between the two arises due to nomenclature on Porters work in the mid-1980s (Kaplinsky and Morris, 2001). The value system also bestows similar meaning to GVC. It is described as a set of inter-linked 'complete' firms specialized in value chain functions and is thought of by other researchers as 'incomplete' firms that are specialized in certain value chain functions such as design and marketing. The value system's focus is the organization network as a unit of analysis. Another similar theory to GVC is the value network approach which provides new insights to the concept of value chain. Although there is a clear difference between them, most scholars interchange them.

In this study, the main focus is the relationship between global value chain and supplier inclusion. The GVC theory help in identifying the leverage points along the chain that would yield highest potential for improving relative benefits for SMEs (Hoermann et al., 2010). It also helps in spreading the gains in the chains and economic integration into international design, production, and marketing of many different firms (OECD, 2013a). GVCs also act as a route to market for export products and services which in turn directly spawn value added contributing to gross domestic products (GDP), job creation, income generation, and tax income. Most stakeholders advocate for the promotion of GVC inclusion by building SME's capabilities, facilitating improved market opportunities, and improving the quality of information available for them to make correct decisions. Trade, investment, and knowledge flows are significant factors that underpin GVC and provide mechanism for rapid learning, innovation and industrial upgrading. Acquisition of skills and new competencies are linked with participation in GVC in which transactions and investments come with quality control systems and standards that exceed those in developing countries. The participation in GVCs broadens the scope for getting gains from an open trade and investment regime, and thus diminishes pressures for protectionism. This helps producers from developing countries to enter foreign markets, earn more foreign currencies, diversify their exports, and get new skills, knowledge and technology which are considered as key factors for productivity enhancement and growth. However, there are a number of barriers that SMEs face to participate in the GVC (Cattaneo et al., 2013). The lack of knowledge of the actual barriers affecting suppliers in the mines makes it difficult for policy formulation to curb the scourge.

However, strides have been made by NGOs and governments to improve the supplier presence in the mining global value chains. Donor support strengthens the weakest link to address potential bottlenecks. In addition, they help improve flows of knowledge and resources to make all suppliers productive in the chains. In other veneration, most governments have been supportive in investment in R&D and improving the position of suppliers in the value chains. Governments also reduce tax burden, eliminates border thickness and improve infrastructure as a method to enhance inclusion of suppliers to the chains. Unfortunately, these efforts do not achieve significant improvement to enable suppliers participate in the chains as they are a broad strategy. Therefore, a correct grasp of the barriers of entry is helpful in improving the position of supplier's in the value chain. Some scholars have in general terms alluded to standards requirements, tax compliance, registration processes, licensing requirements, technology upgrade, capacity requirements, managerial competencies, competition and financial capacity all of which act as barriers affecting suppliers to participate in the global value chain (Kaplinsky, 2010; Tijaja, 2013).

Standards are products and process specifications so that wide range of global suppliers delivers according to the requirements of the markets. The failure to meet these standards may lead to exclusion from the GVC (Cattaneo et al., 2013; Tijaja, 2013). Most suppliers face some challenges in meeting standards which are beyond their local capacity. Standards create unnecessary obstacles where local producers are unable to meet international requirements (Tijaja, 2013). Sometimes, local producers adjust to the standards of the buyer by replacing local materials with imported ones which in itself is very expensive. Government imposed standards may raise the cost of local production obliterating trade and investment. In addition, badly enforced standards for standards agencies minimize backward linkages as well as reduce spill-over effects of foreign direct investment (FDI). This entails that inputs may be imported to meet standards of lead firms and local tasks are confined to basic manufacturing thereby affecting local supplier participation in the chains. In-line with standards is the management of tax whose structure is not conducive for local suppliers as it creates a greater burden to the taxpayers and ultimately affecting the final consumer due to its shifting ability. Mnawa and Maliti (2008) stressed that most SMEs fail to maintain their growing profitability due to inflexible tax policies and yet these SMEs are the backbone of economic growth. While standards and tax structure have failed the suppliers in the global value chain, the regulation of various activities of the global value chain seems to favor and work for the suppliers as most governments worldwide use them to nurture suppliers. A well-designed structural government policy associated with good licensing and permits system, company registration processes, licensing requirements,

property rights law, certification procedures, efficient dispute settlement procedures and bankruptcy law are cardinal in GVC (OECD, 2007a). The governments' initiative to set up business incubators to support local SMEs to access financial support, upgrading possibilities, business linkages and technical support are crucial components supporting supplier linkages to the chains. However, some regulations may constrain SMEs growth and productivity as a lot of questions arise such as "Why is the government imposing too much regulation? When do SMEs feel that regulation is constraining the growth and productivity of SMEs? It is true that some administrative procedures have become redundant and are now barriers as they do not meet the intended objectives (Kaplinsky, 2010). Alongside the government regulation is the governance of the global value chain where private sector dominates. Most value chain such as the mines is buyer driven and therefore they decide what to buy, when to buy and who participate in supply chains although local content policies give priorities to local suppliers. Some scholars have shown that SMEs must upgrade and meet international requirements to participate in the chains but this is out of reach of local SMEs (Gereffi, 2013).

Apart from standards, tax, registration processes and licensing requirements, the lack of innovation and capacity building limit entry of SMEs into GVC. The predominance of flows in the global value chain requires adaptability to lead firms' request, responsiveness, and innovative capacity. Most countries therefore require a greater capacity for scale of production, availability of services necessary to support production and market integration, education and skills of the workforce matching the needs of global producers and buyers, and capacity for innovation in its multiple dimensions (Cattaneo et al., 2013). Managerial and financial resources as well as inability to upgrade and protect in-house technology are a barrier of entry into GVC (OECD-APEC, 2006; OECD, 2007b; SELA, 2012). SMEs also lack the scale to invest in R&D, lack access to knowledge, technology, credit and markets. In addition, access to trade finance, compliance with standards, and high market entry costs are common barriers of entry into GVC (OECD/WTO, 2013a). There is also a question of competitiveness where Caspari (2003) maintains that firm size stands as a barrier in the ever-fierce competitive environment where global firms fight for greater market share and may become "manufacturers without factories". In addition, global firms concentrate on highest value added parts of the global value chain from selected suppliers who have the capacity to fulfil orders on time, and supply the required quality. Gereffi's (2000) analysis of the apparel industry in North America show that the investment requirements needed for high value activities are out of reach of the SMEs. However, it is important to note that in the value chain, there is an opportunity for learning, partnerships and upgrading (UNIDO, 2004).

METHODOLOGY

In the study, a positivist paradigm was adopted to identify the barriers that suppliers face in the mining global value chain in Zambia. This approach was appropriate as the units of analysis are quantifiable registered suppliers of the mining suppliers and contractors association of Zambia. Since the respondents are known and available out there in the field, this approach therefore is in-line with the recommendations of Creswell and Clark (2011) who says that the use of the positivist approach for such similar situation is consistent with ontological and epistemological view that reality is external and objective. In order to collect data, a cross-sectional descriptive survey research was utilized which described the events as they currently occurred, as well as how they are related to other factors in the present conditions (Bryman and Bell, 2015; Creswell, 2014). This study then adopted a global value chain theory which breaks down the variables under discussion. This break down of variables makes it easier to collect and analyze relevant data on the main barriers that SMEs face to supply to the mines. The analysis of the global value chains is central to policy implementers to identify areas for intervention in the chains. In line with the positivist paradigm which demands to collect primary data through quantitative methods, a standardized questionnaire was developed.

Selecting samples

In the quest to determine the correct respondents, a selection criterion was done to ensure adequate representation of all segments of the mining global value chain in Zambia. In order to ensure that a correct framework of barriers is assessed, the study considered suppliers who have been registered with the mining suppliers and contractors association of Zambia and have never been de-registered due to non-payment or any other reason. In addition, the respondents were those suppliers who had served membership of the association for over 5 years and were well versed with the intricacies of the mining global value chain. The sampling method was snowball based on the work experience, membership of the mining association, knowledge of each other and the respondent's involvement with the mining global value chain. This non-probability sampling technique resulted in the recruitment of 720 respondents.

Data collection

Primary data collection was done over a period of 4 months starting December 2018 to the end of March 2019. This study used standardized questionnaires which were completed by respondents through a cross section survey. The questionnaire development process proposed by Neelankavil (2015) was adopted to ensure quality. Neelankavil (2015) proposes a rigorous process of reviewing research objectives and research questions to streamline them to information needs and thereafter pretesting the questionnaire. The internal consistency method as estimated by the Cronbach's alpha was used to measure reliability. This measure is very important as it reveals the similarity of items in the instrument that is used to tap the constructs. One assumption of factor analysis is that items should at least be 70% reliable (Field, 2009; Hair et al., 2010). To avoid discrepancies in the answers, some follow-ups were conducted although badly answered questionnaires reduce the reliability of the items. Further, to improve the validity, a desk review was done using current literature in journals and other relevant material to assess the collected data.

The data collection process resulted in distribution of 720 questionnaires to the respondents. There was a small diary for

them to use for taking some notes and a pen to be used for answering the questionnaire. These items were proposed to be retained for the respondents after answering the questionnaire as a token of appreciation as well as offering them convenience in answering the questionnaire while acknowledging the conflict nature of respondent incentive. The respondents were sent a friendly reminder after ten (10) days and this strategy worked very well as 400 questionnaires were returned. Further, the researcher checked the questionnaire for correct answering upon receiving them. Thereafter, the questionnaires were numbered for easy identification for future review. The data was loaded into an Excel software package after which it was transferred into the IBM SPSS software package for subsequent analysis

Data analysis

As regards the questionnaire, the items were measured using the "five-point Likert scale from 1 to 5" rating, with choices from "strongly disagree" to "strongly agree". Before performing a factor analysis, a statistical test was done using IBM SPSS to identify patterns on the characteristics of the sample from the mining global value chain suppliers. The researcher used Microsoft excel to develop a data sheet then transferred it into the IBM SPSS statistical package. In addition, data was reviewed several times for the purpose of cleaning against possible errors and omissions. Finally, data was analyzed using exploratory factor analysis (EFA).

RESULTS

This study was undertaken produce a common framework of barriers affecting suppliers to supply to the mines. The identification of such barriers in this study was relevant in assisting the policy implementers and other stakeholders in Zambia. This would further help in formulating and executing appropriate strategies to enhance supplier inclusion in the global value chain.

Questionnaire response rate

A total of 400 out of 720 suppliers completed and returned the questionnaires. There were Fifty (50) questionnaires not suitable for processing. Some questionnaires were not fully answered while other questionnaires from some respondents were rejected because of respondents' failure to complete the consent form. The useable questionnaires were three hundred and fifty (350) giving a response rate of 55% of the total sample of the identified mining global value chain suppliers. This sample was adequate as indicated by the KMO test as shown in subsequent analysis.

Statistical analysis

Cronbach's alpha which enables the estimation of consistency in the questionnaire items was employed to check the reliability of the instrument (Field, 2009; Hair et al., 2010). Cronbach's alpha ranges from 0 to 1 with

Table 1. Cronbach's alpha for the items used in this study.

Reliability statistics	
Cronbach's alpha	No. of items
0.795	9

Table 2. KMO and Bartlett's test of sphericity on supplier barriers in the mining global value chain.

KMO and Bartlett's test		
Kaiser-Meyer-Olkin measure of sampling adequacy		0.734
	Approximate chi-square	1169.524
Bartlett's test of sphericity	df	36
	Sig.	0.000

Table 3. Eigenvalues of supplier barriers in the mining global value chain in Zambia.

Component	Initial Eigen value		Cumulative (%)
	Total	% of variance	
1	3.565	39.616	39.616
2	1.497	16.636	56.252
3	1.006	11.179	67.432

those alpha coefficients closest to 1.0 revealing highest internal consistency on the items. Nonetheless, any value above 0.6 can be accepted as posing satisfactory item reliability (Hair et al., 2010 (Table 1)).

Exploratory factor analysis

An exploratory factor analysis (EFA) was conducted on the instrument items to reduce the number of variables and to categorize them (McDonald, 2014; Bartholomew et al., 2011). In exploratory factor analysis, it is important to assess whether the items on the instrument were factorable. Therefore, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the Bartlett's test of sphericity was used to decide on the factorability of the research data. When the test results show KMO of 0.6 or better, then the data set is factorable (Kline, 2013). Presented in Table 2 are the results of KMO and Bartlett's tests on the dataset from the mining global value chain in Zambia.

Table 2 show that the KMO value for the data (KMO = 0.734) was greater than the benchmark of 0.6. This means that factor analysis was possible (Dimitrov, 2014). In addition, the Bartlett's test result (Chi square Bartlett test = 1169.524 (df = 36), $p = 0.000 < 0.05$) was significant implying that there was sufficient correlation among the variables to allow factor analysis. Accordingly, the two tests were satisfactory for factor analysis to be used in the study (Field, 2009; Hair et al., 2010)

Supplier barriers in the mining global value chain in Zambia

The three (3) barriers that affect SMEs to supply to the mines in Zambia were identified and coded in the study as barrier 1 to barrier 3 and as can be seen in Table 3; barrier 1 contributed much of the total variance explained, with 39.616%. The least contributor was barrier 3, contributing to about 11.179% of the total variance explained. The three components were extracted with eigenvalues greater than 1. The results of the initial factor solution after the factor analysis are presented in Table 4.

Table 4 shows the component matrix before rotation whereas it contains the loadings of each variable onto each factor. In the analysis, it was requested that all loadings less than 0.4 be suppressed in the output and hence the table show blank spaces for many of the loadings. Further, the variables are listed in the order of size of their factor loadings because the output to be sorted by size was requested. It was difficult to determine which items defined which barriers from the initial solution above. Therefore, factor rotation was carried out to improve interpretability. The results of Varimax with Kaiser Normalization factor rotation are presented next in Table 5. As can be seen in Table 5, it was easier to interpret the barriers, since the distribution of items was spread across all the three (3) barriers extracted from the dataset from the mining global value chain in Zambia.

The rotated table matrix shows content of questions

Table 4. Initial solution on the barriers affecting suppliers to the mines

Item	Component		
	One	Two	Three
Competition affect SMEs to supply to the mines	0.834		
Technology inhibits SMEs to supply to the mines	0.816		
Lack of financial support limits SMEs to supply to the mines	0.813		
Standards requirement is a barriers for SMEs to supply to the mines	0.704		
SME managerial skills limits SMEs to supply to the mines	0.648		
Compliance to various Licenses affect SMEs to supply to the mines	0.432	0.714	
Registration process is a barrier for SMEs to supply to the mines		0.438	-0.410
SME capacity to meet orders is a barrier to supply to the mines		0.556	0.701
Tax policy affect SMEs to supply to the mines	.468	0.415	-0.478

Table 5. Varimax with Kaiser Normalization factor rotation on supplier barriers in the mining global value chain in Zambia.

Item	Component		
	One	Two	Three
Lack of financial support limits SMEs to supply to the mines	0.876		
Competition affect SMEs to supply to the mines	0.864		
Technology inhibits SMEs to supply to the mines	0.859		
Standards requirement is a barriers for SMEs to supply to the mines	0.726		
SME managerial skills limits SMEs to supply to the mines	0.534		
Tax policy affect SMEs to supply to the mines		0.769	
Registration process is a barrier for SMEs to supply to the mines		0.702	
Compliance to various Licenses affect SMEs to supply to the mines		0.599	0.580
SME capacity to meet orders is a barrier to supply to the mines			0.933

that load onto the same factor to identify common themes. The questions that load highly on factor 1 seem to all relate to barriers due to lack of support from private sector and this has been labeled as private sector barriers. The questions that load highly on factor 2 all relate to different aspects of lack of support from government statutory requirements; therefore has been labeled public sector barriers. The two questions that load highly on factor 3 all seem to relate to individual capacity of SMEs; therefore labeled as capacity barriers. This analysis seems to reveal that the initial questionnaire, in reality, is composed of three sub-scales: Private sector barriers, public sector barriers and individual capacity barriers (Table 6).

DISCUSSION

In the study, factor loadings estimated from 0.4 to 0.9 on identified themes were employed to make decisions on the extracted barriers in the mining global value chain. The higher the absolute factor loadings that the inherent item adds, the more it symbolized the underlying. This guaranteed the unidimensionality of the items of each

barrier (Field, 2009; Hair et al., 2010). Moreover, the researcher relied on established theoretical constructs to describe the barriers which reduced the threat to validity. Major outcomes that arose from the research data offered important insights and also were a significant step towards the discovery of the framework of barriers affecting suppliers in the mining global value chain in Zambia.

Private sector barriers

The mining global value chain is buyer driven and lead firms decide when and what to buy from the suitable suppliers. The chains are governed by the mining companies who set standards and other requirements that continue to exist as bottlenecks. In using value chain approach, key downstream private sector chain actors can be involved in the identification of key bottlenecks within the value chain that are mutual constraints for both upstream and downstream players. This may facilitate ownership and agreement on subsequent key interventions and policy reforms (Hoermann et al., 2010). Multi-stakeholder partnership strives to include

Table 6. Summary of supplier barriers in the mining global value chain in Zambia.

Factor 1. Private sector barriers
Lack of financial support limits SMEs to supply to the mines
Competition affect SMEs to supply to the mines
Technology inhibits SMEs to supply to the mines
Standards requirement is a barriers for SMEs to supply to the mines
SME managerial skills limits SMEs to supply to the mines
Factor 2. Public sector barriers
Tax policy affect SMEs to supply to the mines
Registration process is a barrier for SMEs to supply to the mines
Compliance to various Licenses affect SMEs to supply to the mines
Factor 3. Individual capacity barriers
Compliance to various Licenses affect SMEs to supply to the mines
SME capacity to meet orders is a barrier to supply to the mines

smallholders into the value chains, and enhance their sustainability through overcoming government failures, and increasing efficiency in the value chains. Supplier development programmes are one aspect to enhance supplier productivity. Indeed, the numerous demands towards suppliers to upgrade technology, exhibit financial prowess, show good managerial competencies, meet standard requirement and competitiveness is a great barrier in the mining global value chain (Gereffi, 2013; Cattaneo et al., 2013; OECD, 2013a)

Public sector barriers

Public sector organizations which may also be referred to as government agencies regulate the industry through various sound policies, laws, and regulations to ensure free and fair competition, and decent and productive work of all stakeholders. The regulation helps in reducing the regulatory constraints on SMEs growth and improves the business development, economic growth and job creation. However, lots of questions arise regarding regulation or legislation processes such as "Why is the government imposing too much regulation? When do SME feel that regulation is constraining the growth and productivity of SMEs? When is regulation becoming a red tape? And how may we identify areas where regulatory compliance costs are most troublesome for firms?: How may we review the regulations in order to identify opportunities for streamlining these processes and make them more efficient and less costly both in terms of real costs and opportunity costs for firms? It is true that some administrative procedures may have been relevant at some point in time, but have become redundant and barriers as they do not meet the intended objectives (Kaplinsky, 2010). In addition, there are compliance costs

which are regulations giving rise to direct and indirect costs for the firm when it has to comply with administrative procedures, certificates, specific licences, completing tax and value added tax (VAT) return forms. Some are real costs in terms of compulsory fees and rates and others are opportunity costs because of time consuming procedures, which a business owner need to spend time on. The different types of compliance costs can have significant implications for the businesses but also for their consumers to whom the costs may be passed on (Tijaja, 2013).

Individual capacity barriers

The global value chain has been instrumental in forming linkages with its downstream and upstream suppliers. It is true that although capacities and productivity have continued to be tipping points for lead firms to partner with local SMEs, the global value chains reduce the constraints (UNCTAD, 2010; Cattaneo et al., 2013). However, a number of factors determine participation in the global value chain which in itself is not easily adaptable by suppliers. These may include; capacity for scale of production which was one of the findings of the study as most suppliers were unable to meet the mining capacity requirements; availability of services necessary to support production and market integration which was also found as a barriers for SME growth and productivity. The other factor affecting supplier capacity include skills of the workforce matching the needs of global producers and buyers (Cattaneo et al., 2013:27), which was among the major findings of the study as suppliers cannot meet the required technology and standards in the mining global value chain. Suppliers also were faced with the problem of financial and trade support (OECD (2013a:25),

and the findings showed that most unsuccessful suppliers fall into this category.

Conclusion

This study investigated the supplier barriers in the mining global value chain in Zambia. A global value chain theoretical approach was employed to provide a conceptual framework for identifying the barriers affecting suppliers in the mining global value chain. This framework managed to provide answers to the problem faced in this study. In addition, this study provided empirical evidence on the barriers affecting suppliers to the mines. The empirical results revealed that there are public, private and individual supplier capacity barriers hindering suppliers to successfully supply to the mines. In the mining sector, public, private and individual supplier capacities were found to be major barriers. This study contributed to the body of knowledge in the field of business as well as the public domain through the suggested formation of the framework of unique supplier barriers. Managers and policy makers in the mining global value chain can now develop strategies to overcome such barriers to improve the position of suppliers in the mining global value chain.

Recommendations

A reduction of supplier barriers in the mining global value chain may help improve linkages of suppliers to the mines. The following measures could help deal with the most potent barriers as revealed in the study.

Private sector barriers

It is recommended to create a Supplier Development Working Group comprising executives from the mines, mining suppliers and contractors association of Zambia, NGOs, and the ministry of mines whose task will be to identify and implement global value chain governance strategies, economic, social and technological upgrading of SMEs, supplier and buyer partnerships, on-site technical support and business development and any economic program of the non-functional supplier development programme so that SMEs build capacity for competitiveness

Public sector barriers

The Ministry of Mines must setup a mining commission through an Act of Parliament whose objective among others will be to implement the the Mines and Minerals development Act No.11 of 2015, Section 31&32 that empowers it to give mining licences to those providing

employment, training and business promotion development with local stakeholders. In addition, Zambia National Content Development and Monitoring Board must be formed by the government through an Act of Parliament so that various "local Content Committees for specific economic sectors" will ensure that a certain share of factors of production required at various stages of the value chain is sourced from the domestic economy.

Individual capacity barriers

The Citizenship Economic Empowerment Commission must be transformed from merely offering micro-credits to selected sectors of the economy into a Business Incubator for SME development so that its local incubation facilities and innovation system are created for nurturing SMEs providing integrated technical and business development support to SMEs, mentoring and coaching SMEs, technology upgrading for competitiveness to SMEs participation in the mining global value chain

Limitation of the study

There were some limitations in the study in spite of the good methodological approach. The structured questionnaires may have provided a generalized phenomenon while disregarding some important insights. To address such limitations, the data presented in this study as well as any recommendations must be amplified with other essential datasets from further research from NGOs literature, government publication and mining sector. There is a further need for refining the barriers through an internal review supported by further collection of feedback from more stakeholders from within the mining global value chain.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

The determinants of the corporate effective tax rate of Italian private companies

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This study investigates the determinants of the corporate effective tax rate (ETR) of Italian private (unlisted) companies in 2016 and 2017. Although a large body of research has addressed the issue of the determinants of the ETR, both the Italian context and the private companies have been the object of scant attention in previous studies. To test research hypotheses, as in several previous studies, a pooled cross-sectional OLS model has been adopted. The study shows a statistically significant and negative (positive) association between ETR and firm size, investment in tangible fixed assets, inventories, investments in subsidiaries, affiliates and other companies, and the firm's profitability (intangible fixed assets and the firm's indebtedness). Conversely, it shows no statistically significant association between ETR and tangible fixed assets. The financial year in question, the region where companies are located, and the economic sector they belong to, included as control variables, affect the ETR. Italian public policy-makers and Italian and non-Italian economic operators can benefit from the results of the study in order to make more informed future decisions.

Key words: Effective tax rate, private companies, Italy.

INTRODUCTION

A large body of research has addressed the issue of the determinants of the corporate effective tax rate (ETR). The ETR can be defined as the tax rate that a company actually pays on its earnings. Although the ETR has been measured in different ways in the literature (Hanlon and Heitzman, 2010), in this study it is measured in the most recurrent way, namely as the ratio between income tax (current, deferred and prepaid taxes) and earnings before income tax, as they are reported in the income statement.

A large body of research has addressed the aforementioned issue because the ETR, more than the standard tax rate (that is, the tax rate set by fiscal

regulations), provides an actual measure of the tax burden that a company in a given country must bear. In fact, the ETR generally does not correspond to the standard tax rate, but derives from the combination of the level of the standard tax rate and the set of tax rules that determine the tax base on which to apply the standard tax rate.

Public decision-makers may have a vested interest in the ETR because it can serve as an economic policy tool. Indeed, by acting on the ETR level, they can encourage or discourage the birth, development, and localisation of entrepreneurial activities. In this perspective, it is also a

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competitive tool for individual countries' governments because it can be used to encourage foreign economic operators to establish their headquarters in their territory (Altshuler and Goodspeed, 2015; Genschel and Schwarz, 2011; Wilson, 1999).

Moreover, even economic operators could have a great interest in the ETR and, above all, in its determinants. Indeed, the latter could be included among those factors able to influence the taking of certain decisions. For example, some studies have shown that the ETR can influence companies' decisions on capital structure (Huang and Song, 2006; MacKie-Mason, 1990) or foreign direct investment (Bénassy-Quéré et al., 2005; De Mooij and Ederveen, 2003).

The aforementioned interest has led researchers to address the issue of the determinants of the ETR. Although there is a rather broad consensus on the main determinants that seem to be able to explain the variability of the ETR (e.g. firm size, asset mix, leverage, and profitability), previous studies have mainly focused on certain countries (U.S.-centered studies are particularly numerous) and on larger companies (listed ones, generally), and their findings are often inconclusive because differences have been found from country to country and, even within the same country, from one time period to another. This suggests that the determinants of the ETR are country- and time-specific. In other words, the significance of certain determinants could depend on the set of accounting and fiscal rules in force in the country and in the time period under investigation.

Starting from these premises, this study aims to investigate the determinants of the ETR in the context of Italian private (unlisted) companies. Neither the Italian context nor private companies appear to have been the object of much attention in literature. To the best of our knowledge, only Parisi (2016) and Santosuosso (2017) have addressed the issue of the determinants of the ETR with specific reference to the Italian context. However, the former has investigated private companies operating decades ago (1998-2006), while the latter has investigated only public companies. Due to the fact that accounting and tax rules are affected by frequent changes, it is believed that those that may be interested in the determinants of the ETR, particularly policy-makers and economic operators, would find it more useful to know what is happening today (or certainly in a more recent time period) rather than what happened in the somewhat distant past. Therefore, in order to maximise the usefulness of the findings of the investigation, this study is focused on a very recent time period (2016-2017).

The reasons underlying this choice are two-fold. Firstly, we believe the findings of the investigation to be more useful. While we acknowledge that the year 2018 should also have been included, at the time when the necessary data was extracted for the investigation, the data for 2018 was only available for a small number of companies.

Secondly, the time period investigated had to be relatively homogeneous with regards to the accounting and fiscal rules in force in the context investigated. In reference to this point, we underscore that as of 1st January 2016 new accounting and tax rules came into force and remained relatively constant thereafter.

THE ITALIAN CORPORATE TAX SYSTEM: AN OVERVIEW

Italian companies are subject to a state corporate income tax, known as "*imposta sul reddito delle società*" (IRES), regulated by the Decree of the President of the Republic (D. P. R.) of 22nd December 1986, n. 917, and to a regional production tax, known as "*imposta regionale sulle attività produttive*" (IRAP), regulated by the Legislative Decree (D. Lgs.) of 15th December 1997, n. 446.

The standard IRES rate was 27.5% until fiscal year 2016. Since fiscal year 2017 it is 24% (art. 1, par. 61, of the Law of 28th December 2015, n. 208). IRES is charged on the total net income reported in a company's financial statements as adjusted for specific tax rules.

The standard IRAP rate is 3.9% and is levied on a regional basis. The regions are allowed to increase or decrease the standard IRAP rate up to 0.92%. Moreover, different standard IRAP rates are applicable for certain entities. Companies with facilities in different regions must allocate their overall taxable base to the different regions based on the employment costs of personnel located at the various sites. There are different methods of computation for the IRAP taxable base, depending on the nature of the business carried out by the taxpayer. For sales and manufacturing companies, it is broadly represented by the company's gross margin in its financial statements. Interest income and expenses, provisions for bad debts, provisions for liabilities and risks, and certain extraordinary items are excluded from the IRAP taxable base. In addition, the deduction of labor costs depends on the type of hiring contract adopted.

DETERMINANTS OF THE EFFECTIVE TAX RATE AND PROPOSED HYPOTHESES

In order to develop the research hypotheses, three main aspects are taken into consideration: (a) the way the ETR is measured in this study, (b) the findings of previous studies, and (c) the main tax rules in force in Italy in the time period subject to investigation that may affect the associations between the characteristics of the companies and the variability of their ETR.

With reference to the first aspect, in this study the ETR is measured as the ratio between income tax (current, deferred and prepaid taxes) and earnings before income tax:

Table 1. Findings of some previous studies.

Reference	Size	Capital intensity	Inventory intensity	Indebtedness	Profitability
Adhikari et al. (2006)	Mixed	-	No	Mixed	-
Armstrong et al. (2012)	No			no	+
Chen et al. (2010)	Mixed	-		Mixed	Mixed
Delgado et al. (2018)	Non linear	No	Non linear	non linear	Non linear
Derashid and Zhang (2003)	Mixed	-	No	Mixed	Mixed
Fernández-Rodríguez and Martínez-Arias (2014)	Mixed	Mixed	Mixed	Mixed	Mixed
Gupta and Newberry (1997)	No	-	+	Mixed	+
Harris and Feeny (2003)	Mixed	Mixed		+	Mixed
Irianto et al. (2017)	-	No		No	-
Janssen (2005)	-	-		+	Mixed
Kraft (2014)	+			-	-
Lazar (2014)	No	-		-	+
Liu and Cao (2007)	No	No		-	+
Moreno-Rojas et al. (2017)	Non linear	No		Non linear	Mixed
Noor et al. (2008)	+	Mixed	No	Mixed	-
Parisi (2016)	+	-	+	-	-
Richardson and Lanis (2007)	-	-	+	-	Mixed
Salaudeen and Eze (2018)	Mixed	Mixed	Mixed	Mixed	+
Stamatopoulos et al. (2019)	+	-	-	No	Mixed
Wang et al. (2014)	+	+		+	

“+” Statistically significant and positive association; “-” statistically significant and negative association; “no” not statistically significant association; “non linear” statistically significant and non linear association; “mixed” different level of statistical significance and/or different sign of the association (this can occur when the study investigates different countries or uses more than one measure for the ETR or regression model).

$$ETR = \frac{\text{income tax}}{\text{earnings before income tax}} \tag{1}$$

Previous studies have used various measures for the ETR (for a review of these measures and their meaning (Dunbar et al., 2010)). However, the measure used in this study appears to be the most widely adopted in literature and the most consistent with the aims of this study. Assuming that CT is current taxes, DPT is deferred and prepaid taxes, EBT is earnings before tax, SR is standard rate, PD is permanent differences, and TD is temporary differences, Equation 1 can be rewritten as follows:

$$ETR = \frac{CT \pm DPT}{EBT} \tag{2}$$

$$ETR = \frac{SR \times (EBT \pm PD \pm TD) \pm DPT}{EBT} \tag{3}$$

$$ETR = \frac{SR \times (EBT \pm PD) \pm (SR \times TD) \pm DPT}{EBT} \tag{4}$$

$$ETR = \frac{SR \times (EBT \pm PD)}{EBT} \tag{5}$$

$$ETR = SR \times \left(1 \pm \frac{PD}{EBT}\right) \tag{6}$$

Equation 6 shows that the variability of the ETR is due to the sign and magnitude of permanent differences. It is given that permanent differences between accounting income, before income tax, and taxable income result when expenses (losses) or revenues (gains) are recognised in the former but are never recognised in the latter or vice versa. The differences are permanent as they do not reverse in the future. Permanent differences result in a difference between the company’s ETR and the statutory tax rate. Therefore, hypothesising associations between the companies’ characteristics and the companies’ ETR should take into account the fact that companies’ characteristics may or may not generate permanent differences.

With reference to previous studies, some of their findings are shown in Table 1. With no claim of being exhaustive, it shows the results of some studies, focusing on the characteristics of companies whose impact on the ETR is being investigated in this study. The other characteristics that have been investigated in previous studies are not taken into consideration in this study due to the unavailability of the necessary data. With reference to all the features shown in Table 1, the findings of previous

studies appear inconclusive. The research hypotheses tested in this study are developed as shown in the following.

Firm size

Two competing theories could explain the association between firm size and ETR. According to the “political cost theory” (Zimmerman, 1983), “larger firms are subject to more governmental regulations” and “they are politically more prone to public pressure and scrutiny, which forces them to act socially responsible and to adjust their actions and corporate behavior to what their social environment expects” (Belz et al., 2019). In line with this view, the firm size should positively affect the ETR. Conversely, according to the “political power theory” (Siegfried, 1972), “larger firms have lower ETRs because they have substantial resources available to them to manipulate the political process in their favor, engage in tax-planning and organize their activities to achieve optimal tax savings” (Richardson and Lanis, 2007). In line with this view, the firm size should negatively affect the ETR.

The fact that both of these theories suggest that the firm’s size has an impact on the ETR and that most of the previous studies have found that this impact, whether positive or negative, is statistically significant, leads to hypothesise that firm size should have an impact on ETR in the context of Italian private companies. However, there are not enough elements to hypothesise the sign of this impact.

Therefore, the research hypothesis that is tested is the following:

H_1 : *Firm size affects ETR.*

Asset mix

Tangible fixed assets

The association between investments in tangible fixed assets and ETR has been widely investigated. Previous studies have generally hypothesised that the former should have a negative impact on the ETR due to the fact that (1) tangible fixed assets are associated with amortisation which constitutes a deductible cost for tax purposes and (2) they are often encouraged through tax incentives (Gupta and Newberry, 1997; Richardson and Lanis, 2007). However, this way of justifying the existence of said association and the related (negative) sign appears to be open to criticism on at least two points.

First, when the ETR is measured as it is in this study, tangible fixed assets would affect the ETR only if they are related to costs (revenues) that constitute permanent

differences and these costs (revenues) are proportional to tangible fixed assets. Although the Italian tax legislation provides for cases of non-deductibility (non-taxable) of costs (revenues) related to tangible fixed assets (D. P. R. of 22nd December 1986, n. 917), the link between them and the magnitude of tangible fixed assets is not conceivable.

Second, any effect produced by any tax incentives attributed to companies to encourage the acquisition of tangible fixed assets should not be formulated generically. Rather, it should be referred to it if the tax legislation actually provides for it. However, in this case, its impact would not be associated with the magnitude of total tangible fixed assets. Rather, it would be associated with the magnitude of the tangible fixed assets that get the benefit. In this regard, the context investigated in this study allows us to better verify the relationships under examination. In fact, in the investigation timeframe (2016-2017), the Italian government introduced a tax benefit, the so-called “super-amortisation”, for companies that make certain types of investments in tangible fixed assets (Law 28th December 2015, n. 2008 and Law 11th December 2016, n. 232). In practice, companies can, through the amortisation process, deduct from their taxable base a cost for the tangible fixed assets that is higher than the purchase cost. For the purposes of determining the tax base, this generates a negative permanent difference; therefore, it would negatively impact on the ETR.

In light of all the aforementioned, the following research hypotheses are tested:

H_2 : In the presence of tax incentives that encourage the purchase of fixed tangible assets, if the effect of these incentives is controlled, tangible fixed assets do not affect ETR.

H_3 : In the presence of tax incentives that encourage the purchase of fixed tangible assets, increments of investments in tangible fixed assets negatively affects ETR.

Intangible fixed assets

The association between investments in intangible fixed assets and the ETR has been studied by some scholars (Chen et al., 2010), albeit infrequently, compared to other associations. In some studies, investments in intangible fixed assets have been considered along with investments in tangible fixed assets (Dias and Reis, 2018; Wang et al., 2014).

However, in Italy these investments may be a significant determinant of the degree of variability of the ETR. With reference to patents, the tax-deductible portion is 50% of their cost (art. 103 of the D. P. R. of 22nd December 1986, n. 917). With reference to goodwill, two

aspects must be noted. The first relates to the fact that the amortisation period prescribed by the Italian GAAP is different from the amortisation period prescribed by the tax legislation. However, this does not generate permanent differences. In fact, this generates only temporary differences; thus, it has no effect on the ETR. The second aspect concerns the deductibility of amortisation. The amortisation of goodwill is deductible only if the goodwill cost is tax-relevant (art. 103 and 176 of the D. P. R. of 22nd December 1986, n. 917), but this is not always the case. In fact, for the amortisation to be deductible, the company must pay a “special” tax. However, the amount of this tax could be considered too burdensome for the company. Consequently, the company could decide not to pay this tax, not giving tax relevance to the cost of goodwill. In this case, permanent differences are generated. In light of the aforementioned, the research hypothesis tested is as follows:

H₄: Intangible fixed assets do not negatively affect ETR.

Inventories

Some previous studies that have explored the impact of the asset mix on ETR have included inventory level as an explanatory variable (Adhikari et al., 2006; Derashid and Zhang, 2003; Gupta and Newberry, 1997; Noor et al., 2008; Richardson and Lanis, 2007; Salaudeen and Eze, 2018). Gupta and Newberry (1997) argue that given the tax benefits associated with capital investments, capital intensive firms should face a lower ETR and, to the extent that the investment in inventories is a substitute for the investment in tangible fixed assets, inventory intensive firms should face a relatively higher ETR.

In developing the previous H₂ and H₃ research hypotheses, it has been argued that the magnitude of investments in tangible fixed assets should not have an effect on the ETR. In addition, when the ETR is measured as in this study, inventories would affect the ETR only if there were related costs (revenues) that constitute permanent differences and they were proportional to the magnitude of inventories. The Italian tax legislation does not provide for cases of non-deductibility (non-taxable) of costs (revenues) related to inventories.

In light of the aforementioned, the research hypothesis tested is as follows:

H₅: Inventories do not affect ETR.

Investments in subsidiaries, affiliates, and other companies

The association between investments in subsidiaries, affiliates, and other companies and the ETR appears to

have been under investigated in literature. However, an analysis of Italian accounting and tax rules suggests that this association may exist.

Italian companies can account for (some of) these investments, adopting either the equity method – very rarely used – or the cost method. This implies that, when the investee company decides to distribute dividends, the investor company (that adopts the cost method) recognises them in the income statement. These dividends are taxed only for IRES purposes and only at a rate of 5% of their value (art. 89 of the D. P. R. of 22nd December 1986, n. 917). This implies that dividends generate a permanent difference for an amount almost equal to their value. In addition, dividends are IRAP-exempt revenues. Assuming that the higher the investments in subsidiaries, affiliates, and other companies are, the higher the amounts of dividends will be, and that the higher the amounts of dividends are, the higher the negative permanent differences will be, the research hypothesis tested is as follows:

H₆: Investment in subsidiaries, affiliates and other companies negatively affect ETR.

Leverage

According to most of the previous studies, the degree of indebtedness should have a negative impact on the ETR because it generates financial charges that are (usually) deductible costs. However, this is not completely true in the context of Italian companies.

The financial charges incurred in a given fiscal year are deductible costs for IRES purposes, within the limit set by the tax legislation (art. 96 of the D. P. R. of 22nd December 1992, n. 917). The part that exceeds this limit can be deducted in subsequent fiscal years if the conditions prescribed by the law are met. This part gives rise to deferred taxes and a deferred tax asset. However, the financial charges incurred in a given fiscal year are non-deductible costs for IRAP purposes. Therefore, considering how the ETR is measured in this study, financial charges would not have an effect on the effective IRES tax rate, but would have an effect on the effective IRAP tax rate. These considerations suggest the following research hypothesis:

H₇: Leverage positively affects ETR.

Profitability

With reference to the association, and to the relative sign, between firm profitability and ETR, two main contrasting strands of research have emerged in literature.

Most previous studies (Armstrong et al., 2012; Gupta and Newberry, 1997; Lazăr, 2014; Richardson and Lanis, 2007) have found a positive association. These scholars

usually justify the positive sign by arguing that the higher the profitability, the higher the amount of taxes paid by a company. This reasoning, however, is open to criticism. In fact, paying more taxes on profitability does not imply having a higher ETR. Equation 6 shows that the variability of the ETR depends on the sign and magnitude of permanent differences. The fact that a company is more profitable does not imply that it has lower, positive permanent differences or greater, negative permanent differences.

However, a few prior studies have found, instead, a negative association. These authors usually justify this negative association arguing that companies with higher

$$\text{ETR}_{it} = \beta_0 + \beta_1 \text{SIZE}_{it} + \beta_2 \text{TAN}_{it} + \beta_3 \Delta \text{TAN}_{it} + \beta_4 \text{INTAN}_{it} + \beta_5 \text{INV}_{it} + \beta_6 \text{ISA}_{it} + \beta_7 \text{DEBT}_{it} + \beta_8 \text{ROA}_{it} + \beta_9 \text{YEAR}_i + \beta_{10} \text{REGION}_{it} + \beta_{11} \text{SECTOR}_{it} \quad (7)$$

The meaning of the variables and the way they are measured are analytically shown in Table 2. The subscripts *i* and *t* refer to company *i* and financial year *t*, respectively.

The first eight variables of Equation 7 are related to the research hypotheses. The confirmation or the rejection of the research hypotheses depend on the sign and/or the statistical significance of the respective regression coefficient, as shown in Table 3. The remaining variables of Equation 7 are control variables. The variable YEAR is included to control for the effect of the financial year and the change in the standard IRES rate. As stated earlier, in fact, the standard IRES rate was 27.5% in 2016 and 24% in 2017. The variable REGION is included to control for the effect of the Italian region in which a company is located because the standard IRAP rate may vary from region to region. In addition, companies located in certain regions may have benefited from specific tax incentives. The variable SECTOR is included to control for the effect of the economic sector in which a company operates; in fact, the standard IRAP rate may also vary from one economic sector to another. In addition, companies operating in certain sectors may have benefited from specific tax incentives.

The sample of companies was extracted (on 2nd May 2019) from the AIDA database supplied by Bureau van Dijk; it is the largest database of financial statement data of Italian companies. The sample of companies was selected on the basis of the following criteria:

- (1) limited liability companies;
- (2) active companies;
- (3) private (unlisted) companies;
- (4) (non-consolidated) financial statements prepared in ordinary form according to Italian legislation and generally accepted accounting standards available for years 2017-2016-2015;
- (5) companies operating in economic sectors other than the financial one;
- (6) number of employees at least equal to ten so as to exclude micro enterprises (as defined by European legislation);
- (7) positive earnings before taxes.

The companies that reported losses (negative earnings before taxes) were eliminated because the interpretation of the tax burden in such cases would have been complex and questionable (Fernández-Rodríguez and Martínez-Arias, 2014; Omer et al., 1993; Richardson and Lanis, 2007; Wilkie and Limberg, 1993; Zimmerman, 1983).

profitability have more incentives and resources to put in place strategies for reducing the taxable base (Manzon and Plesko, 2001; Rego, 2003).

In light of the aforementioned, the research hypothesis tested is as follows:

H₆: Profitability affects ETR.

RESEARCH DESIGN AND SAMPLE SELECTION

To test the research hypotheses developed earlier, as in Derashid and Zhang (2003), Janssen (2005), and Richardson and Lanis (2007), a pooled cross-sectional OLS model is adopted, as follows:

The number of companies meeting the aforementioned selection criteria amounted to 23,180, corresponding to 46,360 firm-year observations. After making the deletions indicated in Table 4, the final observations totaled 41,672 (20,984 observations refer to the fiscal year 2016; 20,688 observations refer to the fiscal year 2017).

Table 5 shows the main descriptive statistics referring to the sample observations. Two aspects merit highlighting; by distinguishing the observations by fiscal year, the mean (median) value of the ETR (not tabulated) amounts to 0.3972 (0.3457) for fiscal year 2016 and 0.3617 (0.3107) for fiscal year 2017. Both the mean value and the median value of the ETR decreased by about 3.5% which corresponds exactly to the reduction in the standard IRES rate (from 27.5 to 24%).

With reference to firm size (SIZE), 50% of the observations reveal total assets of less than 14 million euros, while 75% of the observations show total assets of less than 28 million euros. These values show that the sample mainly consists of small- and medium-sized companies, which is the typical size of Italian private companies.

FINDINGS AND DISCUSSION

Table 6 shows the results of the correlation analysis. With reference to the correlation coefficients between the dependent variable and the independent variables, all of them are statistically significant. Their sign is negative (positive) with reference to the variables SIZE, TAN, ΔTAN, ISA, and ROA (INTAN, INV and DEBT). These results are not completely in line with the research hypotheses. In fact, with reference to SIZE, ΔTAN, INTAN, ISA, DEBT, and ROA, the association with the ETR has been hypothesised (regardless of its sign). Instead, with reference to TAN and INV, the non-association with the ETR has been hypothesised.

As concerns the correlation coefficients between the independent variables, none of them are of a magnitude that would suggest the presence of multi-collinearity problems. The calculation and analysis of the Variance Inflation Factors (VIF) (not tabulated) confirm that there are no multi-collinearity problems.

Table 2. Meaning and measurement of variables.

Variable	Meaning/Measurement
ETR	<i>Effective tax rate</i> , measured as the ratio between income tax (current, deferred and prepaid taxes) and earnings before income tax. When its value is negative (positive and greater than 1), it is assumed to be 0 (1).
SIZE	<i>Firm size</i> , measured as the natural logarithm of total assets at the end of the previous fiscal year.
TAN	<i>Incidence of tangible fixed assets</i> , measured as the ratio between tangible fixed assets (net of the respective accumulated depreciation and write-downs) of the fiscal year and total assets at the end of the previous fiscal year. <i>Change in incidence of tangible fixed assets</i> . It is differently measured depending on the reference year. With reference to 2016, it is measured as follows: $\frac{PPE_{2016} + DEP_{2016} - PPE_{2015}}{TA_{2015}}$
ΔTAN	With reference to 2017, it is measured as follows: $\frac{PPE_{2017} + DEP_{2017} + DEP_{2016} - PPE_{2015}}{TA_{2015}}$ In both cases, PPE is property, plant and equipment (net of the respective accumulated depreciation and write-downs), DEP is depreciation of property, plant and equipment, TA is total assets. The subscript refers to the fiscal year.
INTAN	<i>Incidence of intangible fixed assets</i> , measured as the ratio between intangible assets (net of the respective accumulated depreciation and write-downs) of the fiscal year and total assets at the end of the previous fiscal year.
INV	<i>Incidence of inventory</i> , measured as the ratio between inventories of the fiscal year and total assets at the end of the previous fiscal year.
ISA	<i>Incidence of investments in subsidiaries, affiliates and other companies</i> , measured as the ration between lasting investments in subsidiaries, affiliates and other companies different from them of the fiscal year and total assets at the end of the previous fiscal year.
DEBT	<i>Level of indebtedness</i> , measured as the ratio between debts of the current fiscal year and total assets at the end of the previous fiscal year.
ROA	<i>Firm profitability</i> , measured as the ratio between earnings before taxes of the fiscal year and total assets at the end of the previous fiscal year.
YEAR	Dummy variable that holds a value of 1 if the fiscal year of reference is 2017, of 0 otherwise.
REGION	Set of 19 dummy variables based on the region a company is located in (the base case is the region where the highest number of companies is located). Italy is administratively divided into twenty regions.
SECTOR	Set of 67 dummy variables based on the two-digit ATECO 2007 codes (the Italian system of classification of economic sectors). The base case is the economic sector that the highest number of companies belongs to.

Table 7 shows the results of the regression analysis. The regression coefficient of SIZE is statistically significant. Thus, the related research hypothesis (H_1) is confirmed. It is negative and therefore, the larger the company, the lower the ETR. This result is in line with Irianto et al. (2017), Janssen (2005), and Richardson and Lanis (2007). It supports the “political power theory” (Siegfried, 1972). However, considering the dimensional characteristics of the observations of the sample, it is not believed that larger companies have substantial enough

resources available to them to manipulate the political process. Rather, it is believed that they have the resources to engage in tax-planning and to organise their activities so as to achieve optimal tax savings. The result differs from that obtained by Parisi (2016) who investigated the impact of firm size on the ETR in a sample of Italian private companies for the 1998-2006 time period and found that it was statistically significant and positive. In accordance with Gupta and Newberry (1997), the inconsistent results suggest that firm-size

Table 3. Summary of the research hypotheses.

Variable	Expected sign and/or statistical significance of the regression coefficient
SIZE	+ or -
TAN	No statistical significance
Δ TAN	-
INTAN	+ or no statistical significance
INV	No statistical significance
ISA	-
DEBT	+
ROA	+ or -

Table 4. Sample company process.

Parameter	Companies	Firm-year observation
Initial observations, according to the selection criteria	23,180	46,360
Observations with incomplete or invalid data	-	-369
Observations with outlier value	-	-4,183
Observations of sectors represented by less than thirty observations	-	-136
Final observations	-	41,672

With reference to the variables SIZE, Δ TAN, and ROA, an observation with a value below the first percentile or above the ninety-ninth percentile is considered as outlier. With reference to the variables TAN, INTAN, INV, ISA, and DEBT, an observation with a value above the ninety-ninth percentile is considered as outlier.

Table 5. Descriptive statistics (continuous variables).

Variable	Mean	Standard deviation	Median	Min	Max
ETR	0.3796	0.1917	0.3299	0	1
SIZE	16.5685	1.0136	16.4506	13.5958	20.0695
TAN	0.2011	0.1837	0.1517	0	0.8591
Δ TAN	0.0493	0.0716	0.0228	-0.0764	0.5190
INTAN	0.0276	0.0543	0.0067	0	0.4263
INV	0.1896	0.1768	0.1520	0	0.8702
ISA	0.0279	0.0698	0.0005	0	0.5313
DEBT	0.2052	0.1846	0.1752	0	0.7599
ROA	0.0766	0.0757	0.0516	0.0017	0.4542

Definitions of variables in Table 2.

effects could be sample-specific and not likely to exist over time in firms with longer histories.

The regression coefficient of TAN is not statistically significant, whereas Δ TAN is statistically significant and negative. Thus, the related research hypotheses (H_2 and H_3) are confirmed. The result concerning the first variable is in line with Delgado et al. (2018), Irianto et al. (2017), Liu and Cao (2007). Most previous studies (Gupta and Newberry, 1997; Richardson and Lanis, 2007) that did not directly control for the effect of tax benefits envisaged to incentivise the investment in tangible fixed assets

initially hypothesised and later found that a statistically significant and negative association exists between the incidence of tangible fixed assets and the ETR. This justifies the statistical significance and the sign of this association by the fact that (1) the amortisation of tangible fixed assets is a deductible cost for tax purposes and (2) the investment in tangible fixed assets is often incentivised by tax benefits. Parisi (2016) is included among this group of studies. It has been highlighted that the mere fact that the aforementioned amortisation is a deductible cost for tax purposes is not a valid theoretical

Table 6. Correlation analysis.

Correlation	ETR	SIZE	TAN	Δ TAN	INTAN	INV	ISA	DEBT	ROA
ETR	1.0000*								
SIZE	-0.1362*	1.0000*							
TAN	-0.0299*	0.0926*	1.0000*						
Δ TAN	-0.1632*	0.0034*	0.5324*	1.0000*					
INTAN	0.0953*	-0.0004*	-0.0408*	0.1068*	1.0000*				
INV	0.0208*	0.0516*	-0.1037*	-0.0354*	0.0262*	1.0000*			
ISA	-0.0533*	0.2754*	0.0537*	0.0155*	0.0732*	-0.0113*	1.0000*		
DEBT	0.1671*	0.0124*	0.2558*	0.1300*	0.1405*	0.2294*	0.1761*	1.0000*	
ROA	-0.4104*	-0.0140*	-0.1249*	0.1240*	-0.0685*	-0.1086*	-0.0697*	-0.3646*	1.0000*

Definitions of variables in Table 2. The Spearman's correlation coefficients have been calculated because all the variables are not normally distributed. *Indicates significance at 5%.

Table 7. Regression analysis.

Variable	Coefficients	Robust standard errors	t	P> t	[95% confidence interval]	
Constant	0.7512	0.0160	47.096	0.0000	0.7199	0.7825
SIZE	-0.0178	0.0009	-18.777	0.0000	-0.0196	-0.0159
TAN	-0.0091	0.0066	-1.373	0.1697	-0.0220	0.0039
Δ TAN	-0.2044	0.0144	-14.236	0.0000	-0.2325	-0.1763
INTAN	0.2180	0.0197	11.104	0.0000	0.1800	0.2572
INV	-0.0219	0.0064	-3.395	0.0007	-0.0345	-0.0093
ISA	-0.2195	0.0144	-15.194	0.0000	-0.2478	-0.1912
DEBT	0.0783	0.0056	14.013	0.0000	0.0674	0.0893
ROA	-0.7234	0.0118	-61.245	0.0000	-0.7465	-0.7002
YEAR			Included			
REGION			Included			
SECTOR			Included			
Observations	41,672					
F(95, 41,576)	92.33					
Prob > F	0.0000					
Adjusted R ²	0.1748					

Definitions of variables in Table 2.

justification for a negative association between the incidence of tangible fixed assets and the ETR, at least in the case in which ETR is measured following the method used in this study. It has also been pointed out that the effect produced by the tax benefits envisaged to incentivise investments in tangible fixed assets should be considered if they are actually envisaged and in the terms in which they are envisaged. The results of this study show that, if an independent variable capable of measuring, at least approximately, the aforementioned incentives is introduced in the regression model, the incidence of tangible fixed assets loses statistical significance, while the variable that approximates the aforementioned incentives is statistically significant and negative. If Δ TAN had not been included in the regression model used in this study, the regression

coefficient of TAN would have been statistically significant and negative as in most previous studies. The results of this study, therefore, suggest that greater caution should be used in the development of the research hypothesis on the significance and sign of the association between the incidence of tangible fixed assets and the ETR.

The regression coefficient of INTAN is statistically significant and positive. Thus, the related research hypothesis (H_4) is confirmed. This means that the higher the investment in intangible fixed assets is, the higher (in absolute value) the positive permanent differences are. Considering that the magnitude of investments in intangible fixed assets is usually positively associated with the magnitude of goodwill recorded on the balance sheet and considering the tax rules in force in Italy, this

result could mean that companies have not found it convenient to recognise, for tax purposes, the cost of goodwill. As stated earlier, some previous studies (Dias and Reis, 2018; Wang et al., 2014) added investments in intangible fixed assets together with investments in tangible fixed assets, to make a single and overall variable in the regression model. Had this been done the same way in this study (and Δ TAN had not been included in the regression model), the regression coefficient of TAN would have been statistically significant and negative, but its magnitude, in absolute value, would have been less than when INTAN is included separately. In this case, in fact, the regression coefficient of TAN would have reflected the contrasting effects produced by TAN and INTAN on the ETR.

The regression coefficient of INV is statistically significant and negative. Thus, the related research hypothesis (H_5) is rejected. This result contrasts with both the research hypothesis developed in this study (no association) and with that most frequently found in previous studies (positive association) (Gupta and Newberry, 1997; Parisi, 2016; Richardson and Lanis, 2007). Recently, Stamatopoulos et al. (2019), exploring the determinants of the variability of the ETR in Greek companies, have found a statistically significant and negative association between the ETR and INV. According to them, "it is reasonable to expect that if inventory grows faster than sales, a price reduction will follow leading to lower sales revenue and income and consequently to lower tax" (Stamatopoulos et al., 2019: 246). This justification rests on the assumption that the lower the profitability of the company is, the lower the ETR will be. However, as will be shown subsequently, this assumption is not reflected in the context investigated in this study. In addition, in order to control for the robustness of the results of this study, double-clustered standard errors (by region and economic sector) have been computed in order to account for within-cluster correlation and heteroscedasticity (results are not tabulated). With this different way of calculating standard errors, the only variable that lost statistical significance was INV. With the different way of calculating standard errors, therefore, the regression coefficient of INV is not statistically significant, in line with the related research hypothesis (H_5). The findings relative to INV, therefore, should be interpreted with caution and the association under examination requires further research.

The regression coefficient of ISA is negative and statistically significant. Thus, the related research hypothesis (H_6) is confirmed. To the best of our knowledge, this study is the first to investigate the type of association under consideration. This result confirms the fact that the search for determinants of the variability of the ETR should be more focused on the characteristics (the fiscal system, in particular) of the context under investigation.

The regression coefficient of DEBT is positive and

statistically significant. Thus, the related research hypothesis (H_7) is confirmed. This result is in line with Harris and Feeny (2003), Janssen (2005), and Wang et al. (2014). It confirms the fact that, when the ETR is measured as the way it is in this study, indebtedness can influence the ETR when it generates cost (or revenue) elements that constitute permanent differences, as in the Italian case, and not merely because the financial charges are deductible costs for tax purposes. This result is different from that obtained by Parisi (2016), who found a statistically significant and negative association. The inconsistency between the results could depend on the different tax rules regarding the deductibility of the financial charges in force in the two time periods under investigation (2016-2017 in this study; 1998-2006 in the other study).

The regression coefficient of ROA is statistically significant and negative. Thus, the related research hypothesis (H_8) is confirmed. This result is in line with Adhikari et al. (2006), Iranto et al. (2017), Kraft (2014), Noor et al. (2008), and Parisi (2016). As suggested by Manzon and Plesko (2001) and Rego (2003), this result could be justified by arguing that companies with higher profitability have more incentives and resources to put in place strategies for reducing their taxable base.

With reference to YEAR, the analysis has shown that the regression coefficient is negative and statistically significant. This result is consistent with the fact that, as mentioned earlier, the standard IRES rate was reduced (from 27.5 to 24%).

With reference to REGION, the analysis has shown that the regression coefficient is statistically significant (at the 5% level) for 11 of the 19 dummy variables included in the regression model (results not tabulated). This result can be explained by the fact that the standard IRAP rate can vary from region to region and there may be tax incentives to support the establishment and development of entrepreneurial activities in certain regions. This result suggests that the tax burden is not equally distributed among the regions. A similar result was found by Vandebussche et al. (2005) with reference to Belgium. However, as regards the Italian context, this aspect requires further and specific research.

With reference to SECTOR, the analysis has shown that the regression coefficient is statistically significant (at the 5% level) for 33 of the 67 dummy variables included in the regression model (results not tabulated). As with reference to REGION, this result can be explained by the fact that the standard IRAP rate can vary from economic sector to economic sector and there may be fiscal benefits that favor specific economic sectors. This result suggests that the tax burden is not equally distributed even among the economic sectors. Nevertheless, this aspect also needs additional and targeted research.

The coefficient of determination of the linear regression model appears to be low, although it is in line with those found in some previous studies and the model has

included the main independent and control variables that have generally been used in previous studies. This means that the percentage variation in the ETR, which is explained by all the independent and control variables together, is low. In addition, although most of the relationships found have very high statistical significance, the relative effect size of most determinants appears to be scarcely significant in substantial terms. This suggests that the line of research on the determinants of the ETR, with reference to Italy but also to other countries of the world, requires further attention by researchers.

Conclusion

The study has shown a statistically significant and negative (positive) association between ETR and firm size, investment in tangible fixed assets, inventory, investments in subsidiaries, affiliates, and other companies, and firm profitability (intangible fixed asset and firm indebtedness). Conversely, it has shown no statistically significant association between ETR and tangible fixed assets. The study has also shown that companies' ETR is affected by the financial year of reference, the region where they are located, and the economic sector to which they belong.

By focusing on Italian private companies, the study extends the scope of investigation on the determinants of the ETR to both a geographical context (Italy) and to companies (private companies) that have been the object of scant attention in previous studies. Italian public policy-makers and Italian and non-Italian economic operators can benefit from the results of the study in order to make more informed future decisions.

The study highlights the importance of paying more attention to the specificities of the investigated context when formulating research hypotheses on the associations between the ETR and the specific characteristics of companies.

LIMITATIONS

The present study is not without limitations, the most significant of which is related to the way some independent variables have been measured. This is particularly relevant for the variable Δ TAN. It has been included to observe the impact of the tax benefit linked to investments in tangible fixed assets. However, the tax benefit applies only to certain types of investments. Because of the lack of data that would be necessary to measure only these investments, Δ TAN measures the total investments. As a result, the findings should be interpreted with caution.

FUTURE RESEARCH

Two main future research paths can be envisaged. The

first one is suggested by the low level of the coefficient of determination of the regression model obtained in this study. In this regard, as in the main previous studies, the characteristics of companies have been measured using variables constructed on the basis of balance sheet data. However, they could be measured using variables constructed on the basis of income statement data. For example, the effect of the level of indebtedness has been verified using the incidence of debts on total assets, assuming that the higher this incidence is, the higher the amount of financial charges recorded in income statement will be. However, the effect of the level of indebtedness could be verified using the incidence of financial charges on an appropriate parameter in the income statement. In fact, the first measure may fail to fully and correctly capture the magnitude of the permanent difference which, as shown earlier, is the real cause of the variability of the ETR. Similar considerations can be extended to the other characteristics of the companies investigated in this study. The second future research path is related to the reduction in the standard tax rate that occurred in Italy. There are few studies in literature that have investigated what happens in this case and whether the lowering of the standard tax rate actually results in a lowering of the effective tax rate.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Full Length Research Paper

The impact of geographical location on inclusion of small and medium enterprises in the mining global value chain in Zambia: A case of selected small and medium enterprises (SMES) in the mining area

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The global value chain approach has become a useful strategy to reduce poverty in the mining area by forming linkages among various players. This approach gives an opportunity to all stakeholders to participate in any suitable activity along the value chain. Once small and medium enterprises (SMEs) enter the value chain, they supply and earn sustainable income. Unfortunately, geographical location of the mines acts as a barrier for SMEs to supply their goods and services. The geographical location comes with a challenge for both urban and rural based SMEs to access the mines due to poor roads and expensive electricity infrastructure. The main objective was to examine the impact of geographical location on inclusion of SMEs in the mining global value chain. The global value chain literature focusing on challenges that SME face to supply to the mines was reviewed to give insight on how these barriers affect SMEs participation. A random sampling was conducted among the SMEs whose age ranges from below 20 to above 40 from the mining area to determine the extent to which geographical location affects their inclusion to supply to the mines. Findings show that SMEs below the age of 30 are greatly affected to supply to the mines. In addition, rural based SMEs who are the majority had greater challenges to supply to the mines due to poor road and expensive electricity infrastructure. The female genders were also affected with the geographical factors. The study recommends that the government through Road Development Agency as well as the Ministry of Energy constantly repair the roads and improve energy sources, respectively so that SMEs can afford to access the mines services.

Key words: Electricity and road infrastructure barriers, small and medium enterprises, mining global value chain.

INTRODUCTION

The mining sector has become lucrative in engaging local small and medium enterprises (SMEs) to participate in

the mining global value chain. The global value chain (GVC) covers the full range of activities performed by

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various firms to bring a product from its inception to the end user and beyond (OECD, 2013a, b). The cost-benefit analysis of participating in the mining global value chain has become crucial for researchers and policy makers, and it has become apparent that most governments promote the engagement of SMEs in the chains (IFC, 2002; Hoermann et al., 2010). In South America as well as Malaysia, research shows that there are beneficial effects for SMEs to participate in the mining value chain as they earn sustainable income (IFC, 2002; Ata et al., 2013). A recent survey carried out on the Zambian SMEs in most of the economic sectors (Chibwe, 2008) reveals that SMEs continue to stagnate in growth due to inherent barriers such as tax, licensing, registration process, financial and skills barriers. Although the study for Chibwe (2008) recommended setting up a one stop shop to overcome registration and process barriers, and offering tax incentives to local SMEs; the study did not discuss geographical location barriers and how to overcome them. In addition, OECD (2009) discusses top barriers for SMEs internationalization but never mentioned of geographical location barriers that SMEs face to supply to the mines. In the study, geographical barriers focus on the distance of the mines in relation to the SME accessibility and the lack of electricity for households around the mines which is a common factor for most mines in Zambia. Most mines in Zambia are located far away from the central districts and some SMEs have made some settlement closer to mines in a bid to access the high grade markets.

The Zambian SMEs will continue to live in poverty unless a complete set of barriers are identified and necessary action taken. This study is set to examine how geographical location affects SMEs in the mining value chain. Geographical location will focus on the state of roads, state of electricity and the distance to the mines (Peters and Hertwich, 2008). The relationship between geographical location and SME inclusion to the mines has not been reported in the Zambian academic papers as well as policy reports. It is argued that geographical distance from key trading partners affects both urban and rural based SMEs (Peters and Hertwich, 2008), but it is not clear how this problem affects SMEs in Zambia. In addition, the geographical location of the mines in most cases is faced with the problem of un-serviced roads as there is little government mandate to repair the roads leading to the mines. The poor roads affect mobility of SMEs in the mining value chain and increases their transportation cost but it is not clear how this affects the Zambian SMEs. Electricity cost too have been very high affecting SMEs potential for their production technologies but it is not clear how this affects the Zambian SMEs in the mines.

This study, henceforth, responds to the research objective regarding the geographical location affecting SMEs to supply to the mines. The research process begins with a review of the available literature to gain

insight on how the geographical location affects SMEs in the global value chain. Thereafter, the research methodology is explained and its rationale behind the selection of methods. The research presents findings based on primary data collected from SMEs around the mining areas and is registered by the mining suppliers and contractors association of Zambia and supplemented by secondary sources. Finally, the main findings are discussed to flag way for conclusions, implications and recommendations.

LITERATURE REVIEW

In this study, GVC theory is being used to gain insight in the relationship between commercial activities and SMEs integration to the activities. The theory specifically focuses on the role of GVC in international networks of companies for a win-win situation. Alongside the GVC theory, the study also uses the geographical location theory (Weber, 1909) which contends that SMEs close to other economic agents have easy access to external resources and reduced transportation costs. This means that it is logical that firms choose locations that maximize their profits but unfortunately this is a difficult decision for SMEs located in distant locations. Further, the use of Marshall (1920) theory which stresses the benefits of location advantage helps to understand why SMEs choose business locations that form better and cheaper interaction between them. Most firms' location choices may create competitive advantage by improving access to key resources as failure to have SME support for agglomeration; SMEs continue to be marginalized (Johansson and Forslund, 2006). However, the benefits of agglomeration ultimately reflect gains when proximity reduces transport costs. Co-location has been used as a strategy help cluster SMEs and creates synergy in a quest to improve SME connectivity to the global value chain. Overall, the ideologies of global value chain, geographical location theories and location advantage help to position SMEs in a win-win situation among various stakeholders. This implies integration of various SMEs that mutually benefit from each other's proximity. While the GVC theory advocates for providing linkages among various stakeholders for a win-win situation, the geographical location of the mining value chain drawback SMEs (Cattaneo et al., 2013; OECD, 2013a). Most SMEs are located geographically far from commercial activities and linking them to the global value chain may be limiting. In addition, energy sources have not only been unavailable but the tariffs are also beyond SMEs payment ability.

The geographical location of the global value chains may pose as barriers to SME to supply to the mines. The location may impact the competitiveness of the global mining value chain when located too far from its high-value markets. There are also limitations to certain

regions due to lack of supporting infrastructure, resources, knowledge and capabilities which may enable or constrain value chain upgrading (Trienekens, 2011: 54-56). Some regions may lack reliable energy and water resources which are cardinal factors that drive cost competitiveness in capital-intensive assembly. It has been stressed by OECD, WTO and World Bank (2014: 24) that there are cost and quality implications for fragmented production as this means that inputs and intermediate goods must be transported between multiple locations. The efficient logistics lower costs for SMEs while structural difficulties are encountered by SMEs in remote areas. The effective approaches require supporting countries in designing and implementing tailored solutions that are able to meet specific needs. In addition, Hernández et al. (2014: 178) emphasized that efforts to promote economic integration need to take account of many different factors including regional policy.

On one hand, the theory of geographical location as a determinant of SME participation in the supply chain dates back to the 1900s when Weber (1909) underpinned the hypothesis that suppliers and financial providers close to other economic agents have easy access to external resources and reduced transportation costs. Further, Marshall (1920) theorizes that the external economies perspective states that business location triggers different forms of interaction between firms and firms and their environment. On the other hand, the poor quality of electricity supplies in many developing countries is perceived by SMEs to impact their operations negatively. Voltage fluctuation and power outages can halt production, damage equipment and affect product quality. Enterprise development organizations, similarly, often regard insecure electricity supplies to be a serious constraint on SME development and expansion. The impact of the quality of electricity supply on firm productivity is less well understood. Infrastructure quality overall has a significant impact, at least as important as factors such as crime and access to finance, and unreliable electricity supply seems to be the infrastructure element with the strongest negative effect on enterprise productivity, especially in Africa (Escribano et al., 2009). Electricity insecurity tends to negatively affect the total factor productivity and labour productivity of manufacturing SMEs. World Bank (2010) stressed that electricity access for SMEs in African economies is limited. The impact of electricity insecurity on productivity varies depending on factors related to both the external context that a firm operates in and its internal capabilities (Cissokho and Seck, 2013). In addition to the absence of electricity infrastructure in rural based SMEs, Moyo (2012) stressed that power outages appear to affect SMEs more than multinational enterprises. The duration of outages has far greater negative impact on firm productivity than the frequency of outages.

As regards road infrastructure, most SMEs in various

sectors of the economy especially in the mines are negatively affected by poor transport in the aspect of input supply and consumer markets. This negative effect is a consequent of having un-serviced available routes which in turn increases unit costs of doing business (Goedhuys and Sleuwaegen, 2010). Road infrastructures enhance “ease of access to physical resources such as communication and transportation whose price does not discriminate against SMEs” (Porter et al., 2002). In addition, GEM Global Report (2010) found physical infrastructure and commercial infrastructure as most important conditions that drive entrepreneurship in factor-driven economies, especially when most SMEs are involved in primary production and occupy a small part of the value chain. The access into the global value chain requires substantial investments in sustainable physical infrastructure such as road and electricity and therefore continued partnerships between stakeholders to implement supportive measures yields improved outcomes.

In respect to electricity energy which is by far the most important obstacle that most businesses in Africa experience (Kaseke and Hosking, 2013), most SMEs find it very expensive to acquire the commodity. Lack of electricity supply as well as reliance on electricity with growing energy demand has driven up prices. The cost of electricity in sub-Saharan Africa is high (Ndulu et al., 2007). In addition to a critical lack of investment in energy production, investment in transmission lines has been lagging severely affecting the cost of energy and its availability at a lower cost (Kaseke and Hosking, 2013; Adenikinju, 2005). In addition, the frequent power outages slow down economic activities (Yepes et al., 2008). Moreover, most SMEs have continued to face stiff competition from the multinationals in accessing energy. In times of power outages, larger companies invest in diesel aggregates as alternative source of energy increasing production cost (Escribano et al., 2009; Peters et al., 2011). According to Aterido et al. (2011), improving access to electricity requires heavy investments in electricity production and transmission coupled with better regulation and public involvements which is out of reach of SMEs. However, there has been suggestions by Molina-Moreno et al. (2018) on the use of renewable energy in both rural and urban areas where there is lots of the biodegradable fraction of agricultural products, waste and residues including plant and animal substances, forestry, and related industries, as well as the biodegradable fraction of municipal and industrial waste. Messineo et al. (2012) indicated that most European countries are striving towards the development and use of energy from renewable sources, with the objective of a final gross consumption of renewable energy of 75% in 2050, reaching 97% in the future. This implies the reduction in the use of coal and unreliable water for power generation. In addition, there will be no loss of power for productivity as well as transforming

communities to innovation, competitiveness and sustainability

METHODOLOGY

In the quest to improve the understanding of the geographical locational barriers that SMEs face to supply to the mines in Zambia, a positivist paradigm was adopted. The main variable in the study includes: road, electricity and location distance. The adoption of this approach is in line with the epistemological orientation in the normative paradigm in order for the results to be subjected to scientific means (Creswell, 2014; Saunders et al., 2009). In response to the main proposition, a cross-sectional survey research was utilized to obtain quantitative data and estimate a population covariance matrix that was compared with the observed covariance matrix with a view to minimize the difference between the estimated and observed matrices. The respondents selected were the SMEs who are members of the mining suppliers and contractors association of Zambia. These are easily accessible during their monthly, quarterly, and yearly meetings. This study then adopted a global value chain theory which breaks down the variables under discussion and makes it easier to collect and analyze relevant data. The analysis of the global value chains is central to policy implementers to identify areas for intervention in the chains. In line with the positivist paradigm which demands to collect primary data through quantitative methods, a standardized questionnaire was developed for quantitative data.

Selecting samples

The selection criteria were done to ensure adequate representation of all segments of the mining global value chain in Zambia. The study considered suppliers who have been registered with the mining suppliers and contractors association of Zambia and are well familiar with the complexities of the mining value chain. The sampling method was simple random for quantitative data to ensure that everyone has equal opportunity of being selected. The total number of respondents selected was 350 out of 600 who participated in the study

Data collection

Primary data collection was done over a period of 6 months starting October 2018 to the end of April 2019. This study used standardized questionnaires which were completed by respondents through a cross section survey. In designing the questionnaire for the study, the development process proposed by Neelankavil (2015) was used. It involves clarifying objectives and research questions and interpreting them into specific needs, developing questions to address each information need, re-evaluating the wording of the questions, reworking the questions to elicit interest of respondents, arranging the questions to produce a logical sequence, improving style and presentation and finally pretesting the questionnaire. The internal consistency method as estimated by the Cronbach's alpha was used to measure reliability. This measure is very important as it reveals the similarity of items in the instrument that is used to tap the constructs. To avoid discrepancies in the answers, some follow-ups were conducted. Further, to improve the validity, a desk review was done using current literature to assess the collected data

The process of data collection resulted into delivery of 600 questionnaires to the respondents. There was a pen, a calendar and small diary for them to use. These items were proposed to be retained for the respondents after answering the questionnaire as a

token of appreciation as well as offering them convenience in answering the questionnaire while acknowledging the conflict nature of respondent incentive. The respondents were sent a friendly reminder after two (2) weeks and this strategy worked very well as 350 questionnaires were returned. Further, the researcher checked the questionnaire for correct answering upon receiving them. Thereafter, the questionnaires were numbered for easy identification for future review. The data was loaded into an Excel software package after which it was transferred into the IBM SPSS software package for subsequent analysis

Data analysis

Firstly, questionnaire items were measured using the "five-point Likert scale from 1 to 5" rating, with choices from "strongly disagree" to "strongly agree". Secondly, a descriptive statistic was performed to determine the levels of agreements on whether road infrastructure, electricity and locational distance affected SMEs to supply to the mines. Thirdly, a cross-tabulation was done between gender and geographical barriers, age and geographical barriers to determine how each of the variables (age and gender) is affected by the geographical location to supply to the mine. Fourthly, a multiple regression analysis was done to determine if geographical location is a predictor of SME inclusion in the mining global value chain. The researcher used Microsoft excel to develop a data sheet then transferred it into the IBM SPSS statistical package. In addition, data was reviewed several times for the purpose of cleaning against possible errors and omissions.

Questionnaire response rate

A total of 400 out of 600 suppliers completed and returned the questionnaires. There were 50 badly answered questionnaires. The useable questionnaires were 350 giving us a response rate of 58% of the total sample of the identified mining global value chain suppliers. This sample was adequate for the study.

Statistical analysis

In the study, Cronbach's alpha was used to check the reliability of the questionnaire items. Cronbach's alpha allows the estimation of consistency in the questionnaire items (Hair, 2010). It ranges from 0 to 1 with those alpha coefficients closest to 1.0 revealing highest internal consistency on the items. However, values above 0.6 can be accepted as posing satisfactory item reliability (Hair, 2010). Table 1 shows the Cronbach's alphas for the items used in this study.

Descriptive statistics

The descriptive statistics on the state of the roads and the cost of electricity show the different levels of responses from the SMEs. The statistics show responses on the state of the roads and the cost of electricity respectively and how they affects SMEs in the mines. The responses were drawn from the ordinal scale which is a universal method of collecting data, it is easy to understand and draw conclusions, reports, results and graphs from the responses. Table 2 shows responses on the state of road infrastructure to the mines and how they affect SMEs to supply. SMEs were asked to choose on the levels of agreement and out the 350 respondents, 49 (14%) strongly disagreed, 105 (30%) disagreed, 46 (13.1%) neutral, 63 (18%) agreed and 87 (24.9%) strongly agreed. This shows that the state of road infrastructure could not enhance SMEs'

Table 1. Cronbach's alpha for the items used in this study.

Reliability statistics	
Cronbach's alpha	No. of items
0.608	9

Table 2. Descriptive statistics on how the state of roads affects SMEs.

Variable	The state of roads to the mines support SMEs to supply to the mines				
	Frequency	Percent	Valid percent	Cumulative percent	
Valid	Strongly disagree	49	13.9	14.0	14.0
	Disagree	105	29.8	30.0	44.0
	Neutral	46	13.1	13.1	57.1
	Agree	63	17.9	18.0	75.1
	Strongly agree	87	24.7	24.9	100.0
	Total	350	99.4	100.0	-
Missing	System	2	.6	-	-
Total		352	100.0	-	-

Table 3. Descriptive statistics on how the cost of electricity affect SMEs

Variable	The cost of electricity is supportive for SME business development to the mines				
	Frequency	Percent	Valid percent	Cumulative percent	
Valid	Strongly disagree	63	17.9	18.0	18.0
	Disagree	81	23.0	23.1	41.1
	Neutral	84	23.9	24.0	65.1
	Agree	83	23.6	23.7	88.9
	Strongly agree	39	11.1	11.1	100.0
	Total	350	99.4	100.0	-
Missing	System	2	0.6	-	-
Total		352	100.0	-	-

competitiveness to supply to the mines as shown by the majority.

Table 3 shows how the responses on cost of electricity and how it affect SMEs to supply to the mines. The assumption regarding electricity was supportive enough to empower SMEs to supply to the mines. Out of 350 respondents, 63 (18%) strongly disagree, 81 (23.1%), 84 (24% neutral), 83 (23.7%) agree and 39 (11.1%) strongly agree. This means that electricity infrastructure act as barriers for SMEs to supply to mines as most respondents assent to it as a barrier.

CROSS TABULATION

Gender and geographical barrier

Table 4 shows a cross-tab of gender and geographical barriers to inclusion in the mining global value chain shows that out of 350 respondents 260 SMEs were of male gender and the rest 90 were female. 94 male (26.85%) were reported as not affected by geographical

location to supply to the mines while 110 (34.28%) were greatly affected by geographical barriers. On the other hand, only 33 (9.42%) female gender out of the total respondents indicated that geographical barriers did not affect them to supply to the mines while the majority of the female gender with 46 (13.14%) respondents were greatly affected to supply to the mines. The rest of the male and female were neutral and did not indicate whether they were affected or not. This means that geographical location in terms of accessibility to the mines with poor road infrastructure and higher cost of energy sources impedes SMEs participation.

Location barriers

Table 5 shows the location where SMEs reside include urban and rural areas, and the crosstab was done

Table 4. Gender x Geographical locational barriers cross-tabulation.

Variable			Geographical barriers have greatly affected my inclusion to supply to the mines					Total
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Gender	Male	Count	31	63	46	55	65	260
		% within geographical barriers	77.5	72.4	80.7	73.3	71.4	74.3
	Female	Count	9	24	11	20	26	90
		% within geographical barriers	22.5	27.6	19.3	26.7	28.6	25.7
Total	Count	40	87	57	75	91	350	
	% within geographical barriers	100.0	100.0	100.0	100.0	100.0	100.0	

Source: Field Study (2019).

Table 5. location area x Geographical locational barriers cross tabulation.

Variable			Geographical barriers have greatly affected my inclusion to supply to the mines					Total
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
location area	Urban area	Count	4	16	18	24	6	68
		% within geographical barriers	10.0	18.4	31.6	32.0	6.6	19.4
	Remote area	Count	36	71	39	51	85	282
		% within geographical barriers	90.0	81.6	68.4	68.0	93.4	80.6
Total	Count	40	87	57	75	91	350	
	% within geographical barriers	100.0	100.0	100.0	100.0	100.0	100.0	

to determine which of the locational areas affected SME inclusion in the mining value chain. Whereby (68)19.4% of the SMEs in the study live in urban areas, 282 (80.6%) of them live in remote area. The findings as shown in the crosstab indicate that 136 (38.8%) of the total respondents are rural based and greatly affected by geographical barriers to supply to the mines. 30 (8.57%) of the total respondents are urban based and are affected by the geographical location while 20

(5.71%) are not. This means that the SMEs who live in remote areas are greatly affected by geographical barriers to supply to the mines.

Age and inclusion

Table 6 show a cross-tabulation between age and inclusion was done and among the 350 SMEs who participated in the study, 28 were under the

age of 20; 117 respondents were between the ages of 21 to 29; 111 ranging 30 to 39 and the rest 94 were above 40. This means most SMES are in the ages between 21 and 39. In addition, the SMEs below 20 years of age show that 24% of them do not have problems to supply to the mine and 17% face many difficulties to supply due to geographical barriers. Overall, 166 respondents experience great barriers to supply to the mines while 127 do not have difficulties to supply. This

Table 6. Age x Geographical locational barriers cross-tabulation.

Variable		Geographical barriers have greatly affected my inclusion to supply to the mines					Total	
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree		
Age	under 20	Count	9	2	3	8	6	28
		% within geographical barriers	22.5	2.3	5.3	10.7	6.6	8.0
	21-29	Count	13	31	14	18	41	117
		% within geographical barriers	32.5	35.6	24.6	24.0	45.1	33.4
	30-39	Count	12	29	16	26	28	111
		% within geographical barriers	30.0	33.3	28.1	34.7	30.8	31.7
	over 40	Count	6	25	24	23	16	94
		% within geographical barriers	15.0	28.7	42.1	30.7	17.6	26.9
	Total	Count	40	87	57	75	91	350
		% within geographical barriers	100.0	100.0	100.0	100.0	100.0	100.0

means that despite the different age distribution, most SMEs experience difficulties to supply to the mines

Multiple regression

A regression analysis was carried out to identify whether state of road or electricity impact on SME inclusion to supply to the mines. This analysis was also done to determine which of those factors mattered most, which factors can be ignored, and how these factors influence each other.

Table 7 shows the model summary with Multiple R of 71.7%. This means that there is a 71.7% correlation between the independent variables (road and electricity) with inclusion of SMEs to the mining value chain. On the other hand, the R-squared show 51.4% which means that geographical location account for 51.4% of the variance in inclusion of SMEs in the mining chains.

Table 8 shows the ANOVA test in which overall, the geographical location (road infrastructure & electricity) are predictors of SME inclusion in the mining global value chain. The test show a p-value of less than 0.001 indicating that geographical location affect SMEs to supply to the mines.

Table 9 shows the regression analyses show that road and electricity infrastructure barriers are both statistically significant predictor of SME inclusion in the mining value chain.

DISCUSSION

The state of roads and electricity

The descriptive statistics show that the state of the roads and the cost of electricity prevent SMEs to engage in the supply chains. The road infrastructure leading to the mine is poor and un-

serviced in most countries in developing economies. Studies of Goedhuys and Sleuwaegen (2010) as well as Porter et al. (2002) show that road infrastructure enhance “ease of access to physical resources, communication and transportation whose price does not discriminate against SMEs”. Unfortunately, infrastructure such as roads and electricity are undesirable and exist in poor condition or are very expensive for SMEs. Whereas infrastructure is a critical factor for economic development; its existence is expensive as it interacts with the economy through the production processes (Adenikinju, 2005). Although there is direct link between the availability and quality of infrastructure such as road, and electricity to economic development (Oseni and Pollitt 2013), the World Bank (2014) reports that the availability of quality infrastructure in most countries is undesirable and makes SME uncompetitive as they fail to cope up. The use of Public-Private Partnership approaches to mobilize

Table 7. Model summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.717 ^a	0.514	0.511	0.963

^aPredictors: (Constant), electricity, road.

Table 8. Analysis of variance (ANOVA).

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	340.879	2	170.440	183.685	0.000 ^b
	Residual	321.978	347	0.928	-	-
	Total	662.857	349	-	-	-

^aDependent variable: Inclusion of SMEs to supply. ^bPredictors: (Constant), electricity and road.

private sector financing and expertise in infrastructure is very important to improve the position of SMEs to compete favorably in the global value chain (World Bank, 2014). Government policy initiative may help support entrepreneurship development and reduction of uncertainty as well as transaction costs (Naude, 2013).

Age and gender and their inclusion in the mine

A cross-tab of gender and geographical barriers to SME inclusion in the mining global value chain shows that the male genders have found more presence in the mining value chain. Business entrepreneurship plays a major role in job creation, innovation and growth. Whereas women entrepreneurship was driven by the theory of equity, social inclusion and equality; its development makes economic sense. Although the male gender is leading in becoming entrepreneurs, women get the chance through development programs aimed at enhancing education and awareness about their rights, vocational training, a basic education, psychological support and most importantly, tools that will enable their development and reintegration within the community. Further, a cross-tabulation between age and SME inclusion in the mining global value chain shows that the youthful SMEs are the majority to participate in the supply of good and services in the mines. The mining task or mining related task has proven a hard job for the too young or too old. Therefore, the youths in the age group above 20 years of age seem to be more concentrated in the mining activities

The impact of road and electricity infrastructure of SME inclusion

A multiple regression showed that the model used in the study showed a Multiple R of 71.7%. This means that there is a 71.7% correlation between the independent variables (road and electricity) with inclusion of SMEs to the mining value chain. The R-squared shows 51.4%

which means that geographical location accounts for 51.4% of the variance in inclusion of SMEs in the mining chains. The ANOVA test shows that overall; the geographical location (road infrastructure and electricity) is a predictor of SME inclusion in the mining global value chain. The test shows a p-value of less than 0.001 indicating that geographical location affects SMEs to supply to the mines. The regression coefficients also show that both road and electricity infrastructure sit statistically significant to SME inclusion in the mining value chain

CONCLUSION AND RECOMMENDATIONS

The study shows that there is a significant relationship between road and electricity infrastructure with SME inclusion with their p-values all less than 0.005. This means that these factors greatly affect inclusion of SMEs in the mining value chain. The study recommends that the government of the republic of Zambia empower the SMEs with good road net system and cheap electricity. This may be done by continuous repairs and maintenance of road infrastructure and provision of transport facilities such as rail. Further the government may subsidize electricity tariffs for SMEs in the mining area.

LIMITATION OF THE STUDY

In spite of the excellent methodological approach in this study, there were some obvious inherent limitations. The use of structured questionnaires provides a generalized insight with the possibility of disregarding some pertinent context-specific insights. The researcher tried to address some imitations by recommending a robust data set to capture a wider data set which is representative and relevant. There is a further need for refining the the geographical barriers through an internal review supported by further collection of feedback from more

Table 9. Regression coefficients.

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.	95.0% Confidence Interval for B		
	B	Std. Error	Beta			Lower bound	Upper bound	
1	Constant	0.900	0.139	-	6.494	0.000	0.628	1.173
	Road infrastructure	0.574	0.044	0.594	12.997	0.000	0.487	0.661
	Electricity infrastructure	0.202	0.049	0.186	4.078	0.000	0.104	0.299

^aDependent variable: Geographical barriers have greatly affected my inclusion to supply to the mines.

more stakeholders from within the global mining value chain.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

The overlooked role of market knowledge in the market integration of Ethiopian pastoralists

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In response to rapid globalization, African countries have dedicated considerable efforts to transform rural producers into businesses and integrate them with global markets. Pastoralists are mostly isolated from the other livestock value chain members. This makes it difficult for them to acquire knowledge regarding how the market functions and what the value chain members' want. This study explores how much pastoralists know and what knowledge they need to seize market opportunities. Using qualitative evidence from Ethiopian pastoralists, this study finds that pastoralists understand routine and physically existing facts such as selling livestock in a fixed market place during regular market days. However, the pastoralists lack the higher order knowledge that includes a broader understanding of the market phenomena and the abilities to scrutinize and interpolate those phenomena into their livestock raising experiential realm to make informed production decisions. This will hinder their functioning as "businesses" in modern value chains. This study therefore suggests for the development of market knowledge among pastoralists. Policy makers and development workers can consider marketing training to build the market knowledge of pastoralists. Further research could study how to effectively train the pastoralists to acquaint them with market knowledge to focus on market-based livestock production.

Key words: Market integration, market knowledge, remoteness, pastoral, Ethiopia.

INTRODUCTION

In recent decades, the world has witnessed rapid globalization with the increasing integration of production chains, international trade, investment and capital flows (Neethi, 2012; Nisanke and Thorbecke, 2007). In response to this globalization trend, African countries continue to liberalize their economies to integrate their locally and nationally organized markets with global markets (Borras, 2010; Carletto et al., 2010). This has facilitated the transition of agricultural producers such as

farmers, fishers and pastoralists to participate in global markets (Carletto et al., 2010; Dixon et al., 2004). The perceived benefit for these producers is gaining access to higher purchasing power and higher price paying markets, which contributes to a better livelihood (Minten et al., 2009). However, rural producers may not benefit from their integration into global markets on par with or as fairly as producers that are closer to towns and cities with better infrastructure and education. While it is difficult for

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all rural producers to seize market opportunities due to the deprivation of productive resources, such as knowledge, education and infrastructure (Barrett, 2008; Dorward et al., 2005; Narayan et al., 2000), it is particularly difficult for those who live in remote areas such as pastoralists.

Pastoralists operate in extremely remote rural areas that have scarce required productive resources; this has contributed to their poverty (UNDP, 2013). To lift pastoralists out of poverty, the development literature has focused on creating an enabling institutional environment to connect them with global markets that have higher purchasing power compared to their serving local markets (Barrett, 2008; Swinnen and Maertens, 2007; Verbeke et al., 2009). This literature has identified the absence of or poor infrastructure and limited access to financial services as barriers that prevent pastoralists from connecting with markets and from taking advantage of market opportunities (Barrett, 2008; Davies, 2008; Watson and van Binsbergen, 2008). Consistent with recommendations from this literature, policy makers and development workers have dedicated considerable efforts to remove institutional barriers (FAO and IFAD, 2016; UNDP, 2008). Aid agencies, for example, invested in infrastructure to link East African pastoralists to export markets (Aklilu and Catley, 2009). Research has indicated, however, that such investments have had minimal impact on livestock sales and that market off-take rates from pastoralists in the region remain low (Aklilu and Catley, 2009; Little et al., 2014).

Following a business management approach, a growing body of literature has begun to focus on the behavioural features of the producers as determining factors to improve the producers' market access and market off-take rates of institutional arrangements (Ingenbleek et al., 2013; Jayne et al., 2010; Zulu et al., 2007). This literature highlights that the production, consumption and marketing behaviours of producers are centrally important for their market integration and to the improvement of their living standards (FAO, 2014a; Jayne et al., 2010). Underlying these behaviours is knowledge that creates a critical understanding of people's environments. This knowledge facilitates people's adaptation and enables them to transform resources into higher living standards and development (FAO and UNESCO, 2003; World Bank, 1999). In cognitive psychology, knowledge is regarded as a necessary precondition to guide and shape individuals' behaviour to make informed choices for a better future and to accomplish their tasks successfully (Frick et al., 2004; Wilcock et al., 2004). Frick et al. (2004) argue that it is important to ascertain how much people know and what type of knowledge is needed to promote their behaviour to achieve desired results. However, to the best of our knowledge, the literature still lacks an in-depth investigation of the knowledge that remote producers obtain from their day-to-day interactions in the

marketplace and the knowledge they need to acquire by other means. Such a grassroots level investigation is important because it will help to design focused interventions that respond directly to the knowledge need.

This paper studies the market knowledge of Ethiopian pastoralists. This study explores the knowledge the pastoralists have regarding the livestock market and the knowledge they lack, the latter of which disfavours them from seizing market opportunities by increasing livestock quality and market off-take rates. Ethiopia has the largest pastoralist population in East Africa (CSA, 2013), the region with the largest pastoralist population in the world (Homewood et al., 2012). The nearly 15 million Ethiopian pastoralists inhabit approximately 60% of the country's territory (World Bank, 2013) and contribute up to 35% to the country's agricultural gross domestic product (Davies and Hatfield, 2007). Ethiopian pastoralists therefore turn the remote, harsh drylands into economically viable production environments (Ingenbleek et al., 2013).

The main findings of the study include that Ethiopian pastoralists largely understand the livestock market as a fixed physical place with regular market days for sellers and buyers to meet and transact. These pastoralists rarely recognize markets as mechanisms with different actors and respective roles to facilitate transactions between trading partners. These pastoralists also rarely recognize the relevance of considering the needs and interests of buyers during livestock reproduction. Instead, the majority of the pastoralists attempt to sell animals that they produce primarily to satisfy their own needs and interests, which is building herd size to ensure sustainable milk production and gain higher social status. The pastoralist lack the higher order knowledge that includes a broader understanding of the market phenomena and the abilities to scrutinize and interpolate those phenomena into their livestock raising experiential realm to make informed production decisions.

Market integration of pastoralists

The market integration of pastoralists is posited to provide several benefits to global markets, national economies and to pastoralists themselves. First, integrating pastoralists more with markets can facilitate the supply of livestock and livestock products that helps the global market respond to the globally increasing demand for animal-protein (Davies and Hatfield, 2007; Delgado, 2003). Second, this integration enhances the foreign earnings of national economies from livestock exports thus contributing to the national economic development (Davies and Hatfield, 2007). Third, pastoralists can sell (destock) and buy (restock) livestock to respond to recurrent droughts and climate variability, which are increasingly threatening their livelihoods (Little et al., 2001, 2008; Vrieling et al., 2016). Fourth, the cash

obtained from selling livestock enables pastoralists to purchase food items, education for their children, medical services for their families and herds, and other consumer goods (e.g., mobile and radio) (Headey et al., 2014; Turner and Williams, 2002). Despite these perceived benefits, studies are reporting that the remote and traditional pastoralists are not taking full advantage of the market opportunities that have been created (Little et al., 2014; Rugadya et al., 2005; Verbeke et al., 2009). In Ethiopia, for example, existing export abattoirs are reported to operate at less than half of their installed capacity due to the supply shortage of export quality animals (Teklewold et al., 2009). Thus, the livestock potential from pastoralists is not exploited to reduce poverty and ensure food security (Verbeke et al., 2009).

The research that investigated the reasons that impede pastoralists from taking advantage of market opportunities predominantly focuses on post-production factors (Little et al., 2014), including the absence of roads, marketplaces, holding grounds, quarantine standards, and the information communication tools that facilitate sales (Barrett, 2008; Teklewold et al., 2009) and the frequent animal rejection at marketplaces for low quality (McPeak and Little, 2006; Rugadya et al., 2005). The barrier for pastoralists to successfully integrate with markets can be explained by their remoteness, which hampers their learning and their use of knowledge about the market environment and the value chain members. This barrier renders it more difficult for pastoralists to respond to the demand for the consistent and timely supply of quality livestock to the export market. Because their remoteness deprives the pastoralists from acquiring up-to-date knowledge from the external environment, they may have no option but to build on and consistently exploit the experience and knowledge they have learned from their community within their neighbourhood.

At a more fundamental level, the literature on social cognition indicates that social influences, such as community and family orientation and education, build and modify the cognitive abilities or the knowledge of individuals through modelling, instruction and social persuasion (Bandura, 1989; Heckman, 2006). In contexts where productive resources that facilitate the flow of and exposure to knowledge and information are limited, communities orient their children to capitalize on local knowledge, passing knowledge from one generation to another, which leads to specialization in a specific economic activity (Narayan et al., 2000). Communities in productive resource scarce environments teach their children to develop knowledge that enables them to survive in that environment (Narayan et al., 2000). Consistent with this, a research conducted among Turkana pastoralists in Northern Kenya also reported that pastoral families teach their children (sons) to have large herd sizes to accumulate wealth, secure food and marry more wives to have more children (McCabe, 2004). Other studies also report similar findings that pastoralists learn

(from their ancestors) to increase their herd size (livestock asset building, which is fully based on a production orientation) as a sign of social status and as insurance against drought, animal disease and raiding (Bellemare and Barrett, 2006; Hesse and MacGregor, 2006; Johannesen and Skonhoft, 2011). In this respect, community and family orientation (that is, the social influences) shapes the behaviour of remote pastoralists to remain specialized in an economic activity that the pastoral community has carried out for generations. Pastoralists thus may exploit the knowledge that is developed from what is known in their community to support their behaviour of building herd size; because they have minimal opportunity to develop market knowledge through exploring external sources to obtain a better understanding about market phenomena.

Knowledge shapes the perceptions, goals (aspirations) and expectations of people, with the aspirations and expectations shaping and directing behaviour (Bandura, 1989; Narayan et al., 2000; Wilcock et al., 2004). People empowered with knowledge of what to do ("know-what"), why doing the task is appropriate ("know-why") and how the task should be done ("know-how") in their domain accomplish tasks for a productive life (Hiebert, 1986; Narayan et al., 2009). The business literature also states that businesses that possess strategic and higher-order knowledge use their knowledge to scrutinize the market environment and interpret market information to develop and market products that meet the expectation of customers (Kim and Atuahene-Gima, 2010; Marinova, 2004). The same literature conceives market knowledge as a strategic resource to understand what customer's value and to create offerings that meet the expectation of customers (Glazer, 1991; Slater et al., 2012).

Market knowledge: A strategic resource for sustainable market integration

Creating an enabling institutional environment by building roads, marketplaces, and information communication facilities has been identified as important to facilitate the market integration of pastoralists, thus this study takes a business perspective to understand the knowledge barriers that undermine the efforts of remote pastoralists to raise livestock according to market requirements. We bring market knowledge as a complementary approach that can also lead to an effective use of roads, marketplaces and information communication facilities. Market knowledge provides an understanding of the market phenomena, what the customer needs and what to do to respond to what the customer needs. From a business perspective, the customer is the judge who evaluates the products and makes decisions regarding whether to buy products that provide equal or higher benefits or to reject products that provide benefits below expectation (Woodruff, 1997). Because it is the logic of

market exchange that buyers purchase products if they expect to derive benefits, it also holds true in the buying-selling relationship between the livestock buyers (customers) and the pastoralists. Livestock buyers, such as exporters, purchase animals from pastoralists if they find that the animals possess the attributes (breed, age, weight, and health) that importers seek and are willing to pay for.

The business literature asserts that, to develop the product that buyers are willing to repeatedly purchase and to sustain their linkage with the producers, producers need to have knowledge regarding what the customers desire to obtain from purchasing and using a product (Slater, 1997; Woodruff, 1997). Importantly, the producers that acquire and possess broader knowledge about the market phenomena such as how the market operates and the objectives of market exchanges, the market dynamics, such as changes in customer preferences and adjustments in export-import policies, and the actions of competitors, consistently adjust their products to customer preferences (Glazer, 1991; Kim and Atuahene-Gima, 2010). Market knowledge that refers to a systematically developed and stored understanding of the market phenomena therefore guides producers to make profitable production and marketing decisions (Glazer, 1991; Kim and Atuahene-Gima, 2010). In this respect, pastoralists that develop knowledge about how the livestock market operates and what livestock buyers want to obtain from purchasing livestock are likely to raise commercially viable livestock.

Market knowledge is based on the knowledge of concepts, facts and procedures (sequential production and marketing activities) referred to as the know-what, know-why and know-how (Bollinger and Smith, 2001; Grant, 1996). According to the knowledge-based view (Grant, 1996), *know-what* refers to the knowledge about concepts and facts such as what is the market, what determines the price of a product and what do customers want from the purchase of a product (Bollinger and Smith, 2001; Lundvall and Johnson, 1994). Businesses with knowledge of such underlying concepts and facts understand that a market consists of a heterogeneous interacting set of parties involved in the process of facilitating market exchange (Burnett, 2008; Kotler and Keller, 2012). Such broader understanding of the market enables pastoralists to utilize alternative mechanisms to trade their products and to influence the different parties such as individual brokers and traders and institutions that facilitate transactions (Kotler and Keller, 2012). The researchers also recognize that the product attributes the changes in demand for and the supply of similar products as well as the adjustments in government policies determines the price of a product, enabling them to make informed decisions to take advantages of favourable market conditions or to survive unfavourable ones.

Know-why refers to the knowledge about the logic of why things should be done, such as why businesses

should be customer-focused (Grant, 1996). *Know-why* is a higher-order knowledge that provides a fundamental understanding of the principle underlying the existence of businesses. Businesses exist to satisfy customers and thus to make a profit (Slater, 1997); this also holds for pastoralists as far as they participate in market exchanges. *Know-how* entails the knowledge of how things are actually done (e.g., how do customer-focused businesses create offerings that respond to changing customer preferences) (Clarke, 2001; Sinkula, 1994). Such knowledge of important sequential activities that customer-focused businesses undertake is relevant for pastoralists to realize which activities are first and which are next to consistently align products to customer needs (Flint, 2004; Webster, 2002). Customer-focused businesses first assess the market, select specific customers to serve and define what these customers value in specific product attributes (Flint, 2004; Lanning and Michaels, 2000). These businesses then procure inputs for production and develop the products according to the predefined attributes (Webster, 2002). Finally, the businesses communicate the product attributes and deliver the products to the pre-specified customers through an appropriate channel in a suitable time (Flint, 2004; Lanning and Michaels, 2000).

The capacity of pastoralists to integrate with and benefit from the livestock market can greatly depend on their knowledge and understanding of the market phenomena and the interpretation and translations of those phenomena to their livestock production and marketing business to consistently align their livestock to the preferences of livestock buyers. However, there is no evidence about what the pastoralists really know in this regard and what knowledge they need to focus on market-focused livestock production and marketing business. Therefore, a study was conducted that provides qualitative responses to the following research questions: (a) What do pastoralists understand about the market and how it functions? (b) Do pastoralists understand the logic why to know what the customer wants? (c) What do pastoralists know about how to respond to what the customer wants?

RESEARCH CASES AND METHODS

Research cases

To find answers to the research questions, we conducted a qualitative study in three pastoral regions in Ethiopia: Borana, Middle Awash (Afar), and Shinile (Somali) (Figure 1). In these regions, pastoralist supports 86 to 95% of the population's livelihood (CSA, 2007). The regions are prone to erratic rainfall and recurrent drought, which trigger feed and water shortages, as well as food and social insecurity. The regions differ in how remote they are from central markets, cities, trade routes and Ethiopia's export-import outlet/inlet, as well as in the existence/absence of large private and governmental investments with the high potential to influence the flow of knowledge and information. The regions are thus selected as comparative cases to understand and explain how



Figure 1. Regions included as cases in this study.

pastoralists in less remote (Middle Awash and Shinile) and pastoralists in more remote (Borana) areas differ in their market knowledge.

The Borana region is far from the central markets and has very few large-scale agricultural projects. Borana pastoralists pursue a less diversified livelihood, with pastoralism as the main source of livelihood. In this region, pasture (the main input for raising livestock) is more available compared to the two other regions. Borana pastoralists are known for having large herds of a cattle breed that is fertile and suitable for beef production (Haile et al., 2011; Zander and Mburu, 2013). This finding makes Borana an important source of supply for livestock traders, fattening operators, slaughterhouses and exporters who strive to respond to the growing demand for animal protein.

The Afar region is characterized by an arid and semi-arid climate with low and erratic rainfall, with a mean annual rainfall as that has decreased to 150 mm and a higher average temperature of as much as 48°C. The Middle Awash of Afar, the area selected as one case in this study, is close to the central markets and is crossed by a main road and a railway that connects Ethiopia with Djibouti, Ethiopia's export-import outlet/inlet. In this area, large scale state farms and the commercial irrigation of cotton plantations exist; these provide Afar pastoralists an opportunity to frequently interact with investors to obtain broader and up-to-date information regarding the market and employment opportunity. Middle Awash pastoralists also engage in income generation activities other than livestock selling. These pastoralists largely engage in charcoal production, which is supported by FARM-Africa (a non-governmental organization) to clear a thorny, shrub tree, named *Prosopis juliflora*. Locals call this tree the *devil tree*; it was introduced approximately three decades ago to afforest the arid lands of the region but resulted in negative impacts by invading and destroying the scarce vegetation available for pasture. Charcoal traders from large cities including Addis Ababa and Adama visit this area on nearly a daily basis to collect charcoal.

The Somali region, specifically the Shinile zone, is a low land, arid area with 95% of the population engaged in pastoralism (Save the Children, 2011). Shinile zone is close to Dire-Dawa, one of the big Ethiopian cities, Djibouti and Somaliland. Shinile pastoralists sell livestock in and purchase food items and consumer goods from Dire-Dawa and have close interaction with Djibouti (Devereux, 2006). This area is also a route for the oldest and most vibrant informal cross border livestock trading (via Djibouti and Somaliland) (FAO, 2014b). In addition to selling livestock and livestock products, Shinile pastoralists generate income from charcoal production by selling to consumers in Dire-Dawa and Djibouti (8 of 10 of our interviewees produce and sell charcoal).

The present study of the three regions provides us with insights to reflect on the current livestock production and the marketing practice of Ethiopian pastoralists. In addition, the less remote contexts of Middle Awash and Shinile situated near large cities and Ethiopia's export-import route and the more remote Borana with minimal interaction with the central market allow us to provide a comparative perspective on the know-what, know-why and know-how.

Research methods

Field data were collected through triangulated methods of personal observation, individual interviews and focus group discussions. Using triangulation to source data in multiple approaches maximizes validity in a qualitative study (Gliner, 1994; Yin, 2011). Gliner (1994) specifically explained that employing triangulated methods is an utmost priority in ensuring validity in qualitative studies. In qualitative data collection, triangulation entails the use of multiple data collection methods, which include interviews, focus group discussions, personal observations and documents, which, in complementarity, improve the rigor of the data source, the validity and the convergence of the evidence (Oliver-Hoyo and Allen, 2006;

Schwandt, 2001). In researching the knowledge, behaviour and opinions of individuals, it provides a considerable confidence to report the findings if one (the researcher) personally saw the practice of the subjects of the research (direct observation), if someone who is part of the community expressed his feelings and opinions to the researcher (key-informant interview), and obtained the opinions and feelings of a group who share common values and similar views (Yin, 2011). This qualitative study explores the market knowledge that pastoralists have and what knowledge they need to seize market opportunities. The use of triangulated methods of personal observation, individual interviews and focus group discussions to collect data from the pastoralists (as individuals and in group) is thus particularly important for the methods to complement one another and ensure the validity of the evidence. The validity of this study's evidence is more enhanced by collecting data from different sources (experts, pastoralists, fattening operators, traders, brokers and exporters) and pastoral settings and compared the findings to arrive at valid justification about the Ethiopian pastoral context; sourcing data from different actors and comparing findings of different settings also help to ensure validity (Yin, 2011).

To first understand the current livestock production and the marketing practices of pastoralists, we personally observed the grazing areas and the market places to witness the herd size, the composition and feeding, trekking animals to marketplaces; we also observed to whom pastoralists communicate within the marketplaces and how they deal with brokers and traders. We also interviewed pastoralists on how they decide and select animals to sell. Experts (#10) who have rich experience in the livestock sector were also approached to reflect on the livestock production and the marketing practices of pastoralists; they also reflected on the Ethiopian livestock value chain.

Data on the know-what, know-why and know-how of the pastoralists were collected through in-depth interviews and focus group discussions based on a structured case study protocol (Yin, 2003). With regard to know-what, pastoralists were requested to explain what the livestock market means to them, who operates within the livestock market and in what role, and what are the quality attributes that different livestock buyers (exporters, fattening operators or slaughterhouses) seek. Know-what also includes the pastoralists' knowledge on what determines the prices of animals. The know-what questions assessed the pastoralists' abstract and factual understanding of the livestock market, the forces that cause livestock prices to change (market dynamics) and the specific attributes of target buyers of livestock.

Questions pertaining to know-why investigated the understanding of pastoralists of the underlying reason regarding why considering the livestock attribute preferences of buyers during the livestock reproduction process is important. Know-why questions also assessed the pastoralists' knowledge regarding why knowing how other livestock suppliers respond to the demands from livestock buyers is important to their livestock production and selling decisions. The questions on know-how focused on how market-oriented livestock producers scrutinize the livestock market phenomena, select specific livestock buyers they can profitably serve, and produce and market animals that specific buyers are willing to buy and pay for. Interviews on the know-what, know-why and know-how were conducted with 25 Borana, 15 Middle Awash and 10 Shinile pastoralists; 50 pastoralists in total. Key informants selection was based on the principle of representativeness (who have the necessary knowledge and experience to our research case) and saturation in which an additional interview no longer provides new information (Eisenhardt and Graebner, 2007; Mason, 2010). Interviews with pastoralists were largely conducted around settlements and grazing areas; a few were conducted around marketplaces. Marketplace interviews were conducted early, before peak market hours, or at the end of the market day to avoid infringing on the pastoralists' core business. In addition to the

interviews, we conducted three focus group discussions (one in each region) that consisted of an average of six to eight participants in each group. Each group discussion took, on average, one to one and half hours (Morgan, 1996). All interviews and discussions with pastoralists were conducted with the support of development agents (DAs) and employees of a local organization to easily bypass traditional hierarchies (from clan leaders to ordinary pastoralists), easily bridge communications and to minimize the stranger effect. The interviews and discussions on know-what, know-why and know-how were focused on obtaining responses to the research questions.

Finally, interviews were conducted with other actors from the Ethiopian livestock value chain including livestock brokers and traders (#10), fattening operators (#3), and meat and live animal exporters (#5) to obtain their opinions and reflections on the livestock quality and supply from pastoralists and the challenges these actors encounter to obtain the quality and quantity of livestock they want. Each interview lasted approximately 45 minutes to one hour. All interviews and group discussions were recorded and transcribed nearly exactly to capture the true feelings, the knowledge and the challenges of the pastoralists. We utilized a content analysis approach by identifying the quotes from individual informants that contain key words that pertain to the know-what, know-why or know-how (Table 1 for illustrative quotes). The quotes were then coded as know-what, know-why or know-how. Subsequently, we combined all quotes based on their respective codes for each region and summarized these into specific findings of the three types of knowledge. Finally, we compared the findings between the less remote areas of Middle Awash and Shinile regions on one hand and the remote Borana region on the other hand (Table 2).

RESULTS AND DISCUSSION

Figure 2 presents the current traditional livestock value chain that flows from pastoralists as primary producers to the export markets in Ethiopia and then to international markets. The value chain incorporates several members, including brokers traders, hotels, fattening operators, and slaughterhouses, as well as meat and live animal exporters, at different stages of market exchanges. Knowing what roles these members play in the market, the interdependence among chain members, what the subsequent chain members require from the preceding member(s), and why and how to respond to their requirements are useful to produce and supply what customers value. Producing and supplying products according to the requirements of the chain members strengthens and sustains relationships with the chain members, and thus enables them to satisfy the needs of end-consumers through collaborative and coordinated efforts (Kothandaraman and Wilson, 2001; Porter, 1985).

Current livestock production and marketing practices of Ethiopian pastoralists

The current livestock production and marketing practices reveal that the majority of Ethiopian pastoralists primarily raise livestock (cattle, goats, sheep and camels) to increase herd size as a reflection of social status and for nonmarket values (wealth in physical stock). The

Table 1. Illustrative quotes from pastoralists, traders, fattening operators, and experts.

Know-what	<p>'I always trek and sell my animals in Dubuluq. It is about 5 hours trekking from here (the village the pastoralist lives in)' (A Borana pastoralist).</p> <p>'I have contact with traders from Djibouti and Somaliland. I usually ask them when they will come to Dire-Dawa and Babile and what type of animals they will buy' (A Shinile pastoralist).</p> <p>'What pastoralists usually know is selling their animals when they need cash. Most pastoralists wait for the regular market days to sell their animals' (A fattening operator).</p> <p>'Pastoralists understand very obvious facts like the fixed marketplace as means of exchange. In the past when drought hits the pastoralists, the government offices have been sometimes arranging direct contact between traders and pastoralists, and they force the pastoralists to sell animals to the traders to avoid losses. It was a forceful quota system, and this can tell you that pastoralists don't consider it as a trading mechanism. In response to your question on which pastoralists are more knowledgeable about the market, I would definitely say Shinile (Somali) and then Middle Awash, but they don't have enough resources to attract the market' (An expert from SOS Sahel).</p> <p>'I have been researching the situation of pastoralists for several years now. If you approach Borana pastoralists and ask them about rich people in their clan, they can explain to you the name of every rich pastoralist's number of animals, the number of lactating cows he has, and even their colours. But they don't know the value of his animals in terms of the market. Regarding awareness, Somali (Shinile) pastoralists are more aware about the market, but Borana pastoralists have a huge market potential' (An expert from Pastoralist Forum Ethiopia).</p>
Know-why	<p>'Why do you ask me to think about people living in cities (customers)? I am a pastoralist raising livestock. Of course, I sell animals, and I get money. We don't ask buyers for money for free' (A Borana pastoralist).</p> <p>'I have been frequently facing rejections of my animals in the marketplace. I don't know why traders reject my animals. You have to ask the traders why they reject our animals' (A Borana pastoralist).</p> <p>'Why should I know how others produce and supply livestock? I don't compete with anyone' (A pastoralist from Middle Awash).</p> <p>'Our customers, especially exporters, demand the supply of livestock with specific attributes (weight, height, age and sometimes colour). Pastoralists usually don't know why they should care about the history (age) of their animals and at what age to sell their animals. I travel a lot to visit several marketplaces to obtain the required quality and quantity of livestock' (A trader).</p> <p>'Pastoralists continue to practice the traditional way of herding livestock they inherited from their ancestors. They focus on building herd size. To purposely focus on the market is not yet in their mindset' (An expert from Mercy corps).</p>
Know-how	<p>'I choose an animal depending on the cash I need. I only sell an ox if I need more cash to buy heifers for reproduction, cereals and cloths. I sell goat if I need to buy small things like kerosene, and pens and pencils for my children' (A Borana pastoralist).</p> <p>'I don't think pastoralists know the detail market-oriented activities to reproduce livestock for market. Pastoralists focus on production activities for themselves, not for the market' (An expert in SOS Sahel).</p> <p>'Pastoralists are very traditional and largely focus on increasing herd size. I don't believe they know what activities to undertake to produce commercially viable livestock' (An expert from FAO).</p>

livestock raising and managing practices of pastoralists is primarily destined to fulfil their needs, for example, milk production for household consumption. Pastoralists focus more on female animals because milk production is their major source of food. One can easily observe in the places where their livestock are corralled that many pastoral households have high percentage of female animals in their herd composition (for some pastoralists, as much as 80 to 85%). Pastoralists restrict grazing areas to feed lactating cows while the remainder move over long distances to search for pasture and water to ensure sustainable milk production and herd reproduction. A Borana pastoralist noted 'I have a few cows settled

here to produce milk for the family. The other herds are far from here; it can even take me two days to find them'. Herd mobility is increasing periodically due to erratic rainfall and recurrent drought that force rangelands to deteriorate, which, in turn, leads to the reduction of milk production (Feed the Future, 2015).

The evidence from our interviews with pastoralists and experts shows that declining milk production forces pastoralists to use the livestock markets more to sell livestock to obtain cash to purchase food items.

Most pastoralists decide the type of animals (goat/sheep, cattle or camel) they should sell largely based on the amount of cash they need to cover their

Table 2. Summary of findings by region.

Variable	Borana	Shinile/Middle Awash
Know-what	They usually devote much of their time to reproducing livestock in the remote grazing field. They recognize the routine of selling livestock in the fixed marketplaces or selling to rural traders on the way to the marketplaces.	Because of their interaction with nearby cities, charcoal traders and buyers from Djibouti and Somaliland, they have a relatively broader understanding of the livestock market compared to Borana pastoralists. Shinile pastoralists are better in recognizing alternative means through which they can gather market information and trade animals.
Know-why	They understand minimal regarding why they should consider the interest of buyers during livestock production. Knowing how other livestock suppliers assess and respond to livestock buyers is not a concern for Borana pastoralists.	They relatively recognize why they should be concerned about the preferences of buyers, but they do not understand why they should focus on the actions of other livestock suppliers. They do not understand the essence of competition.
Know-how	For most Borana pastoralists, knowledge is more on asking for price, choosing the animal that can be sold at or equivalent to the estimated amount of the household expenditure and meeting the broker to negotiate on their behalf.	These pastoralists, especially in Shinile, recognize more market-oriented activities including asking hotel owners about their interest, buying from markets, stall fattening cattle and then selling to the hotels.

their expenditures rather than on market conditions that cause the price of animals to increase or decrease. Because the majority of pastoralists sell animals to satisfy their cash needs, the frequency and number of livestock market off-take is low (this is very low during the wet seasons as milk production is sufficiently high to feed a household). The experts we interviewed explained that although traders are not interested in drought stricken, thin and undernourished animals, pastoralists often become desperate to destock more livestock during the dry season to avoid losses. The experts noted that low market off-take rates during the wet season and high death rates during heavy droughts continue to shrink the herd size of Ethiopia pastoralists.

Market knowledge among pastoralists: Know-what, know-why and know-how

From the insights on the current livestock production and marketing practices and the

findings from the know-what, know-why and know-how interviews with pastoralists, as discussed, the capacity of pastoralists to successfully and sustainably participate in the livestock market is beyond developing physical resources such as roads and marketplaces. Although roads and marketplaces are necessary, they are not sufficient for pastoralists whose mindset is oriented to reproduce livestock for nonmarket values, such as obtaining social status. The explanation of the findings on know-what, know-how and know-how discloses that the majority of the pastoralists, most importantly Borana pastoralists who have a high potential of marketable cattle breeds, lack the mindset that incorporates why they should be so concerned about the needs and interests of customers during livestock reproduction.

Know-what

In the context of pastoralists, a *livestock market* is any mechanism (e.g., a fixed physical place, a

direct personal contact, a negotiation with buyers or an arrangement through non-governmental organizations (NGOs), government offices, experts, families, friends or brokers) that allows livestock sellers and buyers to interact and effect exchanges. Thus, market exchanges can be effectuated through multiple interaction mechanisms that allow the pastoralists and livestock buyers to have unrestricted access to each other and that enable buyers to influence the livestock production in response to their current and future demands. For Borana, what most pastoralists know and consider when trading their livestock is the regular market days in fixed marketplaces. For most of the Borana respondents (88%), the term 'market' means a fixed physical place where many people gather to buy or sell goods. These pastoralists explained that they usually trek their animals over long distances to sell them in the nearest marketplaces. One Borana pastoralist, for example, defined a market as 'Dubuluq'(the name of a marketplace with Friday as a regular market day). The pastoralist further

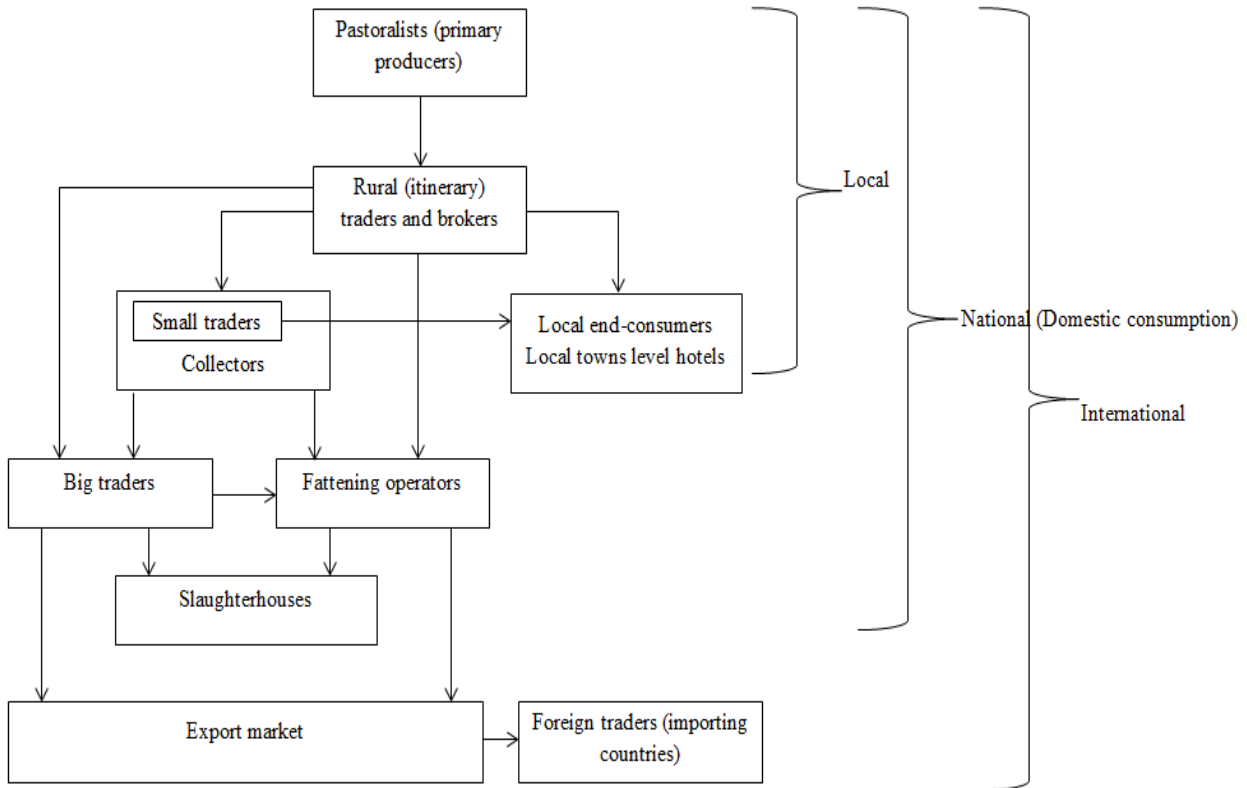


Figure 2. Ethiopian traditional livestock market chain.

explained, ‘I always sell my animals in Dubuluq. Other marketplaces are very far from our village.’ For Awash and Shinile, pastoralists have a relatively broader understanding of the livestock market. Importantly, Shinile pastoralists recognize a market as trading livestock in fixed marketplaces with cross-border traders and directly selling to hotel owners in Dire-Dawa and Djibouti. In this regard, one Shinile pastoralist noted, ‘I sell cattle in Babile (a nearby market place that is frequently visited by cross border traders via Somaliland and Djibouti) and have regular contact with and supply goats to Hotels in Dire-Dawa. I also know collectors who usually contact me one week in advance to prepare and supply sheep and goats to the rail route travelling from Dire-Dawa to Dewelle (Ethio-Djibouti border)’.

Livestock prices in Ethiopia change because of changes in the domestic demand for meat (usually due to consumers’ income changes, fasting, animal disease outbreaks, or government tax impositions), cross-border trade, supply (surplus or shortage) from producers, as well as consumer demands in importing countries and changes in the regulations of the importing countries. Borana pastoralists are more aware of the obvious facts such as the regularly occurring local Christian and Muslim fasting and holidays. Our respondents in Borana noted that they usually feel the price changes; however, they have minimal understanding of the factors that

cause the change. For Shinile, pastoralists are relatively more aware that, in addition to the regular fasting and holidays, demand from buyers from Dire-Dawa, Djibouti and Somaliland, and cross-border government control (tight or loose) cause the price of animals to change (increase or decrease). The evidence from our interviews with traders, fattening operators, exporters and experts shows that the different buyers in the Ethiopian livestock value chain have their own specific attributes for livestock they want to buy. Most pastoralists recognize that buyers are traders of a similar type. Most of the respondents in Borana responded to our question, ‘what different livestock buyers do you know?’ as, ‘I know the buyers are daldalaas (a Borana translation for traders)’. Pastoralists in Middle Awash and Shinile differentiate buyers as traders selling via or to Djibouti and Somaliland (export), retailers (hotels and slaughterhouses) and end-consumers buying goats and sheep.

Know-why

Exploring and acquiring knowledge from the market environment about the livestock value chain members is very difficult for the remote pastoralists who are isolated from accessing productive resources such as education, communication or minimal influence from the market.

Although understanding the logic of why pastoralists should consider the interest of livestock buyers during livestock production is difficult for all pastoralists, it is more difficult for the more remote Borana pastoralists. In contrast to Middle Awash and Shinile pastoralists who frequently meet with charcoal traders, central market traders and those trading to Djibouti and Somaliland, as well as to those who interact with large hotels in large cities such as Dire-Dawa, remote Borana pastoralists have minimal knowledge regarding why they should consider the needs and interests of buyers during livestock production. In response to the question 'Do you know why you should consider the interest of buyers when you raise your livestock?' one pastoralist in Shinile explained, 'Hotels in Dire-Dawa reject my goats if I do not supply the goats with the required weight and height'. Conversely, a pastoralist from Borana replied, 'We are pastoralists raising livestock for ourselves. Daldalaas give us money by taking our livestock in return.' For the remote pastoralists who usually spend much of their time reproducing livestock in the grazing fields, the livestock are important to the satisfaction of their own interests (that is, milk production and social status); they do not consider buyers' interest that could have guided their livestock production while raising the livestock.

With regard to whether knowing how other livestock suppliers respond to the preferences of livestock buyers, the pastoralists do not recognize it as competition from existing and potential livestock suppliers and as substitutes that livestock buyers may consider. Pastoralists know that there are others who supply livestock to the market, but they do not consider them as their competitors. The majority of the Borana pastoralists (92%) and the Middle Awash and Shinile (80%) do not sense and recognize rivalry although it exists. The pastoralists' responses to our question 'Do you consider highland farmers as your competitors?' were 'No, they are not our competitors. They do their own job and we do ours. We have our own separate fates and chances; they cannot take the chance that is already meant for us'. Competition, in the context of pastoralists, completion regards learning how other livestock suppliers respond to market requirements and strive to use such understanding as the input to produce high quality livestock for the market. The fact that pastoralists do not understand competition, regardless of whether they are less or more remote, can be explained from the customary rules they have developed for generations to support each other and not to compete over the scarce natural resources needed to survive in the harsh environment.

Know-how

On the knowledge of important sequential activities to produce and market livestock that buyers are willing to buy and pay for, pastoralists are more familiar with the

production-oriented and selling activities ("make and sell") such as raising the animals and selling when cash is needed. The customer-oriented activities of assessing the livestock market, selecting specific buyers to serve, defining livestock attributes in specific terms and reproducing livestock to respond to the needs of the buyers ("sense and respond") are nearly unknown to the pastoralists. Pastoralists know that they can gather price information by visiting marketplaces, by asking brokers from their clan and by discussing this with clan members who have been to the marketplaces. Pastoralists gather price information not to strategically use the information to leverage by responding to price trends but for immediate consumption to obtain the cash they need to cover immediate expenditures.

Comparatively, Middle Awash and Shinile pastoralists are more aware of the sequentially important production and marketing activities needed to produce and market commercially viable livestock. For example, Shinile pastoralists list more activities they know such as visiting the marketplaces to know what type of animals have high demand, asking traders about the demand for cattle, sheep and goats in Djibouti, Somaliland and the Middle East, asking hotel owners about their interest, and buying fodder and animals for stall fattening and resale. In contrast, the listing so most Borana pastoralists focus on choosing animals that can be sold at or equivalent to the cash they need, trekking the animals to the marketplaces and contacting brokers to negotiate for favourable prices on their behalf.

Overall, despite the knowledge differences that arise from locational advantage (remoteness), pastoralists understand more obvious and physical facts about the livestock market. Pastoralists' knowledge entails what they have acquired through every day experiences and repeated actions, as well as what they have learned from their ancestors. A higher-order and more abstract understanding regarding the manner in which the livestock market functions and most importantly, why the livestock buyer (the customer) is the most important stakeholder to consider while reproducing the livestock is not captured in the pastoralists' livestock production mindset. Consequently, it is commonplace to hear pastoralists complaining about the livestock market on one hand, and traders, fattening operators and exporters complaining about the quantity and the quality of the livestock supply from pastoralists on the other hand.

Reflections from livestock value chain members

Pastoralists complain that they benefit less from their market participation. The pastoralists complain that they encounter frequent rejections of their animals in the marketplaces or dispose of their animals at lower prices. One pastoralist in Borana explained, 'After travelling long distances to the marketplaces, we want to sell our

animals and return back to our settlements on time. But buyers often offer lower prices for our animals that we hoped to sell at better prices. We have no option other than selling. We cannot trek them back over the long distance'. Another pastoralist in Middle Awash exclaimed, 'I have no answer why I sold my best ox at a price that cannot even buy enough food for my family for Sugum (an Afar translation of the short (rainy) season of March to April)'. Pastoralists barely recognize that what is the best ox for them may not necessarily be best for the buyers. For example, pastoralists can consider a fattened, castrated ox as good quality, but castrated and old animals are not needed by exporters that pay higher prices. The pastoralists usually put the blame on the brokers and traders and rarely assume that their production-oriented business model is the reason for the lower prices and the low-quality animal-motivated rejections.

Pastoralists' blame of brokers and traders holds true for post-production, specifically for the ability to bargain for prices. Well-informed brokers and traders occasionally use ruses, psychological games and communication signs that pastoralists barely understand to communicate pricing or to mislead pastoralists. We observed that pastoralists become victims of the communication artifices and psychological games. In Borana, for example, we observed a trader using three brokers offering different prices to a bull of a pastoralist. The first broker offered a higher price, and subsequent brokers undermined the quality of the animal and offered sequentially lower prices. Because the pastoralist did not understand the ruse, he rejected all subsequent prices and waited for other buyers to offer him a better price; however, no one offered him a price above that of the first broker. Late in the afternoon, only the broker who offered the lowest price appeared; he knew the pastoralist was desperate to sell his bull and return to his settlement before sunset. Experts substantiated our observation that such a ruse and other unethical business dealings that exploit pastoralists are very common. Although pastoralists believe that brokers cheat them, the pastoralists' lack of knowledge to envisage alternative selling means, to influence negotiations in the marketplace or to have greater certainty regarding future sales by bypassing brokers force them to utilize these familiar brokers. For example, we found binding sentences such as, 'I usually contact the brokers from my clan and whom I've known for many years. I don't contact other brokers even when I feel I didn't get the right price'.

Traders, fattening operators and exporters also express their dissatisfaction for the current production and marketing practices of pastoralists. Traders complain that their efforts to bridge the members of the livestock value chain are full of challenges due to the shortage of quality and quantity in the supply of livestock from the source. The complaint from traders can be summarized as, 'We serve the demands of livestock from different buyers with

different requirements. The supply from producers including pastoralists does not account for buyers' requirements and is not in volume. Pastoralists sell animals largely when they need cash. This makes our job challenging because we have to visit several local marketplaces to collect the volume and quality of livestock that our buyers want'. Fattening operators also state that the shortage of quality livestock supply, and other issues, provides an uncertain future for their business. Fattening operators usually buy young and skinny animals with high fattening (increase both in weight and height) potential to feed and fatten for resale for domestic and international consumption.

In the area, we visited and where many fattening operators are concentrated, fattening operators primarily focus on fattening cattle and goats. These fattening operators prefer a cattle breed named '*Boran*' (with Borana pastoralists as the main source of this breed) and similar breeds from other low land areas; this includes cattle from the Bale lowlands and goats from Afar and Somali. Boran cattle breed is ascertained as a fast growing and quality beef breed compared to other indigenous cattle breeds in Ethiopia (Haile et al., 2011). Borana pastoralists, however, largely reproduce this breed for milk production and high social value. Fattening operators complain that they are operating under capacity primarily because of the supply shortage of such livestock. A fattening operator in Modjo (a town approximately 70 km far from Addis Ababa and where many of the fattening operators are concentrated) noted, 'I have the capacity to fatten 1,000 to 1,500 bulls over a period of three months, but I only have 120 bulls in stock as we could not find the right quality and quantity livestock from the market'. Fattening operators explain the shortage of quality livestock as, 'We often face age, muscularity and genetic problems. Producers do not bring animals at their right age for fattening'.

Exporters also echoed their dissatisfaction with the current livestock production and marketing practices of pastoralists. The evidence from our interviews with exporters indicates that importing countries that usually purchase Ethiopian livestock prefer uncastrated, young (with an average age of 2.5 to 3 years), fattened, healthy and (most often hornless) male animals. However, obtaining livestock that exactly fulfil these attributes in large volumes at once is challenging. Pastoralists do not maintain history data on their animals, for example, age and heath data, as they do not purposely reproduce the livestock for market. An exporter in Adama (the terminal market) explained, 'My interaction with importers is increasingly becoming less frequent as importing countries are increasingly becoming strict in food quality and safety while there is no change in livestock quality in the source'. The consequence is that small quantity and low quality livestock supplier pastoralists sell their animals to small and rural traders at local markets at lower prices. The pastoralists subsequently lose profits

Table 3. Summarising the concluding remarks from literature and findings of this study.

Studies on market integration of pastoralists			Studies on market knowledge			This study	
Representative references	Focus	Concluding remark	Representative references	Focus	Concluding remark	Focus (market knowledge)	Major findings
Barrett (2008), McPeak and Little (2006), Rugadya et al. (2005), and Teklewold et al. (2009)	Institutional environment (roads, finance, marketplaces, information communication facilities) (The market integration literature overlooks the role of market knowledge of pastoralists to complement and which can also facilitate the utilization of the productive assets in the intuitional environment).	-Construction and expansion of roads, market places and market information facilities (communication technology). -Reducing transaction costs (opportunism and rent-seeking behavior of market channel members) to overcome supply-chain development problems.	Bollinger and Smith (2001), Glazer (1991), Grant (1996), Kim and Atuahene-Gima (2010)	Formally established businesses in advanced markets	Knowledge about how the market functions, what the customers in the market where the businesses operate and why customers become willing to repeatedly purchase and pay for enable the businesses to align their products to the customers' expectation and to supply products that they can sell ("sense and respond").	Know-what	Whereas a <i>livestock market</i> can be considered as any mechanism (e.g., a fixed physical place, a direct personal contact, a negotiation with buyers or an arrangement through non-governmental organizations (NGOs), government offices, experts, families, friends or brokers) that allows the pastoralists to trade their livestock, for the majority of pastoralists it is a fixed marketplaces regular where the pastoralists trade their livestock in regular market days.
						Know-why	Pastoralists who spend much of their time reproducing livestock in the grazing fields assume that they reproduce livestock essentially to satisfy their own interests (that is, milk production and social status), and rarely see their livestock reproduction business from the eyes of the buyers.
						Know-how	On the knowledge of important sequential activities to produce and market livestock, pastoralists are more familiar with the production-oriented and selling activities ("make and sell"). The customer-oriented activities of assessing the livestock market, selecting specific buyers to serve and reproducing livestock based on targeted needs ("sense and respond") are nearly unknown to the pastoralists.

with the knowledge that can help them to broaden their thinking horizon to understand the market can enable them to recognize the benefits of raising livestock purposely to satisfy the demands of the market and to earn profits.

To sum up the discussion of this study, we interface the concluding remarks from the literature on market integration of pastoralists, the concluding remarks of the business literature on market knowledge and the findings of this study (Table 3). The literatures on the market integration of the pastoralists largely exert efforts on creating an enabling institutional environment (developing roads, information communication facilities, marketplaces and access to finance). Despite such efforts remote and traditional pastoralists are

still not taking full advantage of created market opportunities. This study contends that creating an enabling institutional environment is necessary but not sufficient for the remote pastoralists to reproduce and supply livestock that meet customer requirements. The pastoralists lack the high-order knowledge of why to see their livestock reproduction and marketing from the eyes of the buyers in the market. The business literature ascertains that knowledge on why to focus on what the customer's value and become willing to purchase products is essential for producers to organize their production and marketing around creating value for the customer and take advantage of market opportunities. By developing such knowledge, the pastoralists can thus

comprehend how the market functions, make-informed choice and decision to organize their livestock reproduction to meet customer requirements and utilize the facilitating resources in the institutional environment to trade their livestock.

CONCLUSION, RECOMMENDATIONS AND IMPLICATIONS

This study sets out to find answers to research questions that include understanding pastoralists' knowledge of the livestock market, whether pastoralists comprehend the logic why to know what the customer wants and whether they know

how to respond to what the customer wants. Ethiopian pastoralists largely understand the livestock market as a fixed physical place with regular market days for sellers and buyers to meet and transact. These pastoralists rarely recognize markets as a mechanism with different actors and respective roles to facilitate transactions between trading partners. These pastoralists also rarely recognize the relevance of considering the needs and interests of buyers during livestock reproduction. Instead, the majority of the pastoralists attempt to sell animals that they produce primarily to satisfy their own needs and interests, which is building herd size to ensure sustainable milk production and gain higher social status. Pastoralists rarely know how to strategically scrutinize the livestock market phenomena with the intention to align livestock reproduction to respond to the changing preferences of livestock buyers. We thus contend that developing physical infrastructure is necessary but not sufficient for the successful and sustainable market integration of pastoralists. Beyond removing physical distance, pastoralists need knowledge that reorients their isolated mindset to incorporate an expanded perspective on how the market operates and the logic regarding why customers decide and are (un)willing to invest their money to purchase products. With such marketing-based livestock production mindsets, pastoralists can productively use the infrastructure to frequently sell animals that buyers are willing to purchase.

The comparative analyses reveal that less remote pastoralists have more opportunities to explore and acquire knowledge from the market environment, which enables them to recognize market opportunities and to align their livestock to what buyers are willing to spend their money on. Frequent interactions with buyers enable the less remote pastoralists to build experiences regarding the quality attributes of the animals that buyers seek. Conversely, remote pastoralists who spend much of their time in the remote grazing areas have minimal opportunities to learn from the external environment because of their limited interaction with market actors and institutions. Due to the limited flow of knowledge and the information from the market environment, remote pastoralists exploit the knowledge they have learned from their family and from the community orientation that supports livestock asset building. Pastoralists thus are rarely customer-centric or aware of customers during production.

The capacity of the pastoralists to expand their thinking horizons to envision beyond the status quo to incorporate a market-based mindset can be stimulated through empowering them with market knowledge. We therefore recommend that, in their policies and projects, policy makers and development workers consider building pastoralists' market knowledge. One option to facilitate market knowledge development among pastoralists is to create an opportunity for pastoralists to easily interact with and learn from subsequent members of the livestock

value chain. Thus far, the development literature has provided insights on developing infrastructure such as roads and information communication facilities to allow information to flow among market actors (Barrett, 2008; Verbeke et al., 2009). Constructing roads and information communication facilities can reduce the barriers that undermine the livestock value chain members', including pastoralists, efforts to frequently interact. Developing infrastructure, however, takes long periods and requires the allocation of capital budgets with long-term effects. Focusing on infrastructure to facilitate market knowledge development over shorter periods will slow the undertaking of other recurrent and important activities that compete for scarce resources in developing countries such as Ethiopia. Policy makers and development workers should therefore seek complementary approaches such as marketing training that they can offer within their recurrent budgets to help remote pastoralists develop market knowledge over a relatively shorter period.

Marketing training is a specific element of education that conveys new market knowledge or that modifies and/or expands the market knowledge and the learner attitudes of learners or helps to maintain level of competence to respond to new developments and changing circumstances, and it enhances productivity (Goldstein, 1993). Because education shapes the minds of people by teaching fundamental concepts to develop foundational knowledge that will help them to process information to make logical and strategic decisions for a better future (Bostrom and Sandberg, 2009; Heckman, 2006; UNESCO, 2006), marketing training can equip pastoralists with a fundamental knowledge of how the livestock market functions and the reasons to consider the preferences of livestock buyers. Teaching fundamental marketing concepts such as markets, exchanges, customers, market dynamics, competition and value creation can acquaint the pastoralists with this fundamental marketing knowledge (Kotler and Keller, 2012).

This qualitative study investigated the market knowledge gap among pastoralists. Further quantitative study could be necessary to provide complementary insights and also to share the experience of conducting quantitative study to explore the market knowledge of remote and traditional communities. Further research could also study how to effectively teach the low-literate pastoralists to acquaint them with market knowledge so that they can focus on market-based livestock production to earn profits and to lift themselves out of poverty. Because pastoralists have their own traditional means of transferring knowledge over generations, such as metaphors and storytelling, further research could identify teaching methods and investigate how the methods from educational literature can be integrated with the pastoralists' traditionally structured methods to convey new knowledge. Studying and documenting the

knowledge gap and the methods suitable to teach the low-literate, traditional pastoral community could serve as an input to designing training interventions that empowers pastoralists to adjust their livestock to reap sustainable market-based economic benefits.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Empirical analysis of foreign direct investment and economic growth in Pakistan using VECM model

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Theoretically Foreign Direct Investment (FDI) is considered as a growth accelerating component that has attained significant heed in the development of the country in the past decade. Pakistan has been selected due to its geostrategic location, which is a major attraction for developed economies to invest in for lucrative returns. This study objective is to trace the long as well short run analysis among FDI, Gross Domestic Product (GDP), Gross National Income (GNI) and Imports (IMP) of Pakistan from year 1987 to 2017 by using the ADF Unit Root Test, Johansen co-integration approach, VECM and Granger causality methods. The results reveal that the two-way causality between FDI and growth in Pakistan is not highly significant. Pakistan's economic growth indeed attracts FDI influx, which supports the market-size hypothesis; while the FDI influx stimulates the economic growth of Pakistan to some degree, the result is not significant. In light of the results achieved, this study suggests future recommendations to policy makers for an effective strategic plan to welcome foreign investments in Pakistan.

Key words: Foreign direct investment (FDI), economic growth, vector error correction model (VECM), unit root test, co-integration analysis.

INTRODUCTION

FDI is an investment made by a firm or individual in one country in to business interests located in another country. Generally, FDI takes place when an investor establishes foreign business operations or acquires foreign business assets, including establishing ownership

or controlling interests in a foreign company (Bagchi-Sen and Saletore, 2001). FDI constitutes a resource flow which is particularly useful for the economic development of developing countries, especially for their industrial development. It provides a unique combination of long-

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term finance, technology, training, know-how, managerial expertise and marketing experience (Nwaogu and Ryan, 2015; Pegkas, 2015; Bende-Nabende, 2018). FDI is considered as an economic growth accelerating component that has received a strong attention not only in developed countries but also in developing and less developed countries during the past decade (Ghazali, 2010; Agrawal, 2015; Iqbal et al., 2010). As, Pakistan lies in a region which has great political, economic and military importance (Sial, 2014; Ahmar, 2014), however still failed to attract the FDI inflow in the country since last two decades which has significant impact on trade, economic growth and national income of the country. Being in the same vicinity as two major powers, China and Russia, adds to its position. Pakistan's geostrategic location is a key to unlock central Asian states and can provide access between the Gulf States as well as African and European countries, so it is a major attraction for emerging economies to invest in for lucrative returns (Markey and West, 2016; Rahman and Shurong, 2017).

The GDP value of Pakistan represents 0.49% of the world economy (TE, 2018a; WBG, 2018). Figure 1 shows Pakistan's last ten years GDP in USD Billion. GDP in Pakistan averaged 71.19 USD Billion from 1960 until 2017, reaching an all-time high of 304.95 USD Billion in 2017 and a record low of 3.71 USD Billion in 1960.

In South Asia, FDI inflows increased by 6% to 54 billion USD (UNCTAD, 2018). As per yearly figures published by the United Nations Conference on Trade and Development (UNCTAD), shows that Pakistan has been receiving the second highest net FDI inflows in South Asia after India (Table 1). Pakistan has maintained its position as the second largest recipient of FDI in the region while India got the first position in the FDI inflow table followed by India Bangladesh, Sri Lanka, Maldives and Afghanistan.

Pakistan's FDI inflows increased by 56% due to significant investment in infrastructure from China in support of the One Belt One Road Initiative. Flows to India were stagnant at 44 billion USD. Cross-border mergers and acquisitions deals have become increasingly important for foreign multinational enterprises to enter the rapidly-growing Indian market. In 2016, there were a number of significant deals, including the 13 billion USD acquisition of Essar Oil by Rosneft (Russian Federation). According to annual State Bank of Pakistan Report (SBP, 2018; UNCD, 2018), FDI in Pakistan increased by 3434.90 Million USD in 2017. Foreign Direct Investment in Pakistan averaged 2807.85 Million USD from 2010 until 2017.

As Pakistan, is benefiting from a number of projects being implemented along the China-Pakistan Economic Corridor (CPEC). This has resulted US\$46 billion of projects contained in the CPEC, which offers Pakistan an exceptional opportunity of increased FDI and for tackling some of the main barriers hindering its economic development: energy shortage, poor connectivity and

limited attraction for foreign investors (Esteban, 2016). The completion of these projects will definitely have significant effect on trade and GNI of Pakistan.

Does FDI play evidential role in boosting economic growth of Pakistan? This is our major question in the current work. The correlation between FDI and GDP in host countries, together with location determinants of FDI, has been the subject of considerable research for decades. There have been a lot of empirical studies devoted to the impact of FDI on the host economies. However, findings from these studies have been inconclusive so far. Some researchers have observed a positive relationship between FDI and growth (Gupta, 1983; Bende-Nabende and Ford, 1998; Ghazali, 2010; Iqbal et al., 2010; Haider et al., 2017). Others have found negative FDI-growth links (Caves and Caves, 1996; Zhang, 2001; Falki, 2009). Studies on Pakistan to analyze the long and short run relationship among FDI, GDP, GNI and IMP are limited. This article attempts to close the gap in the literature by conducting some regressions with time-series data to investigate the causality relationship between FDI, GDP, IMP and GNI in Pakistan by using the ADF Unit Root Test, Johansen co-integration approach, VECM and Granger causality methods.

LITERATURE REVIEW

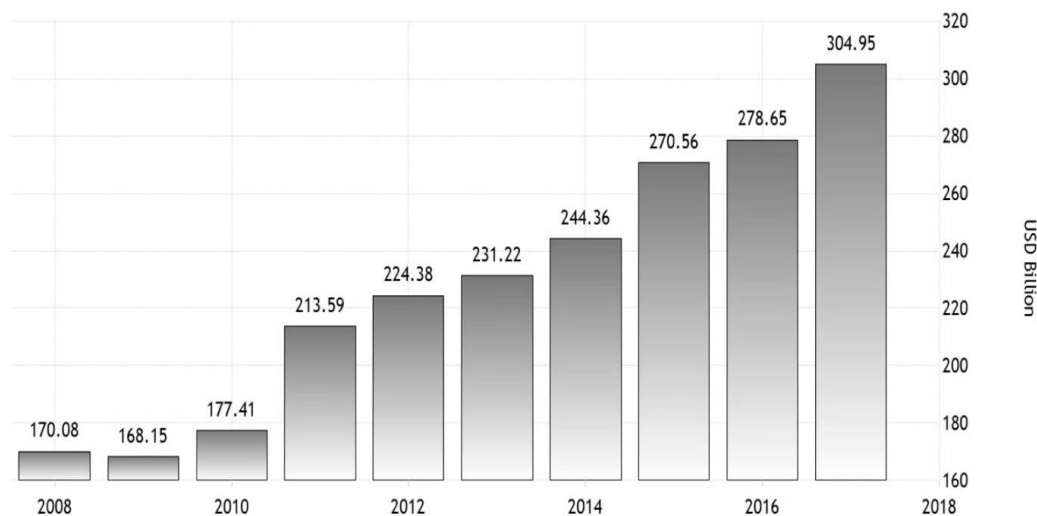
The relevance of FDI as a source of economic activity has increased rapidly over the last decade (Aqeel et al., 2004; Ahmad et al., 2012; Almfraji and Almsafir, 2014; Haider et al., 2017). Between 2000 and 2016, the share of FDI stock in global GDP increased from 22 to 35%. Following a decline during the Great Recession, mergers and acquisitions (M&As), the most dynamic component of FDI, have recovered, reaching a record value of \$1.2 trillion in the first quarter of 2018 (Federico and Elena, 2018). Based on CEIC 2018 Annual Report (Romer, 1986), Pakistan's FDI registered a growth equal to 0.99% of the country's GDP in June 2018, compared with a growth equal to 0.9% in the year 2017. The FDI reached an all-time high of 3.4% of GDP in June 2007 and a record low 0.0% in June 1977 (June 1977 - June 2018). According to State Bank of Pakistan report (SBP, 2018), the GDP in Pakistan was worth 304.95 billion US dollars in 2017. The GDP value of Pakistan represents 0.49% of the world economy. GDP in Pakistan averaged \$71.19 Billion from 1960 until 2017, reaching an all-time high of \$304.95 Billion in 2017 and a record low of \$3.71 Billion in 1960 (WBG, 2018).

Pakistan is an imports dependent country which enormously depends on foreign imports (Shahbaz and Rahman, 2012). Pakistan's imports are finishing goods while exports are initial goods, that are the reason of negative trade balance, as a result this trend affects the net behavior of FDI and GNI. Imports have significant

Table 1. FDI inflow in South Asia, USD Million.

Country	2011	2012	2013	2014	2015	2016
Afghanistan	83	94	69	54	58	-
Bangladesh	1136	1293	1599	1551	2235	2003
Bhutan	29	49	14	32	12	-
India	36190	24196	28199	34582	44208	46400
Maldives	424	228	361	333	324	-
Nepal	95	92	71	30	51	52
Pakistan	1162	859	1333	1865	865	2761
Sri Lanka	959	941	933	894	970	636

Source: UNCTAD (2018).

**Figure 1.** Pakistan Gross Domestic Product.
Source: TE (2018a).

negative impact on economic growth of a country (Atique et al., 2004). According to the United Nations COMTRADE database on international trade and Trading Economics historical database (TE, 2018b; UNCD, 2018), during year 2017, Pakistan bought \$57.4 Billion worth of imported products up by 31.2% since 2013 and up by 22.2% from 2016 to 2017. In year 2017, the top three Pakistani imports from all over the world include mineral fuels including oil (\$13.7 Billion which was 23.9% of total imports), machinery (6.9 billion USD that was 11.9% of imports) and electronic equipment (\$4.7 Billion with 8.3% of imports). If we talk about exports, Pakistan had shipped \$21.9 Billion worth of goods around the globe in year 2017, down by -12.9% since year 2013 but up by 6.5% from 2016 to 2017. The top three Pakistani exports include (i) worn and other clothes, (ii) cotton, and (iii) knit or crochet clothing with total worth of \$10 Billion which makes 45.6% of total exports (TE, 2018b; WRC, 2018).

On the other hand, Shahbaz and Rahman (2012) concluded in a study that imports play a crucial role between exports and economic growth, and ignoring imports from the analysis can yield misleading results (Mohey-ud-Din, 2007). A large share of imports of developing countries consists of capital and intermediate goods which enter into domestic production; so imports expand the country's production possibilities. This suggests that imports facilitate the export sector to use more advanced and sophisticated technologies which ultimately lead to higher export activities and growth. A decline in imports of factors of production causes a decline in output (Hentschel, 1992; Lee, 2010). So the relationship between economic growth and imports in case of Pakistan is inconclusive and need more empirical analysis.

FDI may be tricky for developing and developed countries in terms of adverse effect on competition, negative effect on balance of payments, inequality in

wages, jeopardizing national sovereignty as a result it will surely influence economic growth, trade activity and GNI of the country (Lipsey, 2001; Smarzynska, 2004; Johnson, 2006; Cuervo-Cazurra and Genc, 2008; Figini and Gorg, 2011; Saqib et al., 2013). Moreover, FDI can impose negative impact for the country if gains of FDI are captured by powerful elites and due to volatile nature of FDI flows and small spillover for local content suppliers. As it is expected that, economic activity will be enhanced in Pakistan in coming years due to China-Pakistan Economic Corridor (CPEC), which has great potential of increased FDI inflow. Pakistan has continued to attract Chinese investment related to the Belt and Road Initiative, with FDI inflows rising from \$2.5 Billion in 2016 to \$2.8 Billion in 2017 (UNCTAD, 2018). So, it is right time to evaluate the relationship between macroeconomic variables using appropriate statistical tools, in the present study, we have selected FDI, GDP, IMP and GNI to develop a better understanding and interpret the results in meaningful information.

THEORETICAL BACKGROUND

FDI theories were classified under macroeconomic and microeconomic perspectives (Denisia, 2010; Makoni, 2015). Macroeconomic FDI theories emphasize country-specific factors, and are more aligned to trade and international economics, whereas microeconomic FDI theories are firm-specific, relate to ownership and internalization benefits and lean towards an industrial economics, market imperfections bias. FDI theories are fairly complex to explain and apply. The relationship between FDI and economic growth has been extensively investigated by the researchers, practitioners as well as policy-makers. The opinions range from an unreserved optimistic view to a systematic pessimism (Caves, 1971). The neoclassical and endogenous growth models are considered as theoretical foundation for FDI led economic growth hypothesis of a country. The neoclassical growth theories suppose that FDI can channel the required funds to the productive sectors of a capital shortage economy which, as a result, favors increase the economic growth rate by increasing the marginal productivity of capital. The neoclassical economists view FDI as more reliable and less volatile sources of capital for the developing economies that can augment economic growth (Blomstrom et al., 1994; Balasubramanyam et al., 1996; Borensztein et al., 1998; Lipsey, 1999; Moosa and Cardak, 2006).

The causality between FDI and GDP growth could happen in either direction. FDI could promote GDP growth in the spirit of the Solow growth model (Chenery, 1967). It argues that through capital accumulation in the recipient economies, FDI may have growth effects on host economies because FDI is similar to domestic investment, and FDI is expected to generate non-convex

growth by encouraging the incorporation of new inputs and foreign technologies in the production function of the recipient economy. McKinnon (1964) states that in developing countries, lack of technology is the main obstacle to economic growth. The endogenous growth theories also reveal that the long-run growth of a country depends on the efficiency of utilizing investment and not only effected by the volume of physical investment. Hence, the endogenous growth model focuses on incorporating organizational, managerial, technical and human skills, innovation and technological progress, and accumulation of knowledge endogenously in the growth theories that are often brought by FDI (Romer, 1986; Lucas, 1988; Mankiw et al., 1992; Adhikary, 2011). Precisely, in the endogenous growth model, the long-run economic growth is viewed as a function of technological progress deriving from technology transfers and knowledge spillovers (Grossman and Helpman, 1991; Romer, 1994; Nair-Reichert and Weinhold, 2001).

The causal correlation between FDI and economic growth may possibly have a strong association either growth-driven FDI or FDI-led growth and it is quite likely that the two variables move together through feedback (Caves and Caves, 1996). Countries with rapid economic growth not only generate more demand for FDI, which is similar to domestic investment, but also provide better opportunities that lead to increased income for foreign investors and then attract a greater volume of FDI. On the other hand, FDI inflows may promote economic growth of the host country through positive direct effects and spillover effects. Both FDI and economic growth are positively interdependent and could lead to a two-way causality (Zhang, 2001; Zhao and Du, 2007).

Despite this positive link between FDI and economic growth, empirical evidence also reveals negative association between them. This view goes to the dependency theorists who argue that dependence on foreign investment tends to create a negative impact on economic growth and income distribution. The underlying assumption behind the dependency theory is that an economy controlled by foreigners does not develop organically rather grows in a disarticulated manner (Amin, 1974). The dependency theories also argue that foreign gigantic players may create negative effect on the growth and development of domestic firms' of a host country in the long-run as they have large volume of capital, superior technologies, higher market access, advanced marketing networks and better managerial and human relation skills (Markusen and Venables, 1999; Agosin and Mayer, 2005; Kumar and Pradhan, 2002). This situation could be even dismal for the limited capital young growing firms as they may be unable to compete with the Multinational Corporations (MNCs). In this tune, FDI tends to create a monopoly industrial structure which may lead to underutilization of productive forces (Bornschieer and Chase-Dunn, 1985). The dependency theories further argue that FDI can have an adverse impact on

employment, income distribution, national sovereignty and autonomy of a country (Musila and Sigué, 2006). FDI can also influence negatively the balance-of-payment position of a country if the inputs of production need to be imported (Musila and Sigué, 2006). Moreover, financial stability of a country may reduce by shrinking foreign exchange reserves when profits and capitals are repatriated. Thus, dependency theories argue that FDI is not an aid to the development rather it undermines the process of development (Razin et al., 1999).

In summary, this confounding theoretical and empirical evidence on FDI and economic growth relationship leads us to a discussion that FDI is country specific, and can be positive, negative or insignificant, depending on the economic, technological and institutional conditions of a host country as many authors document positive relationship between them while others do not trace it, or at best, report very weak relationship. These wide differences basically result from authors perspectives, sample selection, methodologies and analytical tools applied in their study (Chakrabarti, 2001; Adhikary, 2011). The present study thus extends Pakistan specific analysis to add knowledge in our empirical literature.

METHODOLOGY

Data description

Two types of research approaches widely used are quantitative and qualitative approaches. We have used quantitative research method to perform this research study for forecasting and predicting future behavior of FDI in case of Pakistan. Several research studies (de Mello, 1999; Ramirez, 2006; Qi, 2007; Har et al., 2008) practiced the time series method of forecasting. Time series data analysis tool measures historical data points to envisage future conditions and events. The goal of the time series method is to identify meaningful characteristics in the data that can be used in making statements about future outcomes. This is a useful tool to measure both financial and endogenous growth. The impact of policy variables can be evidenced through time series tests. The secondary time series data and valuable information for this study are gathered from following official departments of Pakistan and some international organizations, namely:

- (1) International Monetary Fund (IMF) Reports
- (2) The United Nations Conference on Trade and Development (UNCTAD)
- (3) World Investment Reports (WIR)
- (4) State Bank of Pakistan Annual Reports (SBP)
- (5) World Development Indicators (WDI)
- (6) International Financial Statistics (IFS)
- (7) Handbook of Statistics on Pakistan Economy

Ordinary least square (OLS) regressions and the empirical analysis are conducted by using annual data on FDI, GDP, GNI and IMP of Pakistan from year 1987 to 2017. In this study, we have to examine the relationship of macroeconomic variables by using different tests in software Eviews 9. Variables of interest are FDI, GDP, GNI and IMP.

$$fdi = \beta_0 + \beta_1 GDP + \beta_2 GNI + \beta_3 IMP + \varepsilon \quad (1)$$

The respective natural log transformation Equation 1 is:

$$\ln fdi = \beta_0 + \beta_1 \ln GDP + \beta_2 \ln GNI + \beta_3 \ln IMP + \varepsilon \quad (2)$$

where

$\ln fdi = \log$ of foreign direct investment (inflow)

$\ln GDP = \log$ of gross domestic product

$\ln GNI = \log$ of gross national income

$\ln IMP = \log$ of import (good & services)

Unit root test

In order to examine the long run relationship among variables, we have to test the stationary of the series, the article uses the Augmented Dickey Fuller (ADF) unit root testing procedure (Dickey and Fuller, 1979). We have tested stationary of all the variables in level 1 (0), if these variables are non-stationary at level to make them stationary, they are tested at order one I (1), and at order two I (2). Enders (1995) suggests that testing unit roots should be started from the most general model which includes trend and intercept. The model can be written as follows:

$$\Delta Y_t = a_0 + \gamma Y_{t-1} + a_2 t + \sum_{j=2}^{\rho} \beta_j \Delta Y_{t-j+1} + \varepsilon_t \quad (3)$$

where

$Y =$ dependent variable

$t =$ trend

$a =$ intercept

$\rho =$ lag level

Co-integration test

It was concluded that all variables are integrated of order one, I (1), so we proceed to Johansens cointegration test. We have chosen optimal lag length by SC criteria. We examine Johansen-Juselius cointegration test to examine the long run equilibrium exists or not.

Johansen proposes two different likelihood ratio tests of the significance of these canonical correlations and this can be shown via the trace and maximum Eigen value tests, which are given in Equations 4 and 5, respectively.

$$J_{trace} = \sum_{i=r+1}^n \ln(1 - \lambda_i) \quad (4)$$

$$J_{max} = -T \ln(1 - \lambda_{r+1}) \quad (5)$$

where T is the sample size and λ_i is the i th largest canonical correlation. The trace test exams the null hypothesis of r cointegrating vectors against the alternative hypothesis of n cointegrating vectors. The maximum eigenvalue test, on the other hand, tests the null hypothesis of r cointegrating vectors against the alternative hypothesis of r + 1 cointegrating vectors. We reject the null hypothesis if the value of Trace and Max-Eigen statistics > 5%

critical value.

Vector error correction model (VECM)

After estimating the co-integration test, we found that there is cointegration in our model. In order to explain the changes in FDI, both short and long term relationships are estimated using the *Vector Error Correction Model (VECM)*, which explains the changes in terms of changes in GDP as well as deviations from the long term relationship between FDI and GDP. The cointegration equation and long run model is written as:

$$ECT_{t-1} = Y_{t-1} - \eta_j X_{t-1} - \varepsilon_m R_{t-1} - r_c Z_{t-1} - \mu_t \quad (6)$$

where

$$Y_{t-1} = FDI$$

$$\eta_j = \text{coefficient of } gdp$$

$$\varepsilon_m = \text{coefficient of } gni$$

$$r_c = \text{coefficient of } imp$$

$$\mu_t = \text{error term}$$

Granger causality test

In order to check the cause effect of two variables that either Z_t granger Y_t ($Z_t \rightarrow Y_t$) or Y_t causes Z_t ($Y_t \rightarrow Z_t$) or there is bi-directional causality between Z_t and Y_t ($Z_t \rightleftharpoons Y_t$) or both variables are independent of each other ($Z_t \not\rightleftharpoons Y_t$). The direction of granger causality in this case can only be detected through the Error Correction Model derived from the long run equilibrium. Granger (1988) suggests the following causality model:

$$Z_t = \sum_{j=1}^m a_j Z_{t-j} + \sum_{j=1}^m b_j Y_{t-j} + \varepsilon_t \quad (7)$$

$$Y_t = \sum_{j=1}^m c_j Z_{t-j} + \sum_{j=1}^m d_j Y_{t-j} + \eta_t \quad (8)$$

where m is the maximum number of lagged observations included in the model (the model order), the matrix a_j contains the coefficients of the model. If the variance of ε_t (or η_t) is reduced by

$$ECT_{t-1} = 1.000lnfdi + 0.082lngdp + 1.624lngni - 5.267lnimp + 10.47 \quad (9)$$

Equation 9 shows us results of long run relationship among variables. The coefficient value of GDP tell us that 1% change in GDP increases FDI by 0.08%, 1% change in GNI increases FDI by 1.62% and 1% change in IMP decreases FDI by 5.26% in the long run. Hence, the result indicates that both GDP and GNI positively affect FDI and IMP negatively affects FDI in long run.

Table 4 reports the Granger causality test statistics of FDI. The results suggest that there is no causality between GDP and FDI as p-value is greater than 0.05

the inclusion of the Z_t (or Y_t) terms in the first (or second) equation, then it is said that Y_t (or Z_t) Granger-(G)-causes Z_t (or Y_t). After estimating VECM, we estimated some diagnostic test, that is, hetero-scedaticity and LM test to check the serial correlation.

Impulse-response function

In order to identify structural shocks and their dynamic effects, the innovation-accounting techniques have therefore been adopted, which consist of impulse response functions (IRF). The IRFs inspect the relative effects of each variable on other variables and display the response of each concerned variable in the linear system to a shock from system variables. So analysis of interactive impact among foreign direct investment, economic growth, gross national income and import is done.

RESULTS AND DISCUSSION

Unit root test

Table 2 shows that at first difference series reject the H_0 of unit root as ADF statistics exceed the critical value at 5%. Hence, the result of ADF test for FDI, GDP, GNI and IMP is not stationary I(0), 'at level' but the same becomes stationary at the position I(1), 'at first difference'.

Johansen co-integration test

The optimal lag length for the model is 2 selected by SC: Schwarz information criterion. In our case, the results of Johansen cointegration test reported that there exists long run equilibrium between the variables (*fdi, gdp, gni & imp*) as reported by some other authors who found same trend in their research work (Asghar et al., 2011; Nosheen, 2013; Amit et al., 2016; Khan et al., 2018). The trace statistics indicate that there is one cointegration equation at the 5% level (Table 3).

Vector error correction model

The cointegrating relationship is given by Equation.

and the null hypothesis cannot be rejected due to very low F-statistics and the corresponding higher p-value than that at 5% level of significance. The unidirectional causal relation, however, is documented from FDI to GNI in case of Pakistan, further, other pair wise null hypotheses cannot be rejected, suggesting there is no existence of causal effect from IMP to FDI and from FDI to IMP. More specifically, the null hypothesis of no Granger causality from IMP to FDI and FDI to IMP are not rejected with F-statistics of 0.29328 and 1.88870,

Table 2. Results of Unit Root Test.

Variable	ADF statistic at level		ADF statistic 1st difference	
	Critical value at 5%	T-statistic	Critical value at 5%	T-statistic
Ln(FDI)	2.963972	1.588704	2.986225	3.629634
Ln(GDP)	2.963972	0.212194	2.967767	5.069443
Ln(GNI)	2.963972	0.078205	2.967767	5.232166
Ln(IMP)	2.963972	0.288176	2.967767	5.058856

Source: Computed results based on secondary data for 30 observations from IMF and World Bank.

Table 3. Results of Johansen cointegration test.

Unrestricted	Cointegration	Rank	Test	(Trace)
Hypothesized No. of CE(s)	Eigen value	λ trace Statistics	Critical value 5%	Probability
None	0.585406	54.23926	47.85613	0.0112
Atmost 1	0.555373	29.58651	29.79707	0.0529
Unrestricted	Cointegration	Rank	Test	(Maximum Eigen value)
Hypothesized No. of CE(s)	Eigen value	λ trace Statistics	Critical value 5%	Probability
None	0.585406	24.65276	27.58434	0.1135
Atmost 1	0.555373	22.69455	21.13162	0.0299

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level. Max-eigenvalue test indicates no cointegration at the 0.05 level. *Denotes rejection of the hypothesis at the 0.05 level.

Table 4. Pair wise Granger causality test.

Null hypothesis	Obs	F-Statistic	Prob.
LNGDP does not Granger Cause LNFDI	30	1.13233	0.2967
LNFDI does not Granger Cause LNGDP		1.00068	0.3260
LNGNI does not Granger Cause LNFDI	30	0.09369	0.7619
LNFDI does not Granger Cause LNGNI		10.3275	0.0034
LNIMP does not Granger Cause LNFDI	30	0.29328	0.5926
LNFDI does not Granger Cause LNIMP		1.88870	0.1806

respectively. The unidirectional causality and spillovers of FDI may be attributed to the mobility of natural resources and skilled labor force along with availability of large market across the border in response to the policy innovations in Pakistan.

Impulse-response function

Under different degrees of economic time period there exist differences in the dynamic response path for both impulse and response of fictitious economy. So analysis of impact among FDI, GDP, GNI and IMP is done from the period of 1 to 8 years. As shown in the Figure 2, a one standard deviation shock of GDP increases from period 1 to period 2, and from period 2 to 3, there is not much changes in GDP, from 3 to period 6 it decreases

and later it become stable. The shock of FDI to GDP, GNI and IMP remain positive and FDI clearly benefits host economies. New technologies may arrive via international trade as well as by foreign investments. Such investments can enhance the growth process in the host economy and raise welfare in the home economy by providing an additional flow of income to an investment in knowledge. When the government requires the foreign firms to use inputs exclusively from the host country, FDI raises employment.

In Figure 3, a one standard deviation shock of FDI to GNI is below the zero line and it sharply declines from period 1 to period 3, and from period 4 to 8 it is increasing with the passage of time but remains in the negative zone, which means response of FDI to GNI is negative in current as well as future period. A one standard deviation shock of GDP to GNI is decreasing in

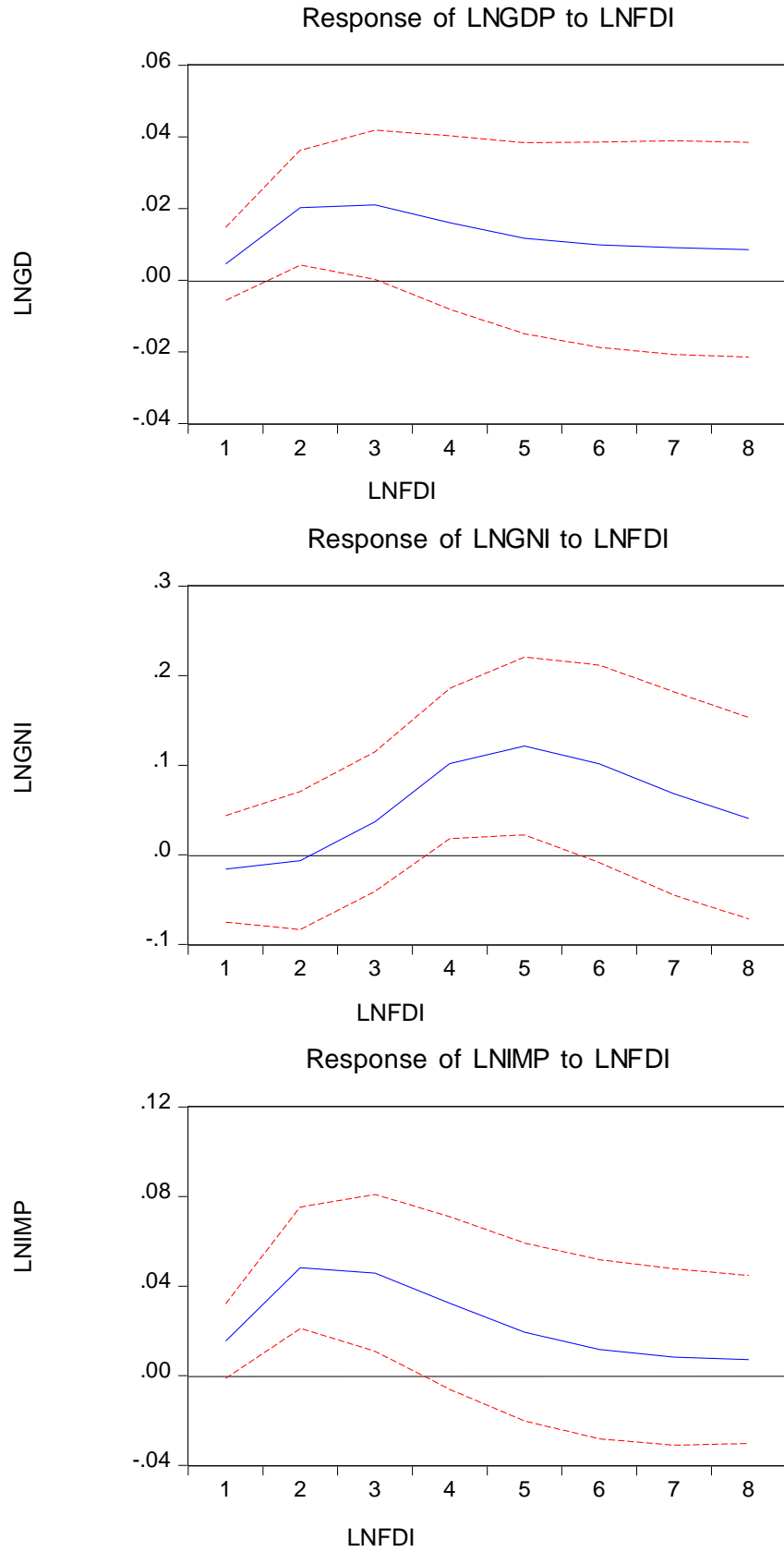


Figure 2. Response to Cholesky one SD innovations ± 2 S.E Response of LnGDP to LnFDI, Response of LnGNI to LnFDI, and Response of LnIMP to LnFDI.

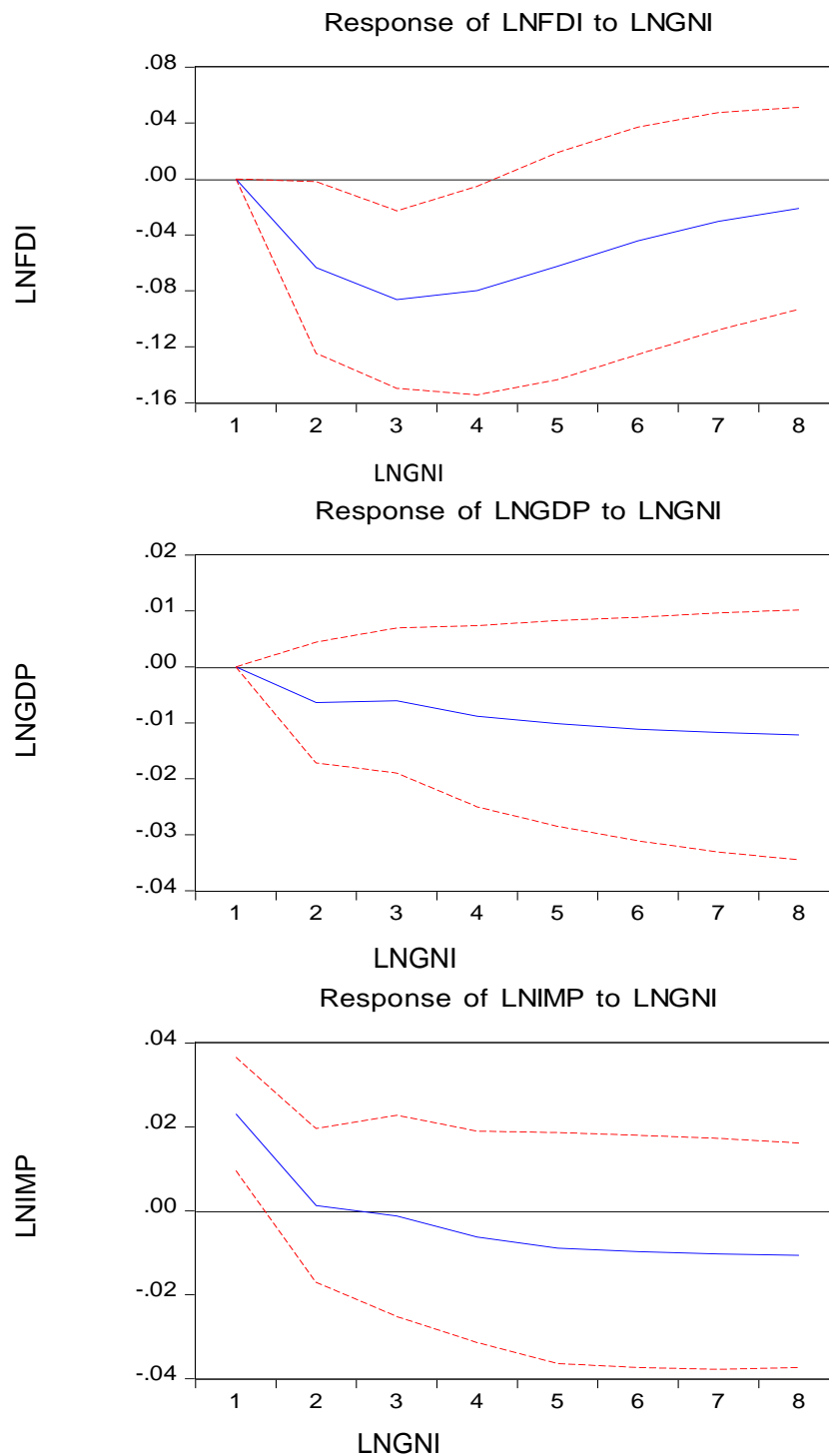


Figure 3. Response to Cholesky one SD innovations ± 2 S.E, Response of LnFDI to LnGNI, Response of LnGDP to LnGNI, and Response of LnIMP to LnGNI.

the early period become stable and later it declines and remains in negative region. Response of IMP is sharply decline from 1 to 2 years and hit the steady state value and it gradually decreases from period 3 to onward.

In Figure 4, a one standard deviation shock of FDI to IMP is slightly increasing in first period it become stable from 2 to 3 period, later it continuously declines and cross the steady state value, from 6 to 8 period it increases but

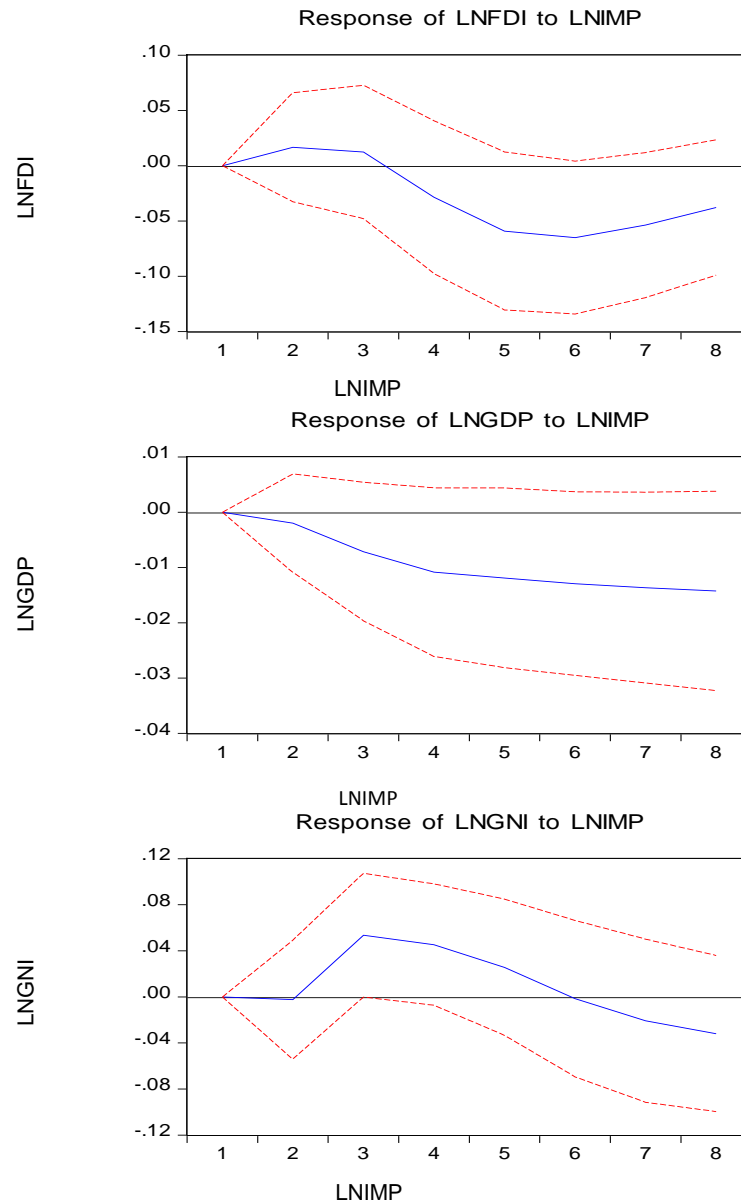


Figure 4. Response to Cholesky one SD innovations ± 2 S.E, Response of LnFDI to LnIMP, Response of LnGDP to LnIMP, and Response of LnGNI to LnIMP

remains in negative zone. In case of GDP, a one standard deviation shock of GDP remains at zero line and continuously decreasing from 2 to 8 period, which means response of GDP to IMP is negative. A one standard deviation shock of GNI to IMP initially remains at zero line, then sharply increases from 2 to 3 period, later it declines and goes to negative zone, it shows us asymmetric response of GNI to IMP.

FDI can encourage the adoption of new technology in the production process through capital spillovers. Second, FDI may stimulate knowledge transfers, both in terms of labor training and skill acquisition and by

introducing alternative management practices and better organizational arrangements. A survey by OECD (Hansen and Rand, 2006) underpins these observations and documents that 11 out of 14 studies have found FDI to contribute positively to income growth and factor productivity.

Stability check

To check the stability or robustness of the model, we had conducted "Residual tests" which comprises of LM test,

CUSUM test and Heteroskedasticity test. The LM test was carried out to analyze the serial correlation. Serial correlation is the relationship between a given variable and a lagged version of itself over various time intervals. Serial correlations are often found in repeating patterns, when the level of a variable affects its future level. The results obtained after conducting LM test were as P-value = 0.1412 and 0.0764 which were greater than 5% significant value, so we could not reject the Null Hypothesis of no serial correlation. Then, the second test was the CUSUM test which explains the stability of the model. The graphical trend fell between 5% significant boundary which confirmed that our model is stable. The last test was the Heteroskedasticity test which was conducted to see the Heteroskedasticity in our model. The P-value = 0.1996, obtained as result of this test which was greater than 5% significant value, so there is no Heteroskedasticity in our model.

Conclusion

This work aims to trace the long and short run analysis among FDI, GDP, GNI and IMP of Pakistan by using the ADF Unit Root Test, Johansen co-integration approach, VECM and Granger causality. All the four estimated variables are found to be stationary at the first difference level; the Johansen co-integration approach confirms that there exists one co-integrated equation in our model. The significant findings of long run relationship in our study includes 0.08% increase in FDI by 1% increase in GDP, 1.62% increase in FDI by 1% increase in GNI, while 5.26% decrease in FDI by 1% increase in IMP. Hence, the results indicate that, both GDP and GNI positively affect FDI but IMP has negative effect on FDI in long run. The results indicate that there is no significant Granger causality from FDI to economic growth, in case of Pakistan. The development of Pakistan's economy attracts FDI demonstrating the validity of "the market-size hypothesis" and indicating that output and its growth are determinants of FDI. That FDI does not have an obvious booster effect on the development of Pakistan's economy means that previous research has overestimated the positive effect of FDI on economic growth. However, government of Pakistan must cultivate an environment of economic liberalization and open market access to encourage multinational companies with high-technology capabilities and valuable intellectual property to come and invest in the country. The policy makers must overcome tariff and non-tariff barriers in the course of FDI which includes imposing price controls, demanding technological transfers, intellectual property expropriation, forced joint ventures and compulsory licensing. The policy makers should also pay attention to make strategies to reduce dependency on high interest foreign aids which has negative impact not only on the FDI and economic growth of the country but definitely on the

independence and stability of the country. An additional result of Pakistan's currently unpredictable political situation, which creates uncertainty for potential foreign investors as major long term investments are not made instantly, nor are they undertaken without careful economic analysis. This study suggests that the government of Pakistan must offer equitable market access without requiring technological transfers, provide authentic protection for intellectual property without the threat of compulsory licensing, and offer a transparent, predictable, long-term regulatory regime.

RECOMMENDATIONS

From a recommendation standpoint, this study submits that government of Pakistan should strive for liberalizing the regulatory framework surrounding FDI with the hope that this will consequently results in fast growth for the Pakistan's economy as a whole. The other important fact is the political instability which restricts foreign investors to invest in the country. The effect of uncertainty, particularly uncertainty of outcomes, is a well-studied area of economics and this analysis will certainly incorporate an estimate of the potential effect of unexpected regulatory or political outcomes for the firm. It is what enables firms to invest heavily to create knowledge capital without fear of expropriation. Capital firms are then used in order to build and sustain a competitive advantage in markets around the world. Without further improvement in Pakistan's regulatory and political environment, foreign investors will experience a reduced incentive to continue investing, and making, in Pakistan. It is strongly recommended to deeply investigate and seek solutions for the tariff and non-tariff barriers which restrict the foreign investors to invest in Pakistan. It is also recommended to analyze that how foreign investors can effectively access Pakistani markets, recover costs and make profits associated with innovation and maintenance of intellectual property.

ABBREVIATIONS

FDI, Foreign direct investment; **GDP**, gross domestic product; **GNI**, gross national product; **IMP**, imports; **ADF**, Augmented Dickey Fuller Test; **VECM**, vector error correction model; **SBP**, State Bank of Pakistan; **USD**, United States Dollar; **TE**, trading economics; **UNCD**, United Nations COMTRADE database; **WRC**, World's Richest Countries; **CPEC**, China-Pakistan Economic Corridor; **EU**, Europe; **TNC**, Transnational corporations; **OECD**, Organization for Economic Co-operation and Development; **MNE**, multinational enterprise; **UNIDO**, The United Nations Industrial Development Organization; **EME**, emerging market economies; **SAARC**, South Asian Association for Regional Cooperation; **FMOLS**, fully

modified ordinary least squares; **WBG**, The World Bank Group; **IMF**, International Monetary Fund; **UNCTAD**, The United Nations Conference on Trade and Development; **WIR**, world investment reports; **WDI**, world development indicators, **IFS**, International Financial Statistics; **SC**, Schwarz information criterion; **LM**, Lagrange Multiplier; **IRF**, impulse response functions; **WRC**, world's richest countries.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Internal control and quality service delivery in a public health sector: A case study of a Local Government in Uganda

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The main objective of this paper was to examine the effect of internal control on quality health service delivery in Greater Iganga Local Government. This study adopted a cross-sectional research design. A population of 205 health facilities were targeted. Stratified and simple research techniques were applied to obtain a sample size of 127 health facilities whose accounting managers, health managers and instructors, laboratory officers, personnel managers and drug stock administrators and supervisors formed the unit of inquiry on internal control while health service clients formed the unit of inquiry on the quality of health services offered. Data were collected by the use of questionnaires which were self-administered to 635 respondents. The responses were aggregated to the respective units of analysis (Health Centers). SPSS was employed to execute correlation and regression analysis. The finding revealed that internal control is positive and significantly linked to quality health service delivery ($r=0.715$; $p<0.001$). This implies that internal control considerably influences quality health service delivery in Greater Iganga Local Government. The study findings accrued from cross-sectional study design which is screwed with certain limitations. Future study should consider the same study through other study designs. Moreover, the study was done within the setting of Uganda local government, thus future study should consider testing this model in other local governments.

Key words: Internal control, quality health service delivery, local government.

INTRODUCTION

Attaining service gratification in the whole world demands that local governments improve on the quality of services they offer (Makanyeza et al., 2013; McNeil et al., 2009; Sudhakar and Selvam, 2008). Service quality particularly in the health sector is linked with improved human well-being and in return, enhances productivity of life (Kimenyi, 2013).

Nevertheless, in spite of the imperative role of quality health service delivery as characterized above, the health service delivery in Uganda is poor (Nabukeera, 2016). Lack of trained human resources, poor organization of health services, and drug inadequacy, dilapidated health infrastructure systems among others have combined in services, and drug inadequacy, dilapidated health

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infrastructure systems among others have combined in numerous proportions to weaken the health service quality (Nabukeera, 2016; Wane and Gayle, 2013). This condition has continued in spite of several reforms such as improved training health institutions, improved health service management system, more fund allocation by various funding organizations, revamped health infrastructures, improved drug management approaches, enhanced health models, upgraded remuneration systems among others (Nabukeera, 2016; WHO, 2015; UNHCO, 2014).

Health service quality in Uganda is underpinned by the Health Sector Strategic Plan (HSSP) with an objective of improving the health of every person in a manner that is legitimate and quick to respond to their health needs. This is further articulated in the vision 2040 blueprint for example, that aims at enabling government to transform its society and provide citizens with better standard of living by focusing on improving quality health. Despite this, poor service delivery in the health sector has evidently persisted (MOH, 2013).

Health service delivery in Uganda is often characterized by weak public health systems (Nabukeera, 2016; UNHCO, 2014). Besides, an audited report published in 2016 by Auditor General on local authorities in Uganda show that health services offered in Greater Iganga Local Government is unsatisfactory (Office of The Auditor General, 2016). The aforementioned report and studies indicate deficient and dilapidated infrastructure, questionable drug inventory techniques and quality, unreliable staff, unqualified and limited human resources among others. Consequently, there has been increased mortality rate, low life expectancy, questionable health conditions, lack of trust in health systems among others (MOH, 2013; WHO, 2015).

In view of the aforementioned, internal control has been regarded a distinctive factor to enhanced health quality service delivery (Wane and Gayle, 2013; Ntongo, 2012). Internal control is a system that is guided by a framework invented to reliably assure the organization that its purpose for existence will be achieved (COSO, 2013). The frame between internal control and quality health service delivery is well explained by stakeholder theory (Freeman, 1984). This theory explains how organizations, people and the group relate to one another. This theory assumes that an organization is comprised different stakeholders and each stakeholder has differing interests which need to be taken into account if the organization is to achieve its purpose (Shao, 2010). Guided by stakeholder theory, Greater Iganga Local Government needs to identify and incorporate needs of stakeholders such as clients, government, funding agencies and employees in order to improve on the quality of services they deliver. In spite of the effectiveness of internal control in improving quality health service delivery in the health sector (Ntongo, 2012), this link has not been empirically tested in Uganda's public health sector.

The closest was by Ntongo (2012) however, this was in private sector. The absence of a similar study in the public sector necessitates this study. Furthermore, empirical evidence indicates that such test in the realm of Greater Iganga Local Government is subtle.

LITERATURE REVIEW

Internal control and quality service delivery in organizations

Internal control has been pointed out as unique and essential to the success of organizations (Synder et al., 1989; Pillai, 2010). Internal control is a process guided by the organization's framework that reliably assures the entity that its purpose for existence will be achieved (COSO, 2013). The rationale is that the stakeholders are demanded to provide framework that safeguard resources, promote consistent information, enhance adherence to recommended laws and meet effectively the operations of the organization. Conceptually, internal control is comprised five interconnected components: control environment, risk assessment, control activities, information and communication, and monitoring activities (COSO, 2013). There effective implementation safeguard resources against loss, misuse and damage (Long and Jeremy, 2013; Brent, 2010). This requires each organization to adopt internal control that is appropriate to its particular needs and activities (MWE, 2018).

Literature exhibits the significant role of internal control in quality service delivery. Effective internal control enhances desired service quality (Ntongo, 2012). In this regard, organizations with well-structured internal control improves performance and meets client's expectations (Oppong et al., 2016; Umar et al., 2018). This translates into quality service delivery. Internal control promotes efficiency in utilization of organization resources whereby jobs are carried out as described, employees available at work at all times, and equitable allocation of resources and hence, timely service quality delivery (MWE, 2018). Similarly, internal control has a potential to ensure usage of funds on planned organizational activities, investment of idle funds, and regular monitoring of utility (Oppong et al., 2016). Monitoring is an important driver to quality service delivery. It provides vital feedback on the extent of service delivery and whether delivery of those services makes any difference both to clients and organization (Rossi, 1993). Besides, it provides insights which are useful for detecting changes in performance and understanding trends over time (Woodall et al., 2015). The objective is to ensure that organization is functioning as envisioned and that their systems are enhanced to proactively respond to variations to gain competitive advantage (Long and Jeremy, 2013). Comprehensively, monitoring measure if the core objective spelt out in the description of the organization core existence is being

achieved (Long and Jeremy, 2013)

Similarly, organization's aptitude to make better resolutions that reciprocate desired outcome is influenced by the good information (COSO, 2013), thus, information must be suitable, well-time, up-to-date, exact, and available (COSO, 2013). Moreover, for information to meet its purpose, it must be communicated to the intended persons (Long and Jeremy, 2013). As communication is enhanced, there is a possibility that service quality will improve as organizations become more focused on clients requirements and needs (Musenze et al., 2014; Mwazo et al., 2017). This positions communication as a unique predictor to QSD (Musenze et al., 2013; Mwazo et al., 2017). Furthermore, communication is seen to be important in all quality service delivery practices. Complete and timely communication, simplifies employees tasks thereby incorporating their needs and meet them as required (Musenze et al., 2013). This means that all communication practices must be controlled in order to realise better outcome.

Effective control activities have been positioned as a key to performance (QSD) (Oppong et al., 2016). Service quality is reliant on insight of organizational control activities. Effective and efficient processes (internal activities) directly impact quality of service delivery (World Meteorological Organization (WMO), 2014). In this view, control activities are considered as activities that provide evidence on the status of the organization and actions to be taken. The said actions must be supported by internal control objectives, procedures and policies that enable managers to address risk timely, effectively and efficiently (COSO, 2013) as cited by Oppong et al. (2016). According to Australian Council of Healthcare Standards (ACHS, 2018), COSO (2013), and Long and Jeremy, (2013), risk assessment is important in mitigating risks towards realization of service quality. Risk assessment and service quality, are not isolated processes (Mwazo et al., 2017). They provide a system through which organization's operations are assessed, the processes involved examined, and enhance its performance in an effort to foster service quality (COSO, 2013; ACHS, 2018). Evidence showed that organizations that have successfully implemented risk management reciprocated quality improvements scenario (Umar et al., 2018; ACHS, 2018; Mwazo et al., 2017). This programme to be functional, organizations (Lgs) need to exhibit allegiance to the procedures stipulated and define the objectives of all participants. Similarly, governing authority must allocate adequate resources to proficiently lessen, regulate and govern all risk in the organization (ACHS, 2018; COSO, 2013). The reviewed literature demonstrates internal control as a considerable indicator of quality service delivery in organization (Mwazo et al., 2017; Pillai, 2010). Therefore, it is hypothesized that:

H₁: Internal control is positively linked to quality health service delivery in Greater Iganga Local Government.

Service quality

Service quality reveals the general judgement as to whether service offered meets client's contentment (Parasuraman et al., 1988). According to Zeithmal et al. (1990), service quality is the variance obtained from what customer anticipate and the results received. Furthermore, in some scenarios, clients' anticipation surpasses performance of services received leading to discontentment (Parasuraman et al., 1985). Nevertheless, Philip and Hazlett (1997) point out that as much as SERQUAL model (Parasuraman et al., 1988) is universally used, there is dissatisfaction that the present operationalization of service quality is highly inadequate, besides, it may in fact be flawed more especially in evaluating the quality service offered in other service organizations, namely: database service, education, hospitals/healthcare, libraries, or information services. Furthermore, it is uncertain as to whether SERQUAL measures service quality or satisfaction (Philip and Hazlett, 1997). On the other hand, SERPERF model (Gronroos, 1984) measured service quality based on the test of qualitative methods. Conversely, Philip and Hazlett (1997) suggested a hierarchical model known as pivot-core-periphery model for assessing service quality in service sector. This model exhibits the distinction between the service delivered, workforce and the organization delivered of the service. Moreover, P-C-P model only holds the employee(s) and organization accountable for service delivery and the proof as to whether service delivered is of quality and met the intended purpose depends on the client (Philip and Hazlett, 1997). Similarly, P-C-P model allocates divergent intensity to the quality service measurements. Therefore, to assess service quality, judgments of all measurements of the service: input, processes and outputs should be put into consideration (Musenze et al., 2014).

Conceptual framework

Ascending from reviewed literature and theories, the model shown in Figure 1 was proposed to guide this study.

Hypothesis development

Ascending from the reviewed literature and the model (Figure1), the following hypothesis was formulated:

H₁: Internal control is positively linked to quality health service delivery in Greater Iganga Local Government.

MATERIALS AND METHODS

Study design, sample and sampling technique

This study utilized cross-sectional research design. Data was

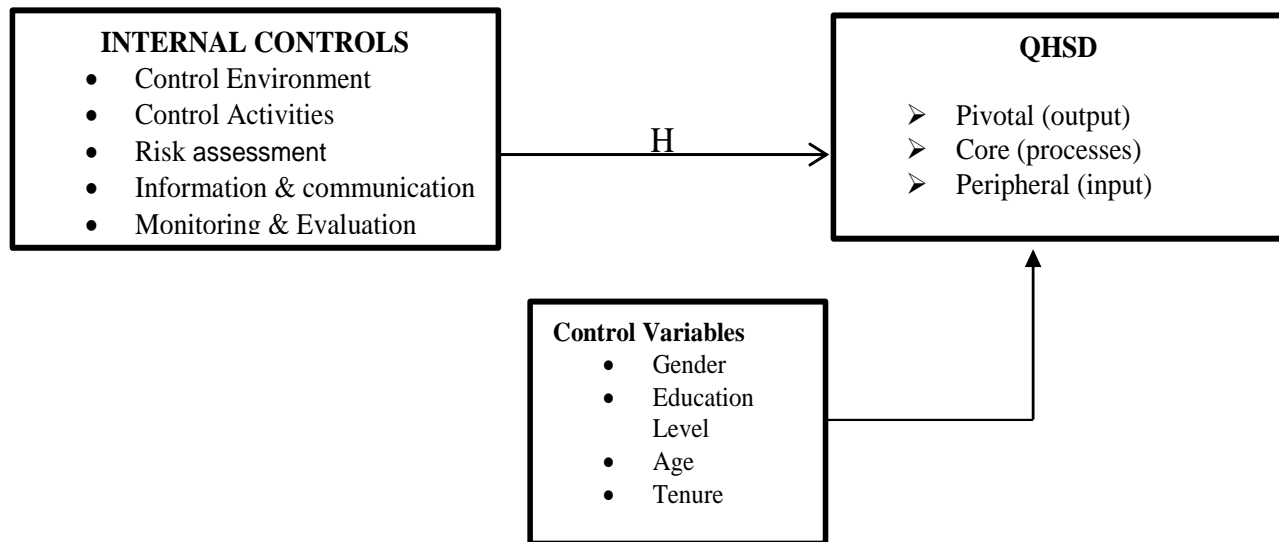


Figure 1. Conceptual framework showing the relationship between internal controls on quality health service delivery.

collected from a sample size of 127 health facilities out of 205 health facilities from Ministry of Health, as advised by Krejcie and Morgan (1970) for determining sample size. As Greater Iganga Local Government (Mayuge, Bugiri, Namutumba, Luuka, Namayingo and Iganga districts), health sector is ranked along different tiers (HCIIIs, HCIIIs, HVs and Referral Hospitals), stratified sampling technique was applied in selecting 1 Referral Hospital, 4 HC IVs, 22 HC IIIs, and 100 HC IIs. Subsequently, employing simple sampling technique, four bowls marked with layer's name were provided. All designations of units of analysis (HCs) were labeled on a paper and placed on those corresponding bowls as per the layer's name, from which we draw the required samples without replacement until the sample size of 127 was attained. This sample size fulfilled the required threshold of 100 and above as recommended by Bailey (1994). Questionnaires were self-administered to 635 respondents. Given that the clients are in the best position to judge as to whether service delivered is of quality and met the intended purpose (Philip and Hazlett, 1997), the QHSD part of the instrument was answered by 635 respondents who were registered through a convenient sampling technique. Clients departing from public health centres were intercepted, persuaded, and asked to take part in the study by answering the items in the instruments. All their responses were aggregated to the unit of analysis level (Health Centres). Conversely, the accounting managers, health managers, superintendent of health centers, health supervisors, health instructors, drug supervisors, laboratory officers, personnel managers and drug stock administrators formed the unit of inquiry on internal control.

Measurements of variables

Internal control

To unearth the realm of internal control, two internal control models were reviewed: COSO model (COSO, 2013) and Long and Jeremy (2013). According to COSO (2013), internal control is comprised five measurements: control environment, risk assessment, control activities, information and communication, and monitoring activities. On the other hand, Long and Jeremy extracted eight dimensions namely: control environment, monitoring and evaluation, arrival and

customs clearing, transportations, receiving, storage distribution and people (Long and Jeremy, 2013). However, the emphasis was limited to pharmaceutical management systems and operationalization, but not other organizations. Therefore, to excavate the dimensions of effective internal control in health service organizations, this study zeroed down to COSO model. The items in the COSO model were adjusted to fit this study. For validation purposes, the items in the tool were acquiesced to 10 specialists comprising both local government practitioners and academicians. The content validity index was established to be above 0.80. This was beyond the suggested minimum of 0.70 (Nunnally, 1978). Items were anchored on a five-point Likert-like scale (1-5) ranging from Strongly Disagree to Strongly Agree. The adjusted questionnaire had 50 items.

Quality health service delivery

P-C-P model established by Philip and Hazlett (1997) was utilized. In this context, the QSD measurements encompassed output, process and input. The uniqueness with this model is that it holds the personnel and organization accountable for service delivery and the proof as to whether service delivered is of quality and met the intended purpose depends on the client (Philip and Hazlett, 1997). For validation purposes, the items in the tool were acquiesced to 10 specialists comprising both local government practitioners and academicians. The content validity index was established to be above 0.80. This was beyond the suggested minimum of 0.70 (Nunnally, 1978). Items were anchored on a five-point Likert-like scale (1-5) ranging from Strongly Disagree to Strongly Agree. The adjusted questionnaire had 23 items.

Validity and reliability

For validation purposes, the items in the tool were acquiesced to 10 specialists comprising both local government practitioners and academicians. All study variables registered a content validity index which was established to be above 0.80. This was beyond the suggested minimum of 0.70 (Nunnally, 1978).

Similarly, the reliability scale of the two scales of internal control

Table 1. Reliability statistics.

Variable	Cronbach's alpha coefficient α	No. of items
IC	0.868	50
QHSD	0.879	23

Source: Primary data.

Table 2. Zero-order correlation results between internal control and quality health service delivery.

Variable	QHSD
Quality Health Service Delivery	1.00
Internal Control	0.715**

Source: Primary data, N= 127; **p < 0.01 (one-tailed).

and QHSD were also established using Cronbach Alpha Coefficient as generated by Statistical Package for Social Scientists (SPSS). Cronbach Alpha coefficient for all the study variables were above 0.85. This was well above the recommended minimum requirement of 0.70 (Nunnally, 1978). Therefore, the scale for measuring Internal Control and Quality Health Service Delivery was reliable as demonstrated in Table 1.

Data processing and analysis

Quantitative technique was utilized in the analysis of data. Data obtained from the questionnaires were edited, coded, characterized and analysed using Statistical Package for Social Sciences (SPSS), computer software. Statistical analysis resulted from SPSS handling of data from questionnaire was presented for discussion.

RESULTS

Correlation and regression analysis

Pearson's product moment correlation coefficient and regression analysis were used to assess the link between the study variables. The statistical results are shown in Table 2.

The generated correlation results displayed in Table 2, demonstrate a positive and significant ($r = 0.715$; $p < 0.01$) link between internal control and quality health service delivery. The model evaluation results exhibited in Table 3, point out that Model 1 is statistically insignificant ($R^2 = 0.034$; $p > 0.05$). Given that demographic measurements have formerly remained utilized as control variables in studies (Min and Khoon, 2014; Al-Khali and Mahmoud, 2012), in Model 1, the control variables were controlled (gender, age, educational level and tenure). The findings show that control variables explained 3.4% of the overall variation in QHSD, suggesting that the support of demographic measurements to QHSD in Greater Iganga Local Government is statistically insignificant ($R^2 = 0.034$; $p >$

0.05). Conversely, regression analysis outcome, showed in Table 3: Model 2, discovered that 53.2% of the overall variation in QHSD is illustrated by internal control ($R^2 = 0.532$; $p < 0.001$). The regression coefficient of change in QHSD due to a change in internal control was significant ($\beta = 0.724$; $t = 11.340$; $p < 0.001$). Based on the correlation results ($r = 0.715$ $p < 0.01$), strengthened by regression analysis results ($R^2 = 0.532$; $p < 0.001$), and regression coefficient ($\beta = 0.724$; $t = 11.340$; $p < 0.001$), hypothesis (H_1) is upheld.

DISCUSSION

The study assessed the relationship between internal control and QHSD in Greater Iganga Local Government. The study established that the link between internal control and QHSD was positive and significant. This finding is in consonant with Synder et al. (1989), Pillai (2010), Ntongo (2012), Oppong et al. (2016) and Umar et al (2018), suggesting that as organizations enforce policies and procedures such as the presence of the frameworks that safeguard resource, compliance to the stipulated laws, better reporting systems, risk assessment, proactive monitoring and evaluation and regular auditing exercises, the quality of healthcare is likely to recuperate as organizations (Lgs) aim to meet the requirements of their esteemed clients, they will quickly respond to arising issues proactively in an effort to realize exceptional outputs, processes and inputs.

Conclusion

The study examined the effect of internal control and QHSD in Greater Iganga Local Government. It was found out that the link between internal control and QHSD was positive and significant. Therefore, it is imperative to note that internal control plays a pivotal role to improve QHSD.

Table 3. Regression results of the effect of internal control on QHSD.

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.	R Square	Adjusted R Squared	ΔR^2	ΔF	Sig. ΔF	
	B	Std. Error	Beta								
1	Gender	0.052	0.178	0.029	0.275	0.782	-	-	-	-	
	Age	-0.018	0.143	-0.017	-0.144	0.891	-	-	-	-	
	Educational Level	0.233	0.154	0.139	1.458	0.143	-	-	-	-	
	Tenure	-0.156	0.118	-0.144	-1.346	0.175	0.034	0.000	0.024	1.821	0.175
2	Gender	-0.040	0.125	-0.021	-0.332	0.749	-	-	-	-	
	Age	0.082	0.101	0.053	0.814	0.434	-	-	-	-	
	Educational Level	0.114	0.109	0.069	1.045	0.286	-	-	-	-	
	Tenure	-0.259	0.083	-0.249	-3.149	0.003	-	-	-	-	
	Internal Controls	0.955	0.088	0.724***	11.340	0.000	0.532	0.513	0.498	129.825	0.000

Source: Primary data, N= 127, ***p< 0.001, Dependent Variable: QHSD.

Given this deliberation, this study supplements to the service literature by positioning internal control as an important precursor to QHSD within the setting of Uganda in the perspective of GILG.

In spite of the fact that this study has demonstrated valuable comprehension to relevant stakeholders, it is also limited in the following ways:

(1) The findings resulted from cross-sectional study design, making it challenging to validate conclusion in relation to other study designs. Consequently, upcoming studies ought to think through the same study in respect to other research design perspectives such as longitudinal design among others.

(2) The study was done within the setting of Uganda Local Government. The findings maybe limited due to geographical location. Thus, it is suggested that the future studies ought to ponder on a similar study by testing this model in a local authority(s) elsewhere.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Supply chain management constraints in Tanzanian small and medium enterprises

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Supply chain management (SCM) has gained popularity around the globe due to its significance in relation to improving business performance. Although large enterprises have been able to successfully implement SCM, it is different in small and medium enterprises (SMEs) as they are faced with several constraints that hinder the effective implementation of SCM. Variables such as technological difficulties, poor coordination with the supplier's lack of government support, resources, funds, access to markets and top management support, issues in information sharing, inventory management, poor SCM knowledge and unskilled workforce all affect the SCM implementation in SMEs. These variables were measured in this study. A mixed method approach was used in this study where content analysis was employed through carrying out an extensive literature review to identify the SCM constraints. Descriptive statistics were then used to justify the relationship between SCM impediments and effective SCM implementation in Tanzanian SMEs. Frequency and percentages were computed to obtain the study results. The findings reveal that there is a significant relationship between effective SCM implementation in Tanzanian SMEs and constraints such as technological difficulties, poor coordination with suppliers, a lack of support from the top management and insufficient funds. This indicates that Tanzanian SMEs are mostly constrained by technological difficulties, poor coordination with their suppliers, a lack of support from top management and insufficient funds. The results also revealed that information sharing, inventory management, a lack of access to markets and poor SCM knowledge were insignificant constraints affecting SCM implementation in Tanzanian SMEs, thus indicating that there are no significant relationships between these constraints and SCM implementation in Tanzanian SMEs. The study recommends that support from the government in terms of financial assistance could help the SMEs to overcome the financial constraints and to invest more in recent technologies to help effectively implement SCM. Training from SME governing bodies such as the Small Industry Development Organisation (SIDO) in Tanzania could help to increase awareness of the importance of SCM. Furthermore, forming and maintaining long-term relationships with suppliers is critical for effective SCM implementation.

Key words: Supply chain management, Small and medium enterprises, firm performance, Tanzania.

INTRODUCTION

The small and medium enterprises (SME) sector in Tanzania has been recognized as an important sector that significantly contributes to economic development through creating employment opportunities, generating

income, fostering industrial development and alleviating poverty. In Tanzania, SMEs are defined based on the number of employees and capital required to start a business. A small firm in Tanzania is, therefore, any

business with employees totalling between five and nine with a minimum capital of Tanzanian Shillings (TZS) of 5 million and a maximum of 200 mils. A medium enterprise is any business with employees totalling between 10 and 99 with a minimum capital requirement of 200 million TZS and a maximum of 800 mil TZS. In Tanzania, it is estimated that 95% of businesses are SMEs and they contribute to 35% of Gross Domestic Product (GDP).

Although several measures have been undertaken by the government to promote the SME sector, SMEs in Tanzania are still inhibited by a number of constraints, especially in their supply chains. A number of previous studies have identified the SCM constraints facing businesses in Tanzania such as low SCM knowledge, poor inventory management, a lack of proper pricing strategies, technology-related issues, a lack of R and D, a lack of capital investments, managerial incapability, poor infrastructure, poor storage facilities, a lack of integration and a lack of transparency in sharing of information (Mollel, 2015; Ekblom 2016). However, despite multiple SCM impediments being identified, there is still a lack of reporting on what issues exactly impact SCM in SMEs. Furthermore, the diverse issues identified could be difficult to address given the scarcity of resources in Tanzania. This study, therefore, aims to assess SCM issues in Tanzanian SMEs and it intends to suggest ways of addressing these challenges.

LITERATURE REVIEW

Supply chain management (SCM)

Several authors have defined SCM in a number of ways. Christopher (2016) defines SCM as the management of both upstream and downstream member relationships, namely with suppliers and customers, to deliver customer value at a minimal cost. Others have defined SCM based on themes such as network and process. For example, Nguegan and Mafini (2017) defined SCM as the process of planning and managing all activities involved in the procurement of materials, converting these to final products and distributing them to the final consumers. Brandenburg et al. (2014) defined SCM as the management of network relationships within and outside of the organisation to ensure that materials and information flow smoothly across the supply chain in order to meet customer expectations. For the purpose of this paper, my understanding of SCM is based on the definition given by CSCMP. According to Cscmp.org (2019), "SCM involves the planning and management of all activities from sourcing raw materials through producing these and delivering them to the customers. It also includes coordination between the supply chain

partners such as suppliers, customers, intermediaries and third-party customers. Additionally, SCM integrates supply and demand across firms."

SCM has increasingly gained popularity in firms due to its ability to increase the competitive advantage. Numerous studies have documented the benefits of SCM. Liu et al. (2016) noted that SCM improves delivery time and the management of inventories. Eckstein et al. (2014) suggests that SCM helps firms to adopt agility, which in return positively affects both costs as well as operational performance. Ali et al. (2019) found that SCM positively and significantly helps SMEs to obtain liquidity, working capital and to improve member relationships. Notwithstanding the benefits of SCM in organisations, various studies have documented the impediments that stand in the way of successful SCM implementation.

Therakorn (2014) reported that resistance to change from the employees, low employee SCM knowledge and a lack of skills, insufficient support from management, ineffective IT systems, deficiencies in implementing SCM strategies, the inability to manage relationships with their partners, poor collaboration and a lack of trust among the supply partners constitute the challenges of effective SCM implementation in SMEs in Thailand. Recently, Litke et al. (2019) found that firms still face issues in information sharing in their supply chain while using blockchains. Muchaendepi et al. (2019) study on the mining sector in Zimbabwe showed an absence of structural and organisational change needed to support sustainable SCM implementation. Furthermore, Bimha et al. (2019) revealed that firms in Zimbabwe face SCM constraints such as an unfriendly business environment, a restrictive tax regime, a poor regulatory system, a lack of stable government policy, financial constraints, poor procurement and inventory strategies and poor logistics and communication. Al-Esmael et al. (2019) found that a shortage of incentives, short-term objectives, a lack of cooperation, poor willingness among the supply chain partners and financial, managerial and technological constraints to be issued impeding SCM in SMEs in the Gulf countries. Manville et al., (2019) found that supplier issues affect better SCM in UK aerospace SMEs. Yang et al. (2019) reported financing constraints to be the major issue impacting the supply chain in SMEs. In Tanzania, Mollel (2015) found that information sharing and outsourcing negatively impacted SCM in food firms in Tanzania.

Selected studies from around the globe addressing SCM issues

To find out the SCM constraints present in Tanzanian, 15

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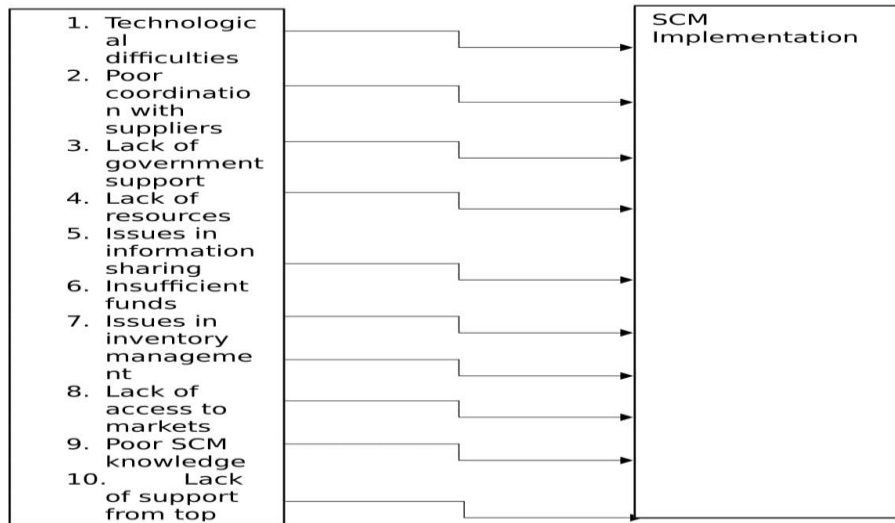


Figure 1. Conceptual framework.
Source: Literature review (2019).

studies were reviewed where the variables were extracted and measured. The studies reviewed have been presented in Table 1.

Conceptual framework

Based on the literature review, several impediments affecting SCM implementation in Tanzanian SMEs have been identified. The main constraints in this study are as follows. The dependent variable for this research is SCM implementation and the independent variables for this research are technological difficulties, poor coordination with suppliers, a lack of government support, a lack of resources, issues in information sharing, insufficient funds, issues in inventory management, a lack of access to markets, poor SCM knowledge and a lack of support from the top management (Figure 1).

Hypotheses

Based on the theoretical conceptual framework, the relationship between SCM constraints and SCM implementation can be hypothesised as follows:

H1 - There is a negative relationship between technological difficulties and SCM implementation in SMEs

H2- There is a negative relationship between poor coordination with the suppliers and SCM implementation in SMEs

H3- There is a negative relationship between a lack of government support and SCM implementation in SMEs

H4- There is a negative relationship between a lack of resources and SCM implementation in SMEs

H5- There is a negative relationship between issues in information sharing and SCM implementation in SMEs

H6 - There is a negative relationship between insufficient funds and SCM implementation in SMEs

H7- There is a negative relationship between issues in inventory management and SCM implementation in SMEs

H8- There is a negative relationship between a lack of access to markets and SCM implementation in SMEs

H9- There is a negative relationship between poor SCM knowledge and SCM implementation in SMEs

H10- There is a negative relationship between a lack of support from the top management and SCM implementation in SMEs

H11- There is a negative relationship between unskilled employees and SCM implementation in SMEs

METHODOLOGY

In this study, a mixed method approach was adopted where content analysis as well as descriptive statistics was used. A thorough review of the SCM constraint implementation literature was carried out to identify the frequently cited constraints affecting SCM implementation which was thereafter followed by descriptive statistics. A mixed method approach was deemed to be appropriate as it allowed the researcher to investigate the phenomenon at hand adequately. As suggested by Almalki (2016), the use of mixed methods enables the researchers to significantly address the research problem by removing bias that can be obtained through the use of a single method. Therefore by employing this method, the researcher was able to gather information on the SCM implementation constraints through reviewing the literature and thereafter examining the descriptive statistics in the form of frequencies and percentages. This allowed the researcher to

Table 1. Selected SME studies from around the globe.

Title	References	Major findings
Coordination and responsiveness issues in SME supply chains: a review	Kumar and Kumar (2017)	Lack of resources, poor innovative capabilities and poor coordination with supply chain partners
Main difficulties hindering supply chain performance: an exploratory analysis of Uruguayan SMEs	Tanco et al. (2015)	Telecommunications infrastructure, government policies, political environment, workforce availability and productivity, supply-side problems, poor integration, a lack of commitment from the top management and a lack of flow of information and materials.
Logistics and Supply Chain Related Issues Faced by Malaysian SMEs: A Case Study	Abdullah et al. (2016)	Customer service and inventory management issues
Critical success factors for the implementation of supply chain management in Indian small and medium enterprises and their impact on performance	Kumar et al. (2015)	Lack of resources and direction
Challenges to the Adoption of E-commerce Technology for Supply Chain Management in a Developing Economy: A Focus on Nigerian SMEs	White et al. (2014)	Technological difficulties
Factors Affecting Collaboration in Supply Chain: A Literature Review	Hudnurkar et al. (2014)	Issues in information sharing
Supply Chain Management Practices in Thai SMEs: Antecedents and Outcomes	Therakorn (2014)	Resistance to change from employees, the employees' lack of understanding, a lack of commitment from the top management, ineffective IT systems, unstable operational processes, the insufficient ability to manage their network partners and a lack of trust among supply chain partners
A multi-agent architecture for outsourcing SMEs manufacturing supply chain	Kumari et al. (2015)	Lack of resources, technical issues, relevant market information, insufficient funds and a lack of government support
The Causes of the Failure of New Small and Medium Enterprises in South Africa	Fatoki (2014)	Lack of management experience, high cost of distribution, poor logistics in the supply chain
Supply Chain Management Practices and Challenges: Case Studies of Four Supply Chains	Talavera (2015)	Lack of supply chain planning, information technology, increased lead times, supply and demand uncertainty and logistics capacity.
Examining the Most Severe Logistics and Supply Chain Issues Experienced by Malaysian SMEs	Abdullah et al. (2018)	Difficulties and inaccuracies in forecasting inventory, inability to fulfil orders due to inventory shortages and keeping the wrong mix of inventories.
Supply Chain Collaboration among SMEs in Kenya: A Review of Collaboration Barriers	Gumboh and Gichira, (2015)	Competition, inability to get a loan, inability to source skilled labour and a lack of government support as the major problems that SMEs face. Technology barriers, poor networking amongst the important players in the market, a lack of market access, inadequate finances and competition from established firms. Limited capacity for knowledge acquisition, technology management and limited access to capital, in addition to a lack of knowledge, credit and technology barriers.
Supply Chain Partnership, Collaboration, Integration and Relationship Commitment as Predictors of Supply Chain Performance in South African SMEs	Pfanelo (2017)	Collaboration issues
Socially responsible supply chain management in small and medium enterprises in the GCC	Al-Esmael et al. (2019)	Shortages of incentive, short-term objectives, a lack of cooperation and willingness among the supply chain partners and financial, managerial and technological constraints
Twenty-first century supply chain management: a multiple case study analysis within the UK aerospace industry	Manville et al.(2019)	Supplier issues
Alleviating Financing Constraints of SMEs through Supply Chain	Yang et al. (2019)	Financial constraints

Source: Literature Review (2019).

Table 2. Most extracted SCM impediments.

Article researcher(s)	TD 1	PCS 2	LGS 3	LR 4	IS 5	IF 6	IM 7	LAM 8	PSK 9	LSTM 10	UE 11
White et al. (2014)	X										
Hudnurkar et al. (2014)					X						
Therakorn (2014)	X	X							X	X	X
Fatoki (2014)										X	
Kumar et al. (2015)				X						X	
Kumari et al. (2015)	X		X	X		X		X			
Gumboh and Gichira (2015)	X	X	X			X		X	X		X
Tanco et al. (2015)	X	X	X		X					X	X
Abdullah et al. (2016)							X				
Kumar and Kumar Singh (2017)	X	X		X							
Pfanelo (2017)		X									
Abdullah et a. (2018)							X				
Al-Esmael et al. (2019)	X					X				X	
Manville et al. (2019)		X									
(Yang et al. (2019)						X					

Source: Literature Review (2019).

Key:TD=Technological Difficulties, PCS=Poor coordination with suppliers, LGS=Lack of government support, LR=Lack of resources, IS=Information sharing, IF=Insufficient funds, IM=Inventory Management, LAM=Lack of access to markets, PSK=Poor SCM Knowledge, LSTM=Lack of support from top management, UE=Unskilled employees.

Table 3. SCM impediments in Tanzanian SMEs.

Variable	Frequency	Percentage
Technological Difficulties	7	47
Poor coordination with suppliers	6	40
Lack of government support	3	20
Lack of resources	3	20
Information sharing	2	13
Insufficient funds	4	26
Inventory Management	2	13
Lack of access to markets	2	13
Poor SCM Knowledge	2	13
Lack of support from the top management	5	33
Unskilled employees	3	20

Source: Literature review (2019).

measure the relationship between constraints and overall SCM implementation in Tanzanian SMEs. The variables/constraints of the study were extracted from 15 works of literature addressing SME and SCM from various parts of the world. This was done as the researcher hardly found any literature addressing SME and SCM implementation in the Tanzanian context. The selection of the literature was based on the relevance to the topic and the researcher restricted the literature to within 5 years (2014 - 2019).

A sample size of 15 literature studies was viewed to be adequate in terms of providing the data for the statistical analysis. As noted by previous researchers (Mashenene and Rumanyika, 2014; Mohammed et al., 2013; Ali et al., 2019), a sample size of no less than 12 items of literature is sufficient to extract the variables for analysis.

RESULTS

Based on the literature, the most common extracted SCM impediments have been presented in Table 2. The sign X shows that the variables are critical constraints in the selected articles (Table 3).

DISCUSSION

The results presented in Table 3 reveal that the critical constraints affecting SCM implementation in Tanzanian

SMEs are due to technology denoted by 47%. This means that H1, which states that there is a negative relationship between technological difficulties and SCM implementation in SMEs, has been accepted. Therefore, this can be used to explain that technical difficulties are the most common impediment to successful SCM implementation in SMEs. Additionally, poor coordination with suppliers, a lack of support from the top management and insufficient funds have the second, third and fourth highest percentages respectively. This can be explained by poor coordination with partners and a lack of support from the government resulting in poor SCM implementation. Unskilled employees, lack of resources, and lack of support from the government were found to be marginally significant constraints affecting SCM implementation in SMEs. However, information sharing, inventory management, a lack of access to markets and poor SCM knowledge were all found to be insignificant constraints in terms of affecting SCM implementation in Tanzanian SMEs. The implications of these results are that technological difficulties, poor coordination with suppliers, a lack of support from the top management and insufficient funds are the critical constraints affecting the effective implementation of SCM in Tanzanian SMEs. The findings of this study are in harmony with those of Therakorn (2014) who found top management and IT to be the key factors involved in enabling successful SCM and that issues in these areas negatively affect SCM performance. Furthermore, the findings of this study are in line with those of Gumboh and Gichira (2015), who identified collaboration issues to be standing in the way of effective SCM implementation in the supply chains. In the same way, these findings are evidenced by those of Abdullah et al. (2016), who found inventory management and supplier relationships to be the critical factors impacting the way in which SMEs provide services to their customers. Moreover these findings are in congruence with those of Mollel (2015), who reported that supplier issues such as a lack of trust among the supply chain members stands in the way of effective SCM implementation.

CONCLUSION AND RECOMMENDATION

The purpose of this paper was to identify the challenges impacting effective SCM implementation in SMEs. This paper concludes that technological difficulties, collaboration issues, a lack of support from top management and insufficient funds are the critical factors impacting effective SCM implementation in Tanzanian SMEs. The implications of these findings are that measures need to be taken by the government and SCM practitioners to address SCM-related issues. Such measures include financial support to help SMEs avail the latest technologies and to improve their SCM implementation. Surowiec (2015) found that SMEs fear SCM implementation because they view SCM to be

costly. SME-supporting agencies in Tanzania such as SIDO should provide adequate SCM training to the top management as well as to the SME employees to increase their awareness of SCM benefits and how to effectively implement them. Mollel (2015) suggested that SCM implementation training is vital as most SMEs lack SCM knowledge, which affects its implementation. Furthermore, SMEs should improve their relationship with various partners through fostering transparency and building trust so then the information throughout the supply chain is effectively passed on to avoid the bullwhip effect. Therakorn (2014) reported that SCM partners are crucial for effective SCM implementation. Without such partners, information and materials cannot be successfully passed on through the entire chain and as a consequence, customer needs cannot be met. Through creating a friendly environment with partners in the supply chain, long term relationships can be maintained and the cost can be reduced throughout the supply chain which leads to meeting the customer demands on time.

For future academics, more research using primary data should be carried out to evaluate the effect of technological difficulties, collaboration issues, a lack of support from the top management and insufficient funds on effective SCM implementation. This proposition is due to the fact that through the intensive review, technological difficulties, collaboration issues, a lack of support from the top management and insufficient funds were found to be the critical constraints affecting SCM implementation in SMEs. Future academics should focus on SME and SCM-related issues in various industries in Tanzania such as the manufacturing sector and service sector, as the literature is scarce in these areas on SCM and SMEs in Tanzania. Researchers can also focus on building frameworks on how to help SMEs to improve SCM and perform better. Furthermore, a comparative study of the constraints affecting SCM implementation in Tanzania should be carried out between large enterprises (Les) and SMEs in order to evaluate how the constraints impact SCM implementation.

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CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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