THE DETERMINANTS OF LABOR PRODUCTIVITY IN SOUTH SUDAN MANUFACTURING SECTOR

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DECLARATION

This research paper is my original work and has never been submitted for an award of a degree to any university or another academic institution.

Signature…….. **Date……**

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This Research paper has been submitted for examination with my approval as the University Supervisor

Signature…….. **Date……**

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DEDICATION

I want to dedicate this Research Paper to my beloved mother, Anoon Magai Malou for having brought me to this beautiful world and made me who I am today. I will be forever grateful for her unwavering love and care throughout my studies.

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LIST OF ACRONYMS

AfDB: The African Development Bank

BLUE: Best Linear Unbiased Estimator

CDF: Constituency Development Fund

CLRM: Classical Linear Regression Model

GDP: Gross Domestic Product

ILO: The International Labor Organization

IMF: The International Monetary Fund

ISO: The International Organization for Standardization

OECD: The Organization of the Economic Countries for Development

OLS: Ordinary Least Squares

R & D: Research and Development

SDG: The Sustainable Development Goals

SSNBS: South Sudan National Bureau of Statistics

SSP: South Sudanese Pounds

WB: World Bank

WDI: World Development Indicators

UK: United Kingdom

USD: United States Dollars

VIF: Variance Inflation Factor

LIST OF TABLES

TABLE OF CONTENTS

ABSTRACT

The manufacturing sector is widely believed to play a significant role with a lot of potentialities in driving the economic growth of most of the developing countries through its value addition. However, with regards to South Sudan despite some positive contributions of the sector to the economy, it is still characterized by low labour productivity relative to other developing countries which poses a challenge to the country's desire to achieve SDG by 2030 and South Sudan Vision 2040 on time. Since labour productivity is an important measure of efficiency and competitiveness, rigorous analysis of the determinants of labour productivity is imperative given that there is a dearth of specific studies done on the topic in the country. This study aims to investigate the determinants of labor productivity in South Sudan manufacturing sector. It applies the Ordinary Least Square approach to analyze the labour productivity model using the cross-sectional data obtained from the World Bank Enterprise Survey 2014 database. From the findings, the study reveals that capital intensity, average years of education and medium-sized firm are positive and impact labor productivity significantly. Foreign ownership is also found to be significant however, it exhibits a negative relationship with labour productivity. To improve labor productivity in South Sudan manufacturing sector, the government should increase investment in human capital especially by allocating more resources to boost educational institutions at all levels and enacting some laws of compulsory education across the country. Also, the government should create a favorable environment for the growth and expansion of medium firms by giving them support in terms of more credit to boost their capital needs and reduces their production costs. Furthermore, both the government and firms should channel more resources into investments in physical stock to boost labour productivity. Finally, the government should also create a more conducive environment to attract foreign investors into the country by eliminating any other obstacles that may distract foreigners from investing in the country.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The industrial development has played a pivotal role in fostering the economic growth and development of most economies (AfDB, 2018). The manufacturing sector in particular has profoundly helped in transforming the economies of developing countries through the generation of mass employment opportunities and the GDP. This has subsequently led to the improvement of people's welfare over the years (Kamaku et al., 2016). The growth of this sector is also very useful as it facilitates the growth of other sectors through forwarding and backward linkages. Therefore, it is quite essential to ensure that this sector is well developed (Ngugi, 2019).

In the current era of globalization and increasing competitiveness, the survival of a given firm in any industry largely depends on its productivity which in turn facilitates the economic growth and development (Papadogonas & Voulgaris, 2005). Due to the growing international and domestic trade along with the labour and capital mobility, it is essential for countries to fully understand their labour productivity levels and try to make comparisons to be better engaged in trade. In light of this, developing countries are required to increase their competitiveness in manufacturing products by lowering their unit cost and sell their products at cheaper prices at the international markets (Cobet & Wilson, 2002). Productivity improvement is vital because it enhances rapid output growth (Faruq et al., 2011).

At the global perspective, the contributions of the manufacturing sector to GDP declined gradually in the last two decades from 17.34% in 2004 to 15.43% in 2014 despite the efforts exerted by governments of various countries in the world (World Bank, 2018). Some empirical evidence had shown that insufficient infrastructure, low investment in R & D and low skills were some of the factors that hindered productivity in the manufacturing sector (Biggs et al.,1995; Tybout, 2000). As for Sub-Saharan Africa (SSA), the region has also witnessed some gains from the growth of the manufacturing sector in the recent years as evident by the rise in the exports although it hasn't fully tapped its potentials. Even though the total output has doubled in the last two decades in SSA countries from $53.7 billion in 2000 to $175.9 billion in 2018, the manufacturing sector value-

added as a percentage of GDP declined from 12.6% in 2000 to 10.6% in 2018. In this case, it is evident that the decline in SSA value added is slightly higher as compared to South Asia whose values declined from 15.2% to 14.5% in the same period (WDI, 2019). If productivity continues to decrease for long in SSA, it may affect the region's efforts to achieve sustainable development goals promptly.

Labour productivity is a critical element in propelling the country's GDP growth and understanding it, is imperative. It is the value of output per worker at a given firm level. It measures the efficiency of a firm in turning a given set of inputs into output or service. Labour is considered highly productive when it's value-added is high and vice versa and it can be accessed at both national and firm levels. Aslaninia et al. (2010) argued that labour productivity reflects the firms' profitability, growth and more importantly it determines a firm's competitiveness. There are various ways of measuring the productivity of a given firm such as using capital productivity, total factor productivity, profitability indices and labor productivity. In this case, labour is the most commonly used factor of measuring productivity and considered for this study because it has several advantages over other measurements. For instance, labour cost is usually larger in the value of most of the products, it is easy to measure labour in terms of labour hours, the data on labour is readily available and above all, it measures the welfare of workers (Heshmati & Rashidghalam, 2018).

South Sudan is one of the most oil-dependent economies in the world with the oil sector contributing 61.2% to the total GDP and 65.7% to the total exports in 2011 (SSNBS, 2019). By 2019, the oil sector further accounted for 95% of the total exports. This has made the oil sector to remain the core driver of the economy followed by agriculture and services sectors. However, the manufacturing sector is underperforming and lagged behind other sectors in terms of its contributions to GDP which was just 7% of the total GDP in 2017 (AfDB, 2020) .Furthermore, the employment share in this sector also dropped from 22.8% in 2011 to 15.9% in 2017 (World Bank, 2017). Despite the huge contributions from the oil sector, the total output drastically declined from $19.2 billion in 2011 to $4.58 billion in 2018 and this pushed the real GDP growth to -1.1% in 2018 from its peak of 29.3% in 2013 (IMF, 2019). This decline could be attributed to the effects of the oil production shut down in 2012 following the disputes with Sudan over the oil

transit fees coupled with the outbreak of civil war in 2013 and fluctuations in oil prices. This economic decline may affect the country's desire to achieve sustainable development goals and South Sudan Vision 2040 targets.

In this regard, the country's tendency to rely much on the oil sector alone may not produce sustainable income in the future because it is a non-renewable resource and often susceptible to price shocks. It is essential for South Sudan to improve productivity in other sectors, especially in the manufacturing sector to be able to generate more output and jobs. This study contributes to the literature by using the recent data obtained from the World Bank Enterprise Survey 2014 to analyze the determinants of labour productivity.

1.2 Overview of the Manufacturing Sector in South Sudan

South Sudan got her independence in 2011 from Sudan via a referendum and became the 55th African country. Despite the country being endowed with abundant natural resources most of its sectors including the manufacturing sector were least developed due to the impact of protracted civil wars before and after independence. The country was characterized by low infrastructure, low trained workforce and low raw materials as of 2011. Its economy initially relied on the oil sector for most of its output by accounting for 61.2% of the country's GDP and 65.7% of the total exports; thus making it one of the most oil-dependent countries in the world by 2011 (SSNBS, 2019).

After independence, the government initiated some policies such as Constituency Development Fund (CDF) in 2011, National Development Plans of 2011, Companies Act of 2012 and South Sudan Vision 2040 in an attempt to resuscitate the economy. Nonetheless, these initiatives have not yet achieved their major objectives because they faced numerous hurdles such as the renewed civil war, weak institutions, oil production shutdown, oil price fluctuations and other underlying factors that have not been identified. Consequently, the total output fell from $19.2 billion in 2011 to $4.58 billion in 2018 and real GDP growth rate dropped from its highest peak of 29.3 % in 2013 to -1.1% by 2018 (IMF, 2019). This has led to a drastic decline in per capita income.

Manufacturing sector contributed 7% of South Sudan GDP and 15.9% of the total labour force in 2017 making it one of the important sectors of the South Sudan economy. Despite its contribution,

the sector had been lagging behind other sectors and its value-added per worker declined in recent years. The effects of the protracted wars before and after independence coupled with other factors have exacerbated the impact on the sector. Other sectors such as agriculture, oil, service and others accounted for 10%, 70% and 13% of the total GDP respectively in 2017 (AfDB, 2018).

The value added per worker in the manufacturing sector in South Sudan also declined drastically compared to that of Sub Saharan Africa. According to World Bank, 2018 statistics, it is revealed that the value-added per worker at fixed 2010 US dollars in South Sudan's industry & manufacturing sector was $11,918.32 in 2011, whereas that of Sub Saharan Africa countries was $12,394.13 in the same year. However, by 2016 the value added per worker reduced to $3,108.42 for South Sudan and $11,174.62 for Sub Saharan Africa. A similar decline is seen in other sectors for South Sudan in the same period although the decline is less when compared to that of the manufacturing sector. For instance, service and agricultural sectors value added per worker fell from $3,947.71 and $444.5 in 2011 to $3,511.4 and $400.2 in 2016 respectively (WDI, 2019).

Various sectors of the economy have also played a key role as far as employment is concerned in South Sudan. According to the data from World Bank, 2017 ILO estimates, the agricultural sector has been the leading employment sector in the country with the share of the total labour force being 42.4% in 2011 and 48.94% in 2017. It is preceded by the service sector, which contributed 34.7% and 35.1% to the total labour force in the same period. However, the manufacturing sector offers the least employment opportunities as evidenced by the decline in the labour share from 22.8% in 2011 to 15.9% in 2017 (World Bank, 2017).

From the above information, it can be seen that the contribution of each worker to total output in the manufacturing sector had declined over the years, thus causing the slowdown of economic growth in South Sudan. Since the long-term economic growth depends on the manufacturing sector's ability to create more value-added, it is therefore vital for South Sudan to put much focus on boosting its labour productivity, particularly in the manufacturing sector. This will help the country realize its vision of 2040 of a productive nation. The need to encourage profitability, competitiveness and growth among the firms within South Sudan and in the region necessitates proper attention to labour productivity. This study adopts an individual firm as a unit of analysis.

1.3 Statement of the Problem

The manufacturing sector remains to be a significant driver of economic growth in the long-run in developing countries if its productivity is improved (Ngugi, 2019). Since the industrial revolution era, the manufacturing sector has continued to play a pivotal role in transforming the economies of both developed and developing countries through the mass generation of output and employment opportunities. Consequently, this has led to the improvement of peoples' welfare and heightens the economic growth over the years (Kamaku et al., 2016). Evidence has revealed that long term economic growth depends on the capability of the manufacturing sector to produce more value added (Ngugi, 2019). However, developing countries are still grappling with the challenge to meet the SDG by 2030 due to their low productivity especially South Sudan. Understanding labour productivity in this sector is quite imperative in that it determines the profitability of a firm, its competitiveness and more importantly it reflects the growth of the sector (Papadogonas & Voulgaris, 2005). Therefore, it is crucial to develop this sector.

South Sudan like other developing countries has been characterized by low labor productivity. The manufacturing sector, in particular, has been hit hard as evident by a decline in the value-added per worker at a fixed 2010 United States dollars in the recent years from $11,918.2 in 2011 to just $3,018.3 in 2016. Compared to Sub-Saharan African countries, the value-added per worker is three and a half times lower (WDI, 2019). Consequently, the overall GDP dropped to $4.6 billion in 2018 from $19.2 billion in 2011 as well as a decline in per capita income (IMF, 2019). Low labor productivity is a major concern because it decelerates GDP growth, increases unemployment rate and slows down profits. Furthermore, it is associated with high domestic prices, low purchasing power, reduced capital formation, high cost of production and slows productivity growth (Magati, 2012). These effects have also been experienced in South Sudan. If this decline persists for a longer period, then it may hinder the prospects of the country to achieve the SDGs by 2030 and South Sudan Vision 2040 which calls for an innovative, productive and a prosperous nation.

From the empirical literature, although there are few studies done on labor productivity in the manufacturing sector by previous researchers, there is a dearth of existing literature on the topic in the South Sudan context. Most of the studies done on labour productivity were conducted outside the Sub-Saharan Africa but a few studies which were carried out within the region did not include political instability and corruption as their explanatory variables yet they are also important

factors that can influence labour productivity (Soh & Amin, 2019; Papon et al., 2017). In addition, most of the studies did not use the most recent data (Aslaninia et al.,2010; Papadogonas & Voulgaris, 2005). Despite the few studies undertaken so far, their findings varied significantly from one country to another depending on the context of each country. Therefore, it is still unclear what determines labor productivity in South Sudan's manufacturing firms.

Despite the positive role played by the manufacturing sector to create employment opportunities, there is still rising unemployment rate in the country with the latest figures standing at 12.7% as of 2019 (SSNBS, 2019). Improving productivity in this sector will create more jobs and curb the growing unemployment rate. This paper contributes to the body of literature by identifying the determinants of labour productivity in the manufacturing sector in South Sudan using the recent firm-level data obtained from the World Bank Enterprise Survey, 2014. The findings will provide some policy implications on how to improve the output.

1.4 Research Questions

a) What are the determinants of labour productivity in the manufacturing sector in South Sudan?
b) What are the policy implications to enhance labor productivity in the manufacturing sector in South Sudan?

1.5 Objectives of the study

The main objective of this study is to investigate the determinants of labour productivity in the manufacturing sector in South Sudan and more specifically:

a) To analyze the determinants of labour productivity in the manufacturing firms in South Sudan.
b) To provide policy implications using the findings from this study.

1.6 Significance of the study

The manufacturing sector has played an important role in the economy of South Sudan by contributing to GDP and employment creation yet little information is known about its labor productivity's determinants. To draw better policies that can improve labor productivity in the manufacturing sector, it is quite imperative to understand clearly the factors which influence labor productivity. This study established that foreign-owned firms showed a lower labor productivity than their domestic counterparts perhaps due to the associated high initial cost of production. This information shall be useful to policymakers who need to create a conducive environment that lowers the high initial costs of assimilating the new plants and other subsequent costs of production in order to boost the labor productivity of foreign firms.

From the findings, the study also revealed that capital intensity, average years of education and medium-sized firms were important determinants of labor productivity. This information will be beneficial to policymakers and private manufacturing firms who can formulate policies on how to improve labor productivity in the country. In this case, they shall be required to channel more resources for further investments at all levels of educational institutions and ensure that they are fully equipped to enhance learning. Besides, they should invest more in physical capital and encourage the expansion of medium-sized firms across the country. Improvement in labor productivity in the manufacturing sector will eventually lead to increased profits, enhances economic growth and competitiveness. Hence, this will propel the country to achieve SDGs and South Sudan Vision 2040 targets promptly. This study will also act as basic literature on the determinants of labour productivity in the manufacturing sector in South Sudan after using the most recent data from World Bank Enterprise survey, 2014. Areas for further research highlighted shall be useful to future researchers who might be interested to research further on the topic.

1.7 Organization of the study

This study is organized as follows. The preceding chapter presented the introduction which consisted of the background, statement of the problem, the research questions, the main objective, the significance, and the organization of the study. Chapter two provides a brief review of the literature while chapter three describes the methodology of the study. Chapter four shows the findings of the study while chapter five presents the summary, conclusion, recommendations and areas for further research.

CHAPTER TWO: LITERATURE REVIEW

2.1Theoretical Literature

2.1.1 Theory of Production

The theory of production attempts to explain how a given firm makes decisions on how much of commodities it sells or produces and how much of raw materials it employs or it will use. This theory is expressed in the form of production function which shows a technical relationship between the number of physical inputs and outputs changes using a given technology. This relationship is expressed in form of a general production function given by:

$$\mathbf{Y = f(K, L, M, \dots, Z)} \qquad (\mathbf{1})$$

Whereby **Y** stands for the firm's output, **K**, **L** and **M** represent physical capital, labour and material inputs respectively. **Z** stands for other factors that affect the production process. The most widely used production function is adopted from Cobb & Douglas, (1928). This function expresses the technical relationship between output and two or more inputs that is physical capital and labour. It also assumes a constant return to scale and a perfect competition (Cobb & Douglas, 1928).

2.1.2 Adam Smith theory of labour productivity

This theory is attributed to Adam Smith, (1766) who emphasized the indispensable role of the division of labour towards labour productivity. According to Smith, the division of labour creates an enabling environment for workers to improve their expertise, skills, innovativeness and as well as increase labour productivity. It makes workers more efficient in producing goods and services. He added that the division of labour is useful because it saves time, augments workers' skills, enhances workers' expertise and indeed encourages innovation.

Smith also argued that division of labour encourages specialization of workers which in turn spurs labour productivity. The reason being, the workers will focus all their efforts in doing one particular task at a given time without moving from one task to the other hence mastering their professions. Specialization also accelerates industrial development. Smith also noted how the market size, which in turn depends on the economic growth of a country, restricts the division of labour. This implies that engaging in more trade especially the external one may lead to more division of labour and subsequently increases labor productivity. However, a specialization, which

Smith advocated for makes the assigned tasks monotonous and reduces the workers morale which again lessens the labour productivity (Smith, 1776).

2.1. 3 Theory of Human Capital

Human capital also contributes significantly to output the same way the physical capital does and with changes in technology, it encourages innovation and learning by doing (Aggrey et al., 2010). The human capital theory asserts that investment in education imparts to workers the necessary skills and knowledge which enables them to raise their productivity. This theory is attributed to the initial works of Schultz, (1961), Becker, (1964) and Welch, (1970). It is based on the assumption that education increases the marginal productivity of workers. These scholars introduced the human capital variables namely training and education into their models. They argued that both training and education equip workers with needed skills and knowledge which increases their productivity.

Schultz, (1961) stressed the profound role of education which enables workers to acquire a set of skills and knowledge that makes them more productive. Becker, (1964) also argued that when workers undergo formal education and training, they become better equipped with necessary skills, knowledge and experiences that increases their productivity. Welch, (1970) argued that education has several effects among them include the workers and the allocative effects. With regards to workers effect, better-educated workers are more efficient in resources utilization than less educated ones and that education increases the marginal productivity of workers. Concerning the allocative effect, highly educated workers can allocate well all the input factors among the various alternative uses.

2.1.4 Fredrick Tailor's Motivation Theory

Taylor, (1998) was concerned about finding the most efficient ways of doing the job by his workers. He had observed that there were some weaknesses in the management system which caused inefficacies. He identified some key things a good manager should apply to ascertain smooth functioning of the industry and ensure perpetual labour productivity which includes conducting training of selected workers to be able to perform their duties well, breaking down the working steps into smaller parts that can be handled easily, establishing a system of accountability between the workers and the management, targeting efficiency through cooperation and

monitoring of workers by managers and paying workers according to their levels of contributions as a way to motivate them.

According to Taylor, (1998), the cooperation between workers and managers will encourage them to discharge their tasks more efficiently. He advocated that managers should increase workers' wages as this can easily motivate them to perform better. Despite the positive contributions of the theory, some scholars criticized it as dehumanizing, creates monotonous works and benefits managers more than the workers instead of both.

2.2 Empirical Literature

Konings & Vanormelingen, (2015) analyzed the impact of job training on wages and productivity in Belgian manufacturing enterprises using panel data for a period 1996-2006. Their findings revealed that firms, which were able to train their workers, were associated with greater labour productivity than an increase in wages. In this case, a 1% rise in the number of trained workers led to an increase in effective labour inputs from 1.7% to 3.2% ceteris paribus. Nevertheless, a 1% increase in training would increase wage just slightly from 1% to 1.7% holding other factors constant. These outcomes are consistent with results from similar research done by Dearden et al., (2006) in Britain who found that a 1% unit increase in trained workers resulted to 0.6% increase in labour productivity and raised wages by 0.3%. They concluded that training increases labour productivity more than it does to wages due to imperfect competition from wages adjustments and the labour market.

Aslaninia et al. (2010) using descriptive analysis investigated the determinants of labour productivity in the manufacturing sector in Iran. A sample of 12,299 firms obtained from Iranian census plan of industrial firms in 2007 was chosen and the OLS technique was adopted to estimate the regression model. The results indicated that wage, fixed capital per employee, education of labour force, R & D activities and export orientation were significant and affected labour productivity positively. Nevertheless, training was found to be significant but negative because of the firms' inefficiencies in providing training. These results conform to the findings from a similar study by Papadogonas & Voulgaris, (2005) who found that R & D activity, export activities and capital-labour ratio were positive and significant on labour productivity.

A study of manufacturing firms in MENA countries by Samargandi, (2018) using a panel time-series data found that capital stock was positive and significant on labor productivity. This is because physical facilities reduce the amount of effort and time required to produce goods or services and thus increasing labour productivity. The study also discovered that oil, trade openness and financial development influenced labor productivity. Besides, the level of human capital and innovation activity by firms tend to increase labor productivity. However, compensation and employment size affected labour productivity negatively. These results are in line with findings from other studies, which argued that small size firms are less productive than the larger firms

because of economies of scale and that the more the compensation for workers, the more the cost of production, which will subsequently reduce the firm's productivity.

In Greece, Papadogonas & Voulgaris, (2005) did a study to analyze the factors influencing labour productivity growth in the manufacturing sector. Using the OLS technique, the findings showed a positive and significant relationship between labour productivity and factors such as capital intensity, R & D activity and export orientation. However, their study further revealed that some factors such as firm size, age of the industry and employment growth had negative effects on labour productivity growth. The study recommended availing incentives for firms to participate in innovation and investment in modern technologies would increase R & D activity, capital intensity and export which will subsequently increase the overall productivity over time. However, the study only focused on the overall industry and small manufacturing SMEs were not given due attention.

Nagler et al. (2014) made a comparison of labor productivity between rural and urban enterprises. Their aim was to investigate the determinants of labour productivity in the selected rural African enterprises (Ethiopia, Malawi, Tanzania, Uganda and Nigeria). The outcome indicated that rural enterprises were less productivity than urban enterprises. The study also found that education, excess to credit and age which is a proxy to experience increased labour productivity. Besides, enterprises located next to densely populated areas were more productive than those far away. Firms which were subjected to shocks were less productive than those that operated without and that firms owned by female workers were less productive than those owned by their male counterparts. Firms located in areas which exhibited a history of frequent conflicts were also less productive. These findings are in line with the study done by Papon et al., (2017). Nevertheless, this study was imprecise and the analysis was narrow as only a few enterprises were being targeted.

In a study on manufacturing firms in the European Union using panel data, Corvers, (1997) analyzed how human capital affects labor productivity. His findings showed a significant positive relationship between highly skilled workers which reflected the worker and diffusion effects and labour productivity. Besides, the intermediate skilled workers coefficient was positive but insignificant. The intermediate skilled labour share of employment impacts sectoral productivity growth positively and their effect was significant. This is because the diffusion effect on labour productivity minimizes the gap of technology in the sectors of various countries. Another study

was done by Aggrey et al., (2010) on the same topic using a sample of manufacturing sectors from Kenya, Uganda and Tanzania. They found that training and average education have positive effects on labor productivity for Kenya. The share of skilled workers and average education were significant and positive for Uganda. Finally, the manager's education, the share of skilled workers and training had positive and significant effects on labour productivity for enterprises in Tanzania. This implies that labor productivity can be improved by boosting human capital.

Another study by Soh & Amin, (2019) examined the relationship between corruption and labour productivity and how it varies with the size of the firm, using a firm-level enterprise survey data of manufacturing firms in 94 developing countries between the period 2009-2017. The study focused on whether a firm was engaged in a petty corruption or overall corruption. The model was analyzed using Ordinary Least Squares and robust technique was applied. The findings were mixed. With regards to the large firms, corruption was found to be negative, and significantly related to labour productivity but for small firms, it was positive and insignificant on labour productivity. Their study concluded that there was no significant relationship between corruption and overall labour productivity. According to a study by Kato & Sato, (2014) in India, corruption reduces total value added per worker and the total factor productivity of a firm. The study further revealed that small size firms were more affected than the large size firms as the larger firms have a greater ability to deal with corruption, unlike the smaller ones. In contrast, a study done by Lavallée & Roubaud, (2019) in West Africa found that experiences of corruption raised the firm's productivity especially for informal firms by evading taxes. Furthermore, their study further revealed that the degree of incidence of corruption was just the same for both informal and formal sectors. Owing to this, the effect of corruption on labor productivity is still not clear.

Papon et al. (2017) conducted a study to find out if political instability had any effects on production and productivity of textile industries in Bangladesh. The findings showed that political instability negatively affects labor productivity and growth of garment industries. More specifically, political instability hinders production and productivity, cancellation of orders, causes shifting delays, hampers supply chain, increases lead time, hinders achievement of export targets, affects life safety of workers, it reduces workers' efficiency and worse of all, it influences many customers to switch their orders to other countries. However, this study only considered two cities and the results could have been different if a wider study covering the whole country was done.

These results conformed to the findings from a study by Mark & Nwaiwu, (2015) who argued that political instability reduced the business performances of multinational companies in Nigeria. Another study was done in Tunisia by Matta et al., (2018) which examined the impact of political instability on firm growth and revealed that political instability was indeed the most damaging obstacle to the growth of Tunisian firms. However, this study only focused on the aspects of firm growth rather than labor productivity.

In Kenya, Ngugi, (2019) used firm-level data to analyze what determines labour productivity in their manufacturing firms. The author adopted the OLS technique to analyze the model. The findings revealed that capital-labour ratio was positive and significant on labor productivity. Similarly, education level of workers, foreign ownership, firm location, the size of the firms, the number of managers employed and export status, were found to be important determinants. These results echoed the findings from Aslaninia et al., (2010) and other studies done on labour productivity in the manufacturing sector.

Another study in Kenya by Heshmati & Rashidghalam,(2018) in which they analyzed both manufacturing and service firms using a data from the World Bank 2013 Enterprise Survey, found that capital intensity, wages, educational levels and training of workers were positive and their relationship was significant on labour productivity. The authors also found that a managerial experience which was expressed in a non-linear form positively and significantly affected labour productivity. This implied that a manager with adequate capabilities can accomplish quality work. However, power outages, waiting for water connections and a higher number of female workers reduce labour productivity. An extra unit increase in female labour share decreases labour productivity by 0.04% holding other factors constant. Websites and emails did not matter as far labor productivity was a concern. The findings conform to those from Ngugi, (2019) who found that an extra percentage increase in capital per labour raised labour productivity by 0.35%. Another study was done in Nigeria by Agbanike et al., (2019) which confirmed similar findings.

A study in Tanzania by Goedhuys et al., (2008), using cross-sectional firm-level data aimed at whether technological advances or business environment have effects on the productivity of the manufacturing sector. Their results showed that ISO certification, higher education of management, foreign ownership, membership and business association were important determinants of productivity. Other factors like Research and Development, training, product and

process innovation and technological licensing were found to reduce productivity. Another study by Baptist & Teal, (2014) on the effects of technology on the manufacturing firms in Africa discovered that technology accounts for the variations in output per capital at firm levels.

Harris & Robinson, (2003) used a data obtained from an Annual Business Inquiry Respondents Database to investigate the impact of foreign ownership on labour productivity growth in the United Kingdom manufacturing industry during a period 1974-1995. After employing a Generalized Method of Moments system approach for analysis, the findings revealed that foreign own firms have higher labour productivity than the domestic owned firms. This is because foreign-owned firms have marketing capabilities, ability to network with suppliers and customers, better management as well as specialist knowledge of production. This finding is consistent with that of Goedhuys et al., (2008) in Tanzania who found that foreign ownership impact productivity positively. However, there are instances from the literature where foreign-owned firms have a negative relationship on labour productivity due to high cost arising from initial constraints in putting up the new plants and some cultural differences encountered in the host countries.

2.3 Overview of the Literature

From the vast literature reviewed on labour productivity, several factors have been identified to influence labour productivity in the manufacturing firms in different countries. The most common factors that influenced labour productivity include capital intensity, educational level of the labour force, exports orientation, formal training programme, skilled workers, firm size, product and process innovation as well as ownership. Other factors include the age of the firm, the location of firms, the experience of the top managers and infrastructural variables. However, there is a paucity of studies that investigated clearly, in fragile states context other important factors such as political instability and corruption which are also expected to affect labour productivity in the manufacturing sector. In case some studies exist, they did not use the most recent data. Despite the previous studies done on the topic, their findings cannot be generalized to the context of South Sudan manufacturing sector which might have its unique determinants. Since no specific study was done on the determinants of labour productivity in South Sudan, it is yet unclear which are the actual determinants of labour productivity with respect to its manufacturing sector.

According to literature, it is observed that different approaches have been used by various studies to analyze the labour productivity in manufacturing firms and have yielded varied results

(Samargandi,2018; Konings & Vanormelingen,2015; Aggrey et al.,2010; Heshmati & Rashidghalam,2018; Aslaninia et al., 2010; Papadogonas & Voulgaris,2005). This is because some of these factors vary in terms of their relevance in determining labour productivity based on the context of firms in each country. According to a study done by Heshmati & Rashidghalam, (2018), labour productivity determinants are categorized into the main, labour, firm, infrastructure characteristics and other obstacles.

From the empirical literature, most of the previous studies focused on labour productivity at the industry levels and very few have examined the firm-level impact. However, a study on industry level turns to generalize the findings on the determinants of labour productivity which may be unrealistic to the context of firm-level (Papdogonas & Voulgaris, 2005). Therefore, understanding the basic labor productivity's determinants at firm level can be critical in knowing how the overall industry can perform better.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology used to meet the objectives of this study. Specifically, it discussed the theoretical framework, the model specification, the estimation procedures, the definition of variables and their measurements, type and source of data and the diagnostic tests.

3.1.1. Theoretical Framework

To estimate the labour productivity in the manufacturing sector in South Sudan, the study used the concept of production function framework which represents the technical relationship between output and inputs using a given technology. Output can be maximized from a given quantity of inputs. Supposing i equals the number of a given manufacturing firm which produces a net output Y, and after considering the work of Covers, (1997), then it is possible to express this production function in form of a Cobb Douglas function as:

$$\mathbf{Y_i = AK_i^{\alpha} L_i^{*\beta}} \qquad (\mathbf{2})$$

Where: **Y** is the total output of a given firm, **K** is the amount of physical capital, $\mathbf{L^*}$ represents the labour efficiency units, **A** is the state of firm technology, **α** & **β** indicate the elasticities of physical capital and labour respectively. **i** is the number of firms in the sector i.e. i =1……. N^{th} firms.

To measure the labour efficiency units, the number of employees or hours worked is multiplied by the three levels of education which are the lower, intermediate and higher education (Covers, 1997). Nevertheless, according to the data from the World Bank Enterprise Survey, 2014 for South Sudan, education had been expressed in quantitative terms but not in the form of educational levels dummies. Thus, the efficiency unit of labour is given by the average number of years of education of employees in the firm. In this case, the equation of labour efficiency units can be modified and expressed as:

$$\mathbf{L_i^* = E} \qquad (\mathbf{3})$$

Where **E** represents the average number of years of education of workers in the firm. Now, to compute labour productivity, we substitute equation (3) into equation (2) and divide both sides by the total number of workers, L.

$$\frac{\mathbf{Y_i}}{\mathbf{L}} = \mathbf{A}\left(\frac{\mathbf{K_i}}{\mathbf{L}}\right)^{\boldsymbol{\alpha}} (\mathbf{E})^{\boldsymbol{\beta}} \qquad (\mathbf{4})$$

Where: **Y/L** represents labour productivity, **K/L** captures the capital intensity, **α** and **β** represents the contributions of physical and human capital to productivity.

The above equation indicated the worker's effect which implied that more labour produced more output provided that the marginal product is positive (Welch, 1970).

3.1.2 Empirical Model Specification

In this section, the study adjusts equation 3 and then extends the Corvers, (1997) model to incorporate additional human capital variables while considering the cross-sectional data in which the labour productivity of various firms is being studied at the same point in time possibly a year. These human capital variables include the skilled workers and formal training dummy which are denoted by **S, T.**

$$\frac{\mathbf{Y_i}}{\mathbf{L_i}} = \mathbf{A}(\frac{\mathbf{Y_i}}{\mathbf{L_i}})^{\boldsymbol{\alpha}}\mathbf{E}^{\boldsymbol{\beta 1}}\mathbf{S}^{\boldsymbol{\beta 2}}\mathbf{T}^{\boldsymbol{\beta 3}} \qquad (\mathbf{5})$$

This equation presented the allocative effect which implied that highly educated workers can utilize available inputs and techniques more efficiently, thus increasing labour productivity.

The above model did not include some important variables such as political instability and corruption yet, they are believed to influence labour productivity in the manufacturing sector (Soh & Amin, 2019; Papon et al., 2017). This model is extended further by adding other crucial factors like firm size and foreign ownership which are drawn from the literature since these factors are also believed to influence labour productivity (Goedhuys et al., 2008; Ngugi, 2019). After having incorporated these variables into the model, then, the equation is transformed into a logarithmic form and simplified further by letting $\boldsymbol{\alpha_i}$ represent a common factor for the population parameters. Suppose these additional variables are denoted by **P, C, F** and **O** then the final labour productivity equation to be estimated is expressed as:

$$\ln\frac{\mathbf{Y_i}}{\mathbf{L_i}} = \boldsymbol{\alpha_0} + \boldsymbol{\alpha_1}\ln\left(\frac{\mathbf{K_i}}{\mathbf{L_i}}\right) + \boldsymbol{\alpha_2}\mathbf{E_i} + \boldsymbol{\alpha_3}\mathbf{S_i} + \boldsymbol{\alpha_4}\mathbf{T} + \boldsymbol{\alpha_5}\mathbf{P_i} + \boldsymbol{\alpha_6}\,\mathbf{C_i} + \boldsymbol{\alpha_7}\mathbf{F_i} + \boldsymbol{\alpha_8}\mathbf{O_i} \quad (\mathbf{6})$$

Where:

(Y/L) represents the labor productivity which refers to the value of output per unit of labour. It is obtained from the gross annual sales less the cost of the intermediate goods and raw materials divided by the total employees in the manufacturing sector.

(K/L) represents capital intensity which is a proxy of the total value of net fixed assets per labour in a firm. It is anticipated to affect labour productivity positively (Aslaninia et al., 2010; Ngugi, 2019).

E represents the average number of years of education of a production worker in a firm. It is expected to be positive on labor productivity. The more the years spent pursuing education, the more efficient the labour becomes and the higher the labour productivity (Covers, 1997; Aggrey et al., 2010).

S represents the number of skilled workers employed by a firm. It is argued that skilled workers are more efficient in production than non-skilled workers. It is anticipated to affect labour productivity positively. (Aggrey et al., 2010).

T is the formal training programme dummy taking 1 if a firm's employee received any formal training in the last fiscal year and 0 otherwise. It is anticipated to be positively related to labour productivity. Training imparts workers with relevant skills and knowledge which enable them to be more productive (Welch, 1970; Konings & Vanormelingen, 2015).

P refers to political instability dummy which takes the value of 1 if a firm reported political instability as a major obstacle to labour productivity and zero otherwise. It is anticipated to impact labour productivity negatively (Papon et al., 2017; Matta et al., 2018).

C represents corruption dummy. It takes the value 1 if a firm perceived corruption as a major obstacle and zero otherwise. It is expected to have a negative sign of labor productivity (Soh & Amin, 2019).

O refers to foreign ownership dummy which takes 1 if foreign individuals or companies hold at least 50% of the firm and zero otherwise. This variable is expected to have a positive effect on labor productivity in that foreign-owned firms are more equipped with skills, capital and experiences than domestic owned ones (Goedhuys et al., 2008; Harris & Robinson, 2003).

F represents the firm size which is a proxy of the total number of workers employed by each firm. It takes the value of 1 if a firm is small with less than 20 employees, zero otherwise, 1 if a medium

firm with employees between 20-99, zero otherwise and 1 if a firm is a large with more than 100 employees and zero otherwise.

3.2 Estimation Procedure

From equation 6 shown above, the left-hand side represents the dependent variable which is the log of labour productivity and the right side are the explanatory variables which are the factors that influence labour productivity. Since the model is linear in parameters, the Ordinary Least Squares (OLS) technique was adopted to estimate the determinants of labour productivity. The approach is suitable for this study than other methods because it is simple and straightforward to use and provides better estimates over other estimation techniques provided that the OLS assumptions are met according to Gauss Markov theorem (Gujarati, 2004). The log-log model was applied to deal with a large difference in the margins of measurement of some quantitative variables. The interpretation of the coefficients was done using elasticities and proportions.

3.3 Type and Source of Data

The study used the World Bank Enterprise Survey 2014 data. This data was collected by the World Bank in collaboration with the South Sudan National Bureau of Statistics. The survey was administered through a stratified sampling approach where a sample of 748 manufacturing and services firms was chosen and interviewed randomly. Of the total sample, 90 firms were for the manufacturing sector. Therefore, the current data chosen for this study was representative of all the firms in the manufacturing sector. A cross-sectional data was used for the analysis of the factors influencing labour productivity model using a sample of 90 manufacturing firms selected from four regions of South Sudan i.e., Juba, Yei, Nimule and Torit. These places were chosen because they represented areas where the majority of manufacturing enterprises were found. The survey data suited this study because it provided a wide information on the manufacturing sector in South Sudan.

3.4 Variables Definition and Measurements.

Table 3.1 Variables definition and measurements

Variables	Variables Description and Measurements
Dependent Variable	
Labour productivity (Y/L)	It is the value of output per unit of labor in the manufacturing firms. It is obtained by taking the gross annual sales minus the cost of intermediate goods and raw materials then divide by the total employees.
Independent Variables	
Capital intensity (K/L)	Refers to the total value of physical capital per unit of labour. It is measured by summing up the firm's net book value of fixed assets (i.e., machinery, equipment, vehicles, buildings and land).
Average years of Education (E)	It is a continuous variable which represents an average number of years spent in acquiring education by production workers in a firm.
Number of Skilled workers (S)	It captures the number of production workers employed by a firm who possessed a certain set of skills.
Training Program (T)	It is a dummy variable that takes the value 1 if a firm's employee received a formal training programme in the last fiscal year and 0 otherwise.
Political Instability (P)	It measures the extent to which political instability is perceived as an obstacle to labor productivity. It takes 1 if a firm perceived political instability as a major obstacle and 0 otherwise.
Corruption (C)	It measures the degree to which corruption is an obstacle to a firm performance. It takes 1 if a firm perceived corruption as a major obstacle and 0 otherwise.
Small-Sized firms (F)	It is a dummy variable that takes 1 if a firm is a small size with 5-19 employees and 0 otherwise.
Medium-Sized firms (F)	It is a dummy variable which equals 1 if a firm is a medium size with 20-99 employees and 0 otherwise.
Large-Sized firms (F)	It is a dummy variable that takes 1 if a firm is large firm with over 100 employees and 0 otherwise.
Foreign Ownership (O)	It is a dummy variable that takes 1 if foreign individuals or companies hold at least 50% of the firm and 0 otherwise.

Note: *The variables shown in the table above were measured according to the responses from the Enterprise Survey done by SSNBS and World Bank in South Sudan in 2014.*

3.5 Diagnostic Tests

3.5.1 Multicollinearity test

Multicollinearity is a situation in which there is a high linear correlation between two or more explanatory variables in a multiple regression model. The effect of this problem is that although the results are BLUE, the Ordinary Least Squares (OLS) estimators have a large variance that makes precise estimation hard thus making the results unreliable. To detect for the presence of multicollinearity among the explanatory variables in the model, there are two approaches used: the Pearson Correlation Coefficient analysis and the Variance Inflation Factor (VIF) test. If the correlation coefficient of a variable is greater than 0.7, it implies that there is a presence of high multicollinearity. As for the VIF test, when the VIF value exceeds the conventional VIF value of 10, the null hypothesis is rejected in favor of multicollinearity and the suitable solution to this problem is by dropping the particular variable (s) in question from the model (Gujarati, 2004).

3.5.2 Heteroskedasticity test

Heteroscedasticity is another econometric problem commonly associated with cross-sectional analysis whereby the variances of the residuals in a regression model are not constant. It occurs as a contravention of one of the classical linear regression model assumptions which states that the variance of the disturbance is homoscedastic or constant. When it exists, the estimated coefficients become bias and this makes it difficult to draw meaningful conclusions. To check for the presence of heteroscedasticity, we use the Breusch-Pagan approach. If the probability of chi2 is less than 5% level of significance, the null hypothesis of constant variance is rejected in favour of heteroscedasticity. To correct for the presence of heteroscedasticity, a robust standard error method is employed (Guajarati, 2004).

CHAPTER FOUR: EMPIRICAL FINDINGS AND RESULTS DISCUSSION

4.1 Introduction

This chapter presents the data analysis, discussion and interpretation of the regression results on the determinants of labor productivity in the manufacturing sector in South Sudan. It focuses mainly on the summary statistics, multicollinearity and heteroscedasticity tests as well as the OLS regression results.

4.2 Summary statistics

This sub-section described the summary statistics of the data. Specifically, it presented the type of variable, observation, mean, standard deviation, minimum and maximum values. This information is presented in table 4.1 below.

Table 4.1 Summary statistics of variables in the study

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Labor Productivity	30	38,193.75	41,320.02	500	170,454.5
Capital Intensity	30	29,319.21	49,882.02	138.89	177,272.7
Average years of education	30	10.97	5.47	0	25
Number of Skilled workers	30	8.47	8.65	2	40
Formal Training programme	30	0.23	0.43	0	1
Political Instability	30	0.33	0.48	0	1
Corruption	30	0.33	0.48	0	1
Small-Sized firms	30	0.73	0.45	0	1
Medium-Sized firms	30	0.23	0.43	0	1
Large-Sized firms	30	0.03	0.18	0	1
Foreign Ownership	30	0.6	0.5	0	1

Source: STATA computation

From Table 4.1, the manufacturing firm labor productivity was, on average 38,193.75 South Sudanese Pounds and had a standard deviation of 41,320.02. Labor productivity fell within the interval of 500 to 170,454.5 South Sudanese Pounds. The mean of capital-labour-ratio (Capital intensity) which represents the investments on fixed assets was, 29,319.21 South Sudanese Pounds. It also had the largest dispersion of 49,882.02 compared to other observations. The minimum value of capital-labour-ratio was 138.9 while the maximum value was 177,272.7 South Sudanese Pounds.

The average number of years of education for an employee in each firm was approximately 11 years. On average, the number of skilled workers per firm was 8. Of the firms studied, the proportion of employees who received a formal training programme in the last fiscal year was 23%. Approximately 33% of the firms' perceived political instability as a major obstacle. Also, the proportion of firms which perceived corruption as a major obstacle was 33%. As for the firms' size, small firms constituted 73.3 %, medium firms were 23% and large firms accounted for only 3% of the total firms. Finally, on average, 60% of the firms were owned by foreigners.

4.3 Multicollinearity test

4.3.1 Correlation Analysis

To check whether there was any correlation among the independent variables in the model, pairwise correlation analysis was used. From Table 4.2. (see below) the correlation coefficients indicated that there were generally low linear relationships among the explanatory variables in the model. This implied that multicollinearity was not a serious problem in this study. Owing to that, it was then possible to proceed with running the regression of the model.

Table 4.2 Pairwise correlation matrix

Variables	lnCapital intensity	Average years of education	Formal Training programme	Number of skilled workers	Political instability	Corruption	Firm Size	Foreign Ownership
lnCapital intensity	1.000							
Average years of education	0.233	1.000						
Formal Training programme	0.233	-0.099	1.000					
Number of skilled workers	-0.109	0.012	-0.067	1.000				
Political instability	-0.287	0.228	-0.223	-0.313	1.000			
Corruption	0.154	0.582	0.111	-0.022	0.250	1.000		
Firm Size	0.021	-0.185	-0.165	0.609	-0.269	-0.134	1.000	
Foreign Ownership	0.088	0.273	0.129	0.293	0.000	0.000	0.207	1.000

4.3.2 Variance Inflation Factor test for Multicollinearity

In this section, another important test for multicollinearity was carried out using the Variance Inflation Factor (VIF) approach to confirm if multicollinearity was a major concern or not. Multicollinearity is said to be present if the value of the VIF of each independent variable is greater than 10 (Kennedy,1992). The results of the VIF test are presented in table 4.3 below:

Table 4.3 Variance Inflation Factor

Variable	**VIF**	**1/VIF**
lnCapital intensity	1.42	0.705528
Average years of education	2.31	0.432732
Number of Skilled workers	2.07	0.484018
Formal training programme	1.39	0.721517
Political instability	1.58	0.634535
Corruption	1.88	0.530610
Medium-Sized firms	1.90	0.525455
Large-Sized firms	1.29	0.776471
Foreign Ownership	1.40	0.716241
Mean VIF	**1.69**	

Source: STATA computation

From Table 4.3, it was observed that the VIF values for the various independent variables and the mean VIF value were less than the standard VIF value of 10. These results indicated a weak correlation among the independent variables. Hence, multicollinearity was not a serious problem in this study.

4.4 Heteroscedasticity test

To ascertain the validity of the regression results, the study tested for heteroscedasticity which is a phenomenon in which the variances of the residuals are not constant across observations. When the variances of the error terms are heteroscedastic, the estimated coefficients become highly inflated which is misleading and this makes it hard to draw meaningful conclusions (Gujarati,2004). We employed Breusch & Pagan, (1979) to check for the presence of heteroscedasticity. The results are presented in Table 4.4 below.

Table 4.4 Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Calculated chi2	0.01
Prob>chi2	0.9053

H_0: Constant Variance

From Table 4.4, the probability of chi2 is greater than the conventional 5% level of significance. Therefore, we failed to reject the null hypothesis of constant variance and concluded that heteroscedasticity was not of a concern in this study.

4.5 Interpretation and Discussion of the Results

From the regression model, the R-squared value was 0.555 (see Table 4.5). This implied that the independent variables in the model explained 55.5% of the variations in the dependent variable (labour productivity). Since the overall P-value of F statistics was 0.0277 which is less than 5% level of significance, we rejected the null hypothesis that the model with no predictor variables fits the data as well as the regression model. This means that there is sufficient evidence to conclude that the regression model fits the data better than the model with no predictor variables. Therefore, the model was statistically significant.

Table 4.5 Regression estimates for the log of Labor productivity

Variables	Coefficients
lnCapital intensity	0.322**
	(0.142)
Average years of education	0.127**
	(0.0552)
Number of skilled workers	0.00901
	(0.0330)
Formal Training programme	0.254
	(0.544)
Political instability	-0.262
	(0.520)
Corruption	-0.650
	(0.569)
Medium-Sized firms	1.426**
	(0.637)
Large-Sized firms	-0.975
	(1.235)
Foreign Ownership	-1.074**
	(0.471)
Constant	6.080***
	(1.341)
Prob>F	0.0277
Observations	30
R-squared	0.555

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable in the above equation is log Labor productivity.

Holding other factors constant, a 1% increase in capital-labour-ratio increased labour productivity by 0.322%. The variable was positive and statistically significant at 5% level of significance. Economic theory argues that physical capital increases labour productivity in that it provides labour with the necessary tools which enable them to produce more with less efforts and time. This result is in line with the findings from Aslaninia, (2010) and Ngugi, (2019) who found that an increase in capital per labour tends to raise labour productivity of a given firm.

Average years of education was positive on labour productivity. Ceteris paribus, an employee with an additional year of education raised a firm's labour productivity by 13.54%. The variable was significant at 5% level of significance. This conforms to the human capital theory which asserts that education imparts workers with relevant knowledge and skills that enable them to become more productive. This theory also assumes that education raises the marginal productivity of labour. For South Sudan, the country has witnessed a tremendous increase in the number of basic, intermediate and tertiary enrolment rates since it gained her independence in 2011 owing to high expectations of a possible increase in the benefits associated with more education. This implied that the education of workers in the manufacturing sector as measured by average years of education is an important determinant of labour productivity in South Sudan. This finding is consistent with those of Aggrey et al., (2010) and Covers, (1997) who found that education raised labour productivity.

The coefficient of the number of skilled workers was found to have a positive effect on labour productivity as anticipated. However, the impact of the variable on labour productivity was insignificant. Formal training programme was also positive but had an insignificant impact on labour productivity. Firms which reported political instability as a major obstacle experienced lower labour productivity as compared to firms that did not perceive it as a major obstacle but the impact was insignificant. Firms which reported corruption as a major obstacle also experienced less labour productivity than firms that did not report it as a major obstacle. However, the impact was not statistically significant.

Holding other factors constant, labour productivity was significantly higher for medium-sized firms as compared to small-sized firms. The variable was significant at 5% level of significance. Medium firms tend to have lower average production costs as well as the advantage of the economies of scale than the small firms which are still associated with higher costs of production, since they have just joined the industry. This result is consistent with the finding from (Ngugi, 2019). Large-sized firms registered lower labour productivity than small-sized firms. This contradicts the view that large firms are expected to be more productive than small firms because large firms tend to possess more capital, enjoy the economies of scale and better management. However, there are instances where further growth of large firms could lead to diseconomies of scale which may reduce labour productivity as per the literature.

Foreign ownership coefficient showed a negative relationship with labour productivity. Ceteris paribus, a firm owned by a foreigner experienced less labour productivity than a firm which was owned by a local. The impact of this variable on labour productivity was significant at 5% level of significance. This contradicts the view that foreign-owned firms are more productive than the domestic owned firms because the latter are better equipped with more capital, skills, better management, marketing capabilities, specialized knowledge about production, export contracts, and new technologies (Goedhuys et al., 2008; Harris & Robinson, 2003). Nevertheless, there are instances from the literature where foreign-owned firms may experience a decline in labour productivity due to initial constraints in assimilating new plants as well as some cultural differences faced in the host country (Papadogonas & Voulgaris,2005).

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction

This chapter summarizes the findings of the study on the determinants of labour productivity in South Sudan's manufacturing sector and makes some conclusions. It also draws some policy implications based on the findings and points out potential areas for further research.

5.2 Summary of the study's findings

Labour productivity is an important measure of profitability, competitiveness and growth of a firm. More importantly, it enhances the economic growth of developing countries. With the increasing globalized competition on manufacturing products, the firm's survival depends mainly on its productivity especially labour productivity. Since most of the developing countries are still characterized by low labour productivity in the recent years, deeper understanding of the major determinants of labour productivity has become an important policy concern especially in South Sudan which is grappling with the challenge to improve the productivity of its sectors to catch up with the rest of the developing countries in terms of economic growth.

The main aim of this study was to investigate the determinants of labour productivity in South Sudan manufacturing sector using the data obtained from 2014 World Bank Enterprise survey. A linear multiple regression model was analyzed using Ordinary Least Squares technique. The dependent variable was labor productivity which was regressed against independent variables namely capital intensity, average years of education, number of skilled workers, formal training programme, political instability, corruption, medium-sized firm, large-sized firm and foreign ownership.

The main findings of this study showed that capital intensity, average years of education and medium-sized firms had a positive and significant effect on labour productivity in South Sudan manufacturing firms. Foreign ownership was unexpectedly found to have a negative but significant impact on labour productivity. The number of skilled workers and a formal training programme had insignificant effect on labour productivity. Other factors with insignificant effects included political instability, corruption and large-sized firms.

5.3 Conclusions of the study

The main objective of this study was to investigate the determinants of labour productivity in South Sudan manufacturing sector. From the findings, the study deduced that capital intensity, average years of education and medium-sized firms were positive and significantly impacted labour productivity in the manufacturing sector in South Sudan. Besides, foreign ownership was significant but had a negative effect on labor productivity which was unexpected. Therefore, adopting policies aimed at increasing physical capital, promoting education, expansion of firm size and boosting the productivity of foreign ownership would greatly improve labor productivity in South Sudan manufacturing sector.

5.4 Policy Implications

This study makes the following recommendations to improve labour productivity in the manufacturing sector in South Sudan.

There is a need for firms to quickly hire educated workers because they have capacities to improve labour productivity. Besides, the government should establish more fully equipped educational institutions such as primary schools, secondary schools, colleges, universities and other learning institutions across the country to encourage more young people to join these learning institutions. This is because more education provides workers with the necessary skills and knowledge which enable them to become more innovative and eventually raise labour productivity.

Firms should also channel more resources into increasing investment in physical capital. This is because more physical capital provides workers with necessary tools which makes them more productive. The government should also allocate adequate resources for investment in the country's assets given their crucial role in augmenting labour productivity.

Since medium firms are more productive than the small firms, the government should create a favorable environment for the growth and expansion of medium firms by giving them support in terms of more credit to boost their capital needs and reduces their production costs.

Foreign-owned firms experienced a decline in labour productivity perhaps due to high cost of production. To mitigate this, the government should create a conducive environment that lowers the production costs of firms. Besides, government should support the domestic firms financially

and through capacity building in order to enhance their expansion since they have higher labor productivity than their foreign counterparts.

5.5 Areas for further study

This study investigated the main determinants of labour productivity in South Sudan manufacturing sector using 2014 World Bank Enterprise survey data. Due to the effect of time difference which can affect the determinants, a more recent data can also be used to analyze the determinants of labour productivity growth between the two time periods in the same sector in the country.

Also, a new study that compares labour productivity in the manufacturing sector with other major sectors of the economy namely service and agriculture sectors need to be explored. This will help in understanding the sector which is more productive to channel sufficient resources into it. Furthermore, it will be important for future researchers to conduct a fresh study that investigates how labour productivity varies between Small and Medium Enterprise (SMEs) and large firms using a new data set.

Finally, the key independent variables were capital intensity, average years of education, the proportion of skilled workers, political instability, corruption, firm size and foreign ownership. However, variables such as export status, wages, managerial experience and education, excess to finance, infrastructural and other important variables that were not captured by this model due to data limitations, should be included into the new model by future studies.

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