# Human Capital Development, Labour Productivity and Inclusive Growth in Sub-Saharan African (SSA) Countries

**David Tunji EYIOLORUNSHE**
**LCU/PG/001252**

**Being a PhD Post-field Presentation to the Department of Economics, Faculty of Management & Social Sciences, Lead City University, Ibadan, Oyo State, Nigeria**

**In Partial Fulfilment of the Requirements for the Award of Doctor of Philosophy Degree (PhD) in Economics**

**2024**

**Abstract**

In the past decades, scholars directed their focus towards unraveling the macroeconomic effects of human capital development and labour productivity. Despite human capital development being recognized as a growth stimulant, studies on sub-Saharan Africa's labour productivity, human capital development, and inclusive growth nexus remain scarce and contradictory owing to low labor productivity and the inappropriateness of GDP growth as a measure of inclusive growth. This study examines the relationship among human capital input and output factors, labour productivity, and inclusive growth in 32 SSA countries from 1999 to 2021. The study employs panel annual secondary data from World Development indicators (2023), International Labour Organization (2022), United Nation Population Division, Department of Economic and Social Affairs (2023). A panel system generalized method of moments (GMM) was utilized as a suitable estimation approach technique. The study found that public health and education expenditure positively impact labor productivity, while government health spending negatively affects inclusive growth. The study reveals that inadequate public health spending correlates with low output growth, high unemployment, and rising inequality in the region. Additionally, the output factors of human capital development such as primary and secondary school enrollment and infant mortality have adverse effects on inclusive growth. Labor productivity also negatively impacts inclusive growth, primarily due to income inequality. The corresponding marginal effects of the interaction between labour productivity and human capital input and output factors are approximately negative on income growth, equality and employment. This means that human capital development do not play a supportive role in ameliorating the negative effect of low labour productivity on inclusive growth. The study concludes that human capital development does not sufficiently counteract the negative effects of low labor productivity on inclusive growth. It suggests the need to increase government investment in education and healthcare, alongside labor market reforms, to address inequality, promote growth, and enhance employment in SSA.

**Keywords:** Human capital input and output, output per worker, equality, income growth, employment, inclusive growth index.

**Word Count:** 288.

# Chapter One

# Introduction

## 1.1 Background to the Study

Human capital development is recognized as a crucial factor in enhancing productivity and playing a significant role in the economic development of any nation. The variations in socioeconomic development among nations can be attributed to the quality and quantity of human capital[2]. Human capital development encompasses the skills, education, capacity, and attributes of the workforce that influence their productivity and earning potential. It goes beyond measuring intellectual capacity and focuses on improving individuals' productivity[3]. Higher education, technical or on-the-job training, and health are among the qualities that contribute to productivity[4]. Investments in quality education, healthcare, job creation, and skills development enhance the abilities of the labor force, leading to greater economic output and higher individual incomes[3, 5].

While the effective utilization of human capital can increase efficiency and productivity in the short term, sustained productivity growth requires investment in human capital through various resources in the education and health sectors[3]. Increased investment in human capital raises the long-term level of labor productivity, which, in turn, affects the rate of productivity growth[6]. Labor productivity, measured as the output obtained from the workforce per hour worked, is a key indicator of economic performance and growth[6]. However, there are several factors that influence labor productivity such as the stock of capital goods, physical and institutional infrastructures, health, skills of workers (human capital), and technological advancement[7]. These driving forces of labor productivity are crucial for formulating labor market policies to support a nation's economic growth[8].

Thus, any economic growth strategy should prioritize the mobilization of resources towards improving labor productivity. Higher labor productivity is associated with investments in human capital, including specific education/training policies and accessible healthcare facilities. Labor productivity provides insights into the efficiency and quality of human capital in the production process[9]. It is a vital prerequisite for long-term inclusive and sustainable growth[3]. The relationship between growth and equity has gained renewed attention, emphasizing the need to consider equity and distribution alongside economic growth[10]. To achieve inclusive growth, economic opportunities must be created and accessible to all members of society, allowing them to participate in and benefit from growth[11, 12]. For any growth to be inclusive, it has to focus on productive employment, productivity improvement, and the creation of new job opportunities[3].

Besides, it is only a productive labour force that can contribute and benefit from the development process of the economy[3]. Inclusive growth entails ensuring everyone participates in growth process both in terms of decision making for organizing the growth progression as well in participating in the growth itself[3]. To a large extent, economic growth in recent times is seen as a necessary and not sufficient condition for a country's ability to improve the welfare of its population because growth pattern that not accompanied by improvement in human capital development lead ultimately to non-inclusive growth process[3,10]. A narrow focus on growth and a failure to consider its wider ramifications can have far-reaching consequences[10]. This has in turn put the importance of growth in perspective by considering the type and pattern of growth are of inclusive and sustainable as well.

Nevertheless, inclusive growth creates economic opportunities that are available to all, and its sustainability relies on high labor productivity combined with equal opportunities across economic, social, and institutional dimensions[10, 11]. Also, inclusive growth provides gainful

employment for individuals that are made possible through education and skill development[3]. The impact of human capital on growth is manifested through increased labor efficiency and productivity, producing a skilled workforce capable of driving sustainable economic growth[7]. Consequently, the provision of education and healthcare infrastructure is a key driver for achieving inclusive growth, reducing unemployment, inequality, and increasing labor productivity, thereby contributing to economic inclusion[3].

The provision of education and healthcare infrastructure affects inclusive growth by creating higher employment opportunities, reducing income inequality, and promoting wealth distribution. It not only contributes to skills development but also through labor market activation and intermediation that integrate vulnerable groups, thereby driving inclusive growth[7]. According to the African Development Bank, investing in education and healthcare infrastructure can lead to output growth and job creation[13]. Improvements in human capital development also enable the creation of better jobs with higher wages and improved working conditions, contributing to inclusive growth, human well-being, social equity, and shared economic opportunities[3].

Empirical evidence suggests that education impacts labor market outcomes, including wages and earnings, employment/unemployment rates, worker productivity/GDP per worker, hours worked nature of work, worker's health, and fringe benefits[7]. These elements are essential for achieving inclusive growth as they emphasize equality in access to essential social services and contribute to human capital development[3]. Also safety nets, social protection, and the provision of public and social goods are also important components of inclusive growth. All these elements enhance labor productivity, and therefore, improving education and health levels should be prioritized in conjunction with efforts to directly enhance economic growth[9].

The fundamental link between human capital and inclusive growth lies in the active participation of skilled individuals in the labor market[1]. While education and training are crucial, it is equally important for these skilled individuals to actively engage in productive sectors of the economy[1]. Understanding how labor productivity translates into inclusive growth is vital. It should be noted that productive employment is the major driver of inclusive growth in any economy, and for growth to be truly inclusive, it must prioritize employment. Therefore, long-term sustainability of growth depends on equity and inclusivity.

### 1.2 Statement of the Problem

In Sub Sahara Africa (SSA), Statistics has shown that the region records the worst economic performance globally, with an average reduction from about 4.75 percent in 2010 to 2.4 percent in 2018 resulting in poor performance and hindered growth[7, 13]. As the Sub Sahara African economy struggles to recover from the 2020 recession induced by the Covid-19, the region now faces new economic growth challenges, compounded by the Russian invasion of Ukraine[14]. The region estimates growth at 3.6 percent in 2022, down from 4 percent in 2021 as the region continues to deal with global inflation, supply disruptions and climate shocks[14]. With rising unemployment and low labor productivity, Sub-Saharan African (SSA) countries are struggling to improve their labor market performance, leading to increased poverty levels and income inequality[7, 15]. Insufficient budget allocations to the education and health sectors further contribute to low productivity levels and limited access to quality healthcare services. Government expenditure on education and health remains meager compared to other regions, resulting in inadequate facilities, underpaid health workers, and a lack of progress in human capital development. These challenges hinder domestic production, exacerbate poverty and inequality, and impede inclusive economic growth

Evidence in Sub Saharan African (SSA) suggests that insufficient budget allocations to the education and health sectors further contribute to low productivity levels and limited access to quality healthcare services. As regards the budgetary allocation to the education sector, SSA spends 3.4% of its gross domestic product on education in 2020, compared with OECD countries and North America at 5.3% and 5.6% respectively[16]. However, health care delivery in Sub-Saharan Africa has been dismal over the years[17]. Health expenditure as a percentage of gross domestic products (GDP) in SSA was recorded at 5.09 percent in 2018, which is far below 12.46% of the Organization for Economic Cooperation and Development (OECD) countries[7].

Government expenditure on health is meagre for Sub Saharan African countries, leading to inadequate health facilities, poor remuneration of health workers amongst other factors accounting for the poor state of health in these countries[7]. Despite improvements in GDP growth of 4.7% in 2021 which has been largely attributed to the increase in international commodity prices for most resource-rich countries in SSA, poor education and training, and lack of access to quality healthcare services remains a key challenge confronting the region. For some SSA countries, there are evidences of severe health conditions that could affect labour productivity such as heart conditions, diabetes, asthma and other respiratory related diseases[7]. Literature has also established that most SSA countries are inefficient in converting health expenditure into improved health status compared to other developing regions[7].

Furthermore, government expenditure on education as a percentage of total government expenditure has been inconsistent in SSA countries from 16.7% in 2015 to 17.0% in 2018 and then 14.3% in 2021[16]. However, this has not translated to improved human capital, despite the importance of human capital; there is still a high human capital gap which hampers growth inclusiveness in the SSA region. A report from World Economic Forum stated that SSA has a

47% human capital gap and was ranked first with the highest level of human capital deficit compared with Western Europe, North America, and South Asia in 2017[18].

Given this low level of human capital accumulation, the region continues to be faced with low domestic production, high levels of extreme poverty and inequality. SSA countries lack behind other regions in human capital development with the gap widening over time[3]. Unemployment rate is among the highest in the world[19]. According to the international labour organization (ILO) report in 2022, one in five African youth were not in employment, education, or training in 2021[20]. In SSA, 83% of the youth that enter the labour market every year remain jobless and the devastating impact of Covid-19 pushed an additional 30million people into extreme poverty and made many others more vulnerable[20].

In view of growth, levels of economic growth witnessed in some SSA countries in recent times has not been inclusive as the absolute number of poor and hungry people in Sub Saharan Africa has increased considerably. The economies of Sub-Saharan Africa have been a jobless one in which youth are grossly affected[3]. The regions' economies have not been sufficiently transformed and continue to be commodity-based with weak value addition, poor manufacturing and industrialization[21]. Thus, the economies remain dependent on the capital- intensive extractive sectors, limiting their capacity to create enough jobs to absorb the rapidly growth labor force[16]. The growth rate in labor productivity in Sub Saharan Africa is relatively low compared with Latin American who has raised productivity growth to close the large gap in living standards in relation to advanced economies, and thereby escaping the middle-income trap[22]. On average, Latin Americans spend more time in work activities than the Sub Saharan Africa, but this accompanied by high contribution of labour resource utilization to GDP per capita[22].

However, Sub Saharan Africa (SSA) is said to have failed despite its vast human and natural resources, the region accounts for thirds of global extreme poor population[23]. Income inequality in the region (as measured by the Gini coefficient) remains high[16]. For many countries in SSA, Income inequality is rooted in their economic structure in which a few high-income sectors generate significant wealth, but only a small number of people, leaving the vast majority of the workforce trapped in lower-income sectors in which they earn far less in the lower-income sectors[24]. This inequality is often exacerbated by inadequate education and training which should have spurred productive labour force consequently stimulates growth. In this regards, it follows that the SSA region is unlikely to compete globally in innovation, technology and productivity unless education policies are reviewed to enhance the effects of human capital on productivity[15]. The trend of rising inequality deserve close attention, African leaders need to step up efforts aiming to promote equal economic opportunities such as raising labour productivity in the informal sector, increasing yield in the agricultural sector, promoting value chains, improving social safety nets, and boosting human capital. However, enhancing productivity for inclusive growth ensures SSA reach their full potential and is on path to prosperity[19].

### 1.3 Aim and Objectives of the Study

This study is premised on the following objectives:

i. Examine the effect of human capital development on labour productivity in SSA countries.

ii. Investigate the effect of human capital development on inclusive growth in SSA countries.

iii. Analyze how labour productivity enhances inclusive growth in SSA countries.

iv. Analyze the joint effect of human capital development and labour productivity on inclusive growth in SSA countries.

## 1.4 Research Questions

The following research questions are generated to guide this study:

1. To what extent does human capital development affect labor productivity in SSA countries?
2. To what degree can we ascertain the impact of human capital development on inclusive growth in SSA countries?
3. To what extent does labor productivity contribute to enhancing inclusive growth in SSA countries?
4. To what extent does human capital development combined with labor productivity impact inclusive growth in SSA countries?

## 1.5 Hypotheses

The study is guided by the following hypotheses.

$H_0$1: Human capital development has no significant effect on labour productivity in SSA countries

$H_0$2: Human capital development has no significant effect on inclusive growth in SSA countries

$H_0$3: Labour productivity has no significant effect on inclusive growth in SSA countries.

$H_0$4: Human capital development and labour productivity have no joint effect on inclusive growth in SSA countries.

## 1.6 Significance of the Study

The analysis of the relationship between human capital and labor productivity has been extensively discussed over the past two decades. However, the literature appears to lack a comprehensive analysis of how labor productivity translates into inclusive economic growth. Such analysis is particularly important in the current context, where enhancing human capabilities through education, leading to increased labor productivity, is recognized as a key driver of inclusive growth.

This study thoroughly reviews the topic and provides a deeper understanding on the relationship among human capital development, labour productivity and inclusive growth in Sub Saharan African (SSA) Countries. It contributes to the literature as it expands the subject matter and provides insights on the antecedents of human capital development. The finding of the study therefore shed light on the importance of investing in education, healthcare, and skill development to enhance labor productivity and achieve inclusive and sustainable economic growth. By understanding the mechanisms through which human capital influences inclusive growth, policymakers can formulate effective strategies to promote economic opportunities, reduce inequality, and improve the well-being of the population.

The study provides both practical and theoretical benefits to a wide range of interest groups including individuals, business owners and administrators, government, economic planners and

policy makers, and researchers. The findings of this study enlight individual members of the public on how human capital development influence labour productivity and how policy choices on monetary policy, fiscal policy and structural policies affect both productivity and inequality. If coordinated and enacted coherently, they could act as levers to tackle the productivity slowdown and the rise in inequality together.

The findings of this study are no small measure serves as guides for government, educational planners, and policy makers on how to formulate and implement useful and reliable economic and fiscal policies that could best exploit human resources availability. Finally, the findings of this study are useful to present and future researchers in this field and related disciplines as they serve as a database or reference point for other researchers.



### 1.7 Scope of the Study

This study examines the empirical relationship among human capital development, labor productivity, and inclusive growth in Sub-Saharan African (SSA) countries. Africa is a continent facing the dual challenges of promoting productivity and achieving inclusive growth. The slowdown in productivity of labor and the rise in income inequality highlight the need for policy changes to improve prospects for citizens and the overall continental economy. The study employed a panel data set covering twenty-three years (1999-2021) to examine the nature of growth in Sub-Saharan Africa. The selected timeframe (1999-2021) was chosen because the period aligns with the transition from the Millennium Development Goals (MDGs) in 2015 to Sustainable Development Goals (SDGs). Thus, make it a crucial period in international development efforts. The SDGs served as a global framework for addressing global challenges and promoting equitable economic opportunities, social inclusion and sustainable development.

By addressing inequalities and ensuring that no one is left behind, inclusive growth plays a crucial role in achieving the overarching objectives of the SDGs.

The panel data encompasses information about 32 Sub-Saharan African countries, including Congo Democratic Republic, Gabon, Guinea Bissau, Angola, Burundi, Republic of the Congo, Guinea, Equatorial Guinea, Cote D'Ivoire, Ghana, Niger, Nigeria, Kenya, Sierra Leone, Cameroon, Burkina Faso, Togo, Senegal, Benin, Ethiopia, Gambia, Uganda, Rwanda, Mozambique, South Africa Republic, Botswana, Cape Verde, Mali, Madagascar, Mauritania, Namibia, and Zimbabwe. The rationale behind selecting these countries is due to low physical investment and total factor productivity in these countries over time. These have reflected inefficiencies in resource allocation; poor delivery of public goods, notably health care and education; and the high risk of doing business in many parts of the SSA countries. Moreover, though the labour force has expanded rapidly, its productivity has remained relatively low because of generally poor standards of health and education. This trend enables a thorough examination of how low physical investment impacts human capital development, labour productivity, and the prospects for achieving inclusive growth. These data were sourced majorly from World Bank indicators, International Labour Organization (ILOSTAT), United Nation Population Division, Department of Economic and Social Affairs.

## 1.8 Limitation of the Study

The research work may be constrained due to non- availability of data of some the variables of interest and difficulty in data compilation and cleaning. Time also may pose constrain as the study will be conducted alongside academic work.

## 1.9 Operation Definition of Terms

**Human Capital:** This is considered to be a combination of the knowledge, skills, abilities, as well as valuable experience that individuals or groups of people possess in proportion to the value of a country's organization.

**Labour:** It can be defined both in terms of its quality and quantity. It is quantity depends on the size of the population and its willingness and ability to work. While quality of labour refers to its skill, knowledge and the health of the workers.

**Labour Productivity**: This is defined as output per worker or per hour worked. Factors that can affect labour productivity include workers' skills, technological change, management practices and changes in other inputs (such as capital).

**Inclusive Growth:** This is economic growth that is distributed fairly across society and creates opportunities for all. It is a provision of social opportunities such as access to health and education.

## Endnotes


1. O.A Campbell & S.I Ojo. *Human Capital and Poverty in Nigeria"*Working Paper in Progress, 2021, 79-95.

2. T. Nwambuko. *Human Resources Management and Capacity Building: A Pragmatic Approach to Sustaining Microfinance Institutions in Nigeria.* Conference on Microfinance and Enterprise Development Selected Conference Papers, Benin City, Edo State, Nigeria. 2019, 31-35.

3. A. Campbell. *Investment in Human Capital for Inclusive Growth: Limitata or Illimitata Accessum to Sustainable Development.* Lead City Univsersity, Ibadan, 12th Inaugural Lecture, 2021

4. A. Ezoji., A. Arani,., M. Vaez Mahdavi & E. Jahangard. *The Impact of Human Capital (Health and Education) on Labor Productivity; a Composite Model Approach- A Case Study of Iran*. Iranian Economic Review, 23(2), 2019, 373-397. doi: 10.22059/ier.2019.70287

5. GradesFixer. *Human Resource Development*. 2021, https://gradesfixer.com/free-essay-examples/human-resource-development/

6. R.A Mohamed., A.I Abd El-aziz., H.N Ramadan., M.H Abd El-sayed & H.A Emam. *Impact of Human Capital on Economic Growth in Egypt*: *An ARDL Approach*. European Journal of Economic and Finance Admin. Sci.108, 2021

7. A. Campbell & E. Aderinto. *Human Capital Development and Labour Market Outcomes in Africa: Evidence from Sub-Saharan African Countries*. Journal of Economics and Sustainable Development, 13(6), 2020.

8. O. A Campbell. *"Rostow's Growth Theory, Structural Transformation and Economic Development in Nigeria"* in International Journal of Arts and Social Sciences, Cumberland, Rhode Island, USA, 12(1), 2019.

9. F. Mamoloko., C. Rangongo, & C. Ngwakwe. *Human Capital Investment and Economic Growth: A Test of Endogenous Growth Theory in Two Developing Coun*tries. ACTA Universitatis Danubius, 15(1), 2019.

10. A. Obeng., P. Mwinlaaru & I. Ofori. *Global Value Chain Participation and Inclusive Growth in Sub-Saharan Africa*. European Xtramile Centre of African Studies (EXCAS), 2021.

11. E. Okowa., & M. Vincent. *Human Capital Development and Labour Productivity in Nigeria.* Australian Research Journal of Humanities, Management and Social Sciences 11(1), (2019), 142-155.

12. N. Ngepah., C.S Saba & N.G Mabindisa. *Human Capital and Economic Growth in South Africa: A Cross-Municipality Panel Data Analysis*. South Africa Journal of Economic. And Management Sci. 24 (1), 2021, 1–11.

13. African Development Bank (AFDB). *Africa's Economic Growth to Outpace Global Forecast in 2023-2024* – African Development Bank Biannual Report, 2023.

14. World Bank: *Sub Saharan African Growth Slows Amid Ongoing and New Economic Shocks*. Press Release, April 13, 2022.

15. G. Akinola & J. Mbonigaba. *Human Capital in the Sub Saharan African Countries: Productivity and the Policy Implications* AUDOE, 15(1), 2019, 163-189

16. World Bank Database. *Government Expenditure on Education, total (% of GDP), 2023*.

17. Q. Wang, Y. Hua, R. Tao, & N. Moldovan "*Can Health Human Capital Help the Sub-Saharan"Africa Out of the Poverty Trap?* An ARDL Model Approach. Frontiers in Public Health, 9, 642, 2021.

18. A. Mutiu, Oyinlola, A, Abdulfatai A. Adedeji, & O. Onitekun "*Human Capital, Innovation, and Inclusive Growth in Sub-Saharan African Region*, Economic Analysis and Policy" 72, 609-625, 2021.

19. African Development Bank *"African Economic Outlook 2020"*Developing Africa's Workforce for the Future, 2020.

20. African Development Bank *"Human Capital Development"* (2022) https://www.afdb.org/fr/topics-and-sectors/human-capital-development

21. Economic Commission for Africa. *"Africa Regional Forum on Sustainable Development"* Fifth session Marrakech, Morocco, 16–18, 2019.

22. F. Olarewaju., S Areo., A. Ogundipe., Y. Ogunbiyi, & A. Asaleye. *Capital and Labour Productivity: A Comparative Study of Nigeria and South Africa*. Asian Economic and Financial Review, 10(12), 2020, 1384-1395.

23. World Bank Blogs: *Where the Extreme Poor Live*. 2020 https// bogs.worldbank.org/opendata/where-the-extreme-poor-live

24. D. Gandhi. "*Africa in Focus: Figures of the Week: Diverging Trends on Income Inequality in Sub Saharan Africa"* Brookings, September 28, 2019.

# Chapter Two
# Literature Review

This chapter looks at the conceptual and theoretical literature, including the empirical and theoretical framework of the study. The survey of literature consists of the nexus between the variables of study to see whether their relationship holds and to know the nature of the relationship from the literature context including how one influences the other. It further looks at various theories and based on their approach; determine which is best to ensure that human capital development plays an important role in driving labour productivity.

## 2.1 Conceptual Review

### 2.1.1 Human Capital Development

The origins of human capital go back to the 18th century (more specifically, to Adam Smith), although its current importance is due to the elaboration of proper theories since the Second World War[1]. Accordingly, way back in 1964, Nobel Prize winners and University of Chicago economists Gary Becker and Theodore Schultz expounded the theory of human capital[2]. Becker realized that investment in workers is no different from investing in capital equipment, which is another factor of production[2]. Both are assets that yield income and other outputs. Human capital is Becker's classic study of how investment in an individual's education and training is similar to business investments in equipment[3]. His 1964 book entitled "Human Capital" was a seminal study that put the concept on the map, and Becker is now considered one of the most influential economists of his time for this very research[4]. The book is dedicated to investing in a person's knowledge and skills and the relationship between human capital and economic growth. Becker's approach justifies investment in education and training of workers. He identified knowledge, production skills, and motivation in the human capital of an individual[5].

The Becker view lies in human capital being directly useful in the production process[2]. Human capital is one form of capital in analogy to other forms such as physical or natural capital. Schultz explains the term by emphasizing that it can be considered a form of capital because it is the source of future earnings, or of future satisfactions, or of both of them. It is human because it is an integral part of man[1].

According to Becker, education could be added to "human capital" in the same way as other investments in physical capital. His work opened the door for economics to explore the relationship between human behavior and economic growth, as well as the role of the human brain[6]. Becker stated that economics' main purpose was to understand and alleviate poverty, and his award-winning research focuses on microeconomics in the relationship between human capital, human behavior, and economic growth[4]. Indeed, human capital increases a worker's productivity while at the same time increasing productivity in other areas of life, such as health, education, and employment[7].

It is hardly an exaggeration to say that the approach of human capital is one of the most empirically applied theories in economics, and also helps to explain economy patterns between countries. Indeed, differences in the supply of human capital in a country have been shown to have a significant impact on the quality of life and productivity of its citizens. The practical application of this theory to human capital has dramatically facilitated productivity gains and increased availability of goods and services in countries like the United States and China[6]. Furthermore, human capital refers to the knowledge, skills and experience that workers have in the economy[8]. Human capital influences economic growth and can contribute to the development

of an economy by increasing the knowledge and skills of its people[9]. In most developed countries, economies were fostered by increasing their capacity to train productive and skilled workers[10].

Moreover, human capital is considered to be a combination of the knowledge, skills, abilities, as well as valuable experience that individuals or groups of people possess in proportion to the value of a country's organization[11, 12]. Human capital was often applied as a key indicator of economic and social development all around the world[13]. Throughout the whole human history, several major shifts and upheavals occurred that fundamentally transformed social and economic relations and contributed to the shaping up of the human capital. These changes impacted on the innovation of the development of knowledge and the formation of the world order[1, 14].

With regard to the above, one can recall the endogenous growth model, in which human capital acts as a growth engine, has been widely used in the literature to analyze the effects of economic policy[15]. The endogenous growth theory holds that investment in human capital, innovation, and knowledge makes a substantial contribution to economic growth[16, 17, 18]. Clearly, human capital plays a key role in the development of any nation. In fact, the differences in the level of socio-economic development across nations are attributed not so much to natural resource endowment and the stock of physical capital but to the quality and quantity of human capital[19].

Generally, human capital is developed in several ways such as formal education, in–service or on the job" training, individual or self-development. Human capital can also be developed through improvement in the health of the working population by means of better medical and public health programmes and improvement in nutrition, which jointly increase the working capacity of people on a man-hour basis as well as over a working life. However, investment in the education

and skilling of workers is one of the critical functions that drive the improvement in productivity of labour. Human capital influences the country's economic growth, labour productivity and increases national competitiveness. Some scholars who adopted the human capital framework, education, skill and human capital are interchangeable concepts. In particular, in the vast majority of human capital studies "--education is the most important component of human capital"[20]. There are many authors who point to the fact that formal education is only one way to create skills[21], for instance questions on the adequacy of years of education as a measure of workplace skills.

However, most jobs acquire a multitude of different skills for adequate task performance, ranging from physical abilities to cognitive skills and interpersonal skills[22]. Moreover, they consider that in some occupations, educational attainment may not be a direct measure of job related to skills per se but a devise used to screen for the ability to learn on the job and for desirable social and personal characteristics[22].

### 2.1.2 Labour Productivity

In economics, productivity refers to how much output can be produced with a given set of inputs (that is the ratio of output to input). Productivity increases when more output is produced with the same amount of inputs or when the same amount of output is produced with less inputs[23]. The labor productivity, which is the most common indicator for measuring the productivity, is the output corresponding to input obtained from the workforce or is defined as added value per each hour worked[24]. Labour productivity is a measure of labour output. The productivity is measured in hourly terms. In macro-economic terms, labour productivity measures the real Gross

Domestic Product (GDP) produced in an hour through labour. Labour productivity is an essential factor in the overall growth[25].

However, labour can be defined both in terms of its quality and quantity. Its quantity depends on the size of the population and its willingness and ability to work. Thus, the growth in population and its dynamics has a consequence on the composition of the labour force, and consequently, on labour productivity[26]. The quality of labour refers to its skill, knowledge and the health of the workers. This requires investment through education and various other socio-economic functions of the state. All of these factors determine the extent of the productivity of labour, or human capital[27]. Labor productivity is a measure of economic performance that compares the amount of output with the amount of labor used to produce that output[28]. Labour productivity is defined as output per worker or per hour worked. Factors that can affect labour productivity include workers' skills, technological change, management practices and changes in other inputs (such as capital) [23].

Business Development Bank of Canada (BDC) see labour productivity as the value adds in goods, services or both and is calculated by the hours or employees required to produce that value[29]. It's key to determining economic growth. At the macro-economic level, economists use the term "labour productivity" to refer to the amount of real gross domestic product (GDP) produced by an hour of labour in a given country. For businesses (and at the micro-economic level), labour productivity is a performance indicator that measures how much value your workers create per hour worked. This latter definition is more relevant to entrepreneurs[29].

Labour productivity is associated with the acceleration or slowing down of the rate of growth, at times without discerning the extent of the relationship between the two. Labour productivity

refers to the labour units used to produce a given output. A country with higher labour productivity tends to experience higher rates of growth and is assumed to be competitive in the global market. Similarly, in the local economy, firms that produce more goods and services using less factor inputs, in this case labour (either in relation to its cost or its quantity), tend to be more competitive in terms of prices as compared to firms whose productive factors cost higher[30].

Labour productivity can also be defined as GDP per hour worked, which can be decomposed into the contributions of capital deepening (i.e. higher capital per unit of labour) and a residual, total factor productivity[31]. There are three determinants of labor productivity. First one is human capital. Human capital comes from accumulated knowledge (education and experience), talent and expertise of an average employee in the economic process. The second factor is technological change. New inventions and innovations inspire the development of new products and services, which, in turn, increase the productivity. The third one is economies of scale that reduce manufacturing costs[32, 33].

Specifically, labour productivity charts the amount of real gross domestic product (GDP) produced by an hour of labour. It is the relationship between output of goods and services and the input of resources-human and non-human resources used in the production process[34]. Output in this context can be in form of goods or services while the inputs vary from capital, energy, materials, time and labour. However, labour Productivity can be computed for a firm, industrial group, the entire industrial sector or the economy as a whole. It measures the level of efficiency at which scarce resources are being utilized. Higher or increasing labour productivity will, therefore, mean either getting more output with the same level of input or the same level of output with less input. With an increase in labour productivity, more goods and services are

produced for an increased demand for consumer goods and services. Labour productivity grows with a positive interaction between investment in human capital, new technologies, and physical capital[25].

However, labour productivity can be measured as a ratio of GDP over one hour of employed labour, or real GDP per worker. In other word, labour input can be measured as either the number of employed persons or the number of paid hours worked by employees. Hours worked measures are typically preferred because they capture changes in standard working hours, leave, overtime and flexible work arrangements. The ABS also reports hours worked that have been adjusted for 'quality', meaning that they take into account changes in the level of education and experience of the labour force[23]. Several yardsticks often used to measure labour productivity. Thus, labour statistics are presented in terms of the wage bill paid together with the number of workers and the hours worked, it become easier to measure labour inputs compared to, for instance, capita. For instance, the wage rate by dividing the wage bill with the number of worker of hours worked. "The number of person-hours is generally a better measure of true labor input than number of workers, since the latter does not reflect changes in the hours worked per worker"[35].

In some countries, due to pressures in terms of availability of statistical data, the use of output per worker is prevalent. However, measuring labour productivity based on the total workforce employed poses challenges such as double counting as some workers have more than one job, whilst others would work overtime or be absent from work. This will distort the estimate[36].
Quarterly Labour Force Survey (QLFS, conducted an interesting exercise of measuring labour productivity using the figures of total employment on the one hand, and of total hours worked on

the other in the South African labour market[37]. This exercise yielded the same results, leading to conclusion that labour productivity has risen by more than 30% since 2000. Different countries using the same model, this may not be the case in all instances. In both instances these studies play an important role in understanding labour productivity, particularly for policy makers who have to take these results into consideration[37].

In the case of South Africa, the South African Reserve Bank (SARB) is responsible for the calculation of labour productivity using GDP data from the national accounts and employment figures from Statistics South Africa's Quarterly Employment Survey (QES) [37]. The weakness with using QES is that it provides data from formal employment in the non-agricultural sector only, and is only collected from employers[31]. This is in contrast to the frequently used (for policy decisions and other labour market related decisions) and relied on Quarterly Labor Force Survey (QLFS) that tracks a larger sample of the population over time and is used for determination of various labour market policy interventions.

A further problem lies with the weight of the input compared to the output, since National Accounts includes all the economic activity of the country when calculating GDP. This distorts the outcomes if we are to use a sample (QES or QLFS) to calculate labour productivity[37]. Although the same methods have been used in Australia, Canada and Mexico, it may be helpful to set up a labour unit in the National Accounts at Statistics so that the input is equal in sample to the output[38]. As indicated before, the generally used measurement is that of total hours worked. Although, the measurement of the main factors driving productivity growth is derived from the standard Cobb-Douglas production function which relates to labour input, capital input and technological progress, that is, the residual which cannot be explained by the quantity and quality

of either labour or capital[30]. This method take into consideration the fact that capital and labour factors may be influenced by external factors that will change the output, therefore including technological progress gives us a total picture of productivity using the Solow residual, that is, the productivity component that cannot be explained by changes in the quality or quantity of capital or labour[39].

If labour is used as a single measure of efficiency (taking other factors as constant) would be incomplete because firms can, for instance, boost output per man-hour by investing more in equipping workers with better or more machinery and thus affect its productivity[37]. Thus, 'one of the drawbacks of labour productivity is that it compares output against only one input. Labour productivity may therefore be raised (or decline) by simply raising the quantity (or quality) of another input (e.g. capital)[40]. This implies that labour productivity may be reliant on the subjective or objective factors that may or may not be in their control[40].

Unlike labour and capital intensive productivity, which are partial measures or single input measures of productivity, TFP is a measure of the effect of improvements in the quality of all inputs and in what manner they are used[41]. The multifactor productivity helps to disentangle the direct growth contributions of labour, capital, intermediate inputs and technology, thus a superior measure than either labour or capital productivity[37].

Total Factor Productivity (TFP) is the portion of output not explained by the amount of inputs used in production[37]. The level of TFP is determined by how efficiently and intensely the inputs are utilised in production, and is usually measured by the Solow Residual. TFP plays a critical role on economic fluctuations, economic growth and cross-country per capita difference[37]. For example, in the production of cars, if there is no mention of an increase in labour or capital units,

but there is a significant rise (in tenfold) of productivity, there has to be an explanation of the value of the contribution of technological progress (owing to innovation and Research and Development). This is where TFP comes into place, and has been used widely in the place of the traditional calculations of two-input over the output[37].

There are factors that drive the increase or decline of the productivity of labour such as:

1. **Education and Skills of Workers (Human Capital)**

The education system has impacted positively on the entrepreneurial urge of the population as its intention is to provide minimal training that simply creates a reproduction of their labour. The main challenge that education system faces especially in developing countries is the quality of education, and its ability to produce sufficient graduates for the labour market. It is important to stress that education alone is not going to drive productivity, but the presence of institutions that support workers welfare, proper bankruptcy laws, access to capital and various other factors that supports the initiation and sustenance of the productive process.

In addition, Africa has experienced the loss of skills in recent times has been detrimental in creating unskilled and semi-skilled work as it has been showed that for every professional employment created, there are three more jobs created as a result[37]. The economy has over the years still remains labour intensive sectors such as mining, manufacturing and agriculture as the core of economic activity.

The various democratic reforms at a political level did not rapidly move towards the transformation of the workplace in SSA countries, and therefore some of the disparities in wages, rank and general conditions of employment are slow and continues to replicate itself across the labour market[30]. Poor working conditions and very little prospect of improving skills affects

labour productivity, as workers continue to engage in rolling industrial unrests demanding higher wages and better working conditions[37].

Investment in the education and skilling of workers is one of the critical functions that drive the improvement in productivity of labour. Through this, workers can be accustomed to new forms of organization and easily respond to new technology.

2. **Technological Progress**

The introduction of new technology is one of the biggest factors in improving labour productivity, and has played a significant role in maintaining economic growth in developed economies. However, the recent decline in demand for unskilled and semi-skilled labour as a result of the changing global environment and a higher demand for technology as a substitute for labour[37]. Using the Solow residual model, or total factor productivity, it has been shown that the relative contribution of technological growth in any economy will increase over time and become an important source of output growth.

3. **Rules and Regulations**

One of the consistent criticisms of the most developing countries, labour market has been the 'rigidity' of labour regulations and embeds in legislation and the constitution of a given economy. The debate regarding labour inflexibility is an extremely contentious matter and has become extremely polarized. According to [37] argue that to undo South Africa apartheid legacy it was important to develop a suite of new labour legislation, which was to be the cornerstone of a new labour regulatory regime. Others, such as [37], argue that due to the political nature of the trade union movement and its alliance with the ruling party that it uses this influence to further introduce labour inflexibilities. From an economic argument, the higher costs of labour inputs

and the constraints associated with replacing unproductive labour, business will opt for capital intensive production in order to increase output. However, a study suggested that no matter the costs associated with labour, it would be illogical for business to replace labour with machines if it does not make profitability, and that the substitution of labour for capitals lies in what is profitable (and practical since some labour processes cannot be simply replaced).

Drawing extensively from the Global Competitiveness Report of the World Economic Forum in 2012/2013, looks at the labour market sub-index and conclude that Africa has performed poorly[39]. The Global Competitive Index looked at four measures, that is (i) cooperation in labour-employer relations; (ii) flexibility in wage determination; (iii) pay and productivity and; (iv) hiring and firing practices.

With a focus on the demand side, labour market, labour market segmentation, participation costs, skills mismatches and a possible high reservation wages attributed to labour market rigidities. The rapid growth of real wages which outpaced labour productivity in most sectors also contributed in the slow recovery of employment and growth.

### 2.1.3 Concept of Inclusive Growth

Inclusive growth has gained increasing prominence in recent years. The concept originated in the work of economists debating the importance of not just growth itself but of the shape and distribution of growth across a population[42]. While inclusive growth means many different things to different people, it can be broadly defined as 'a concern with both the pace *and* pattern of growth[43]. Where previous approaches to economic development had prioritised any growth, inclusive growth asks new questions about which people and places stand to benefit from growth as well as which people or places are excluded from the benefits of growth[42].

The absence of a universally agreed notion of inclusive growth has led to a wide range of measurement indicators which vary from 'unclear' to 'straightforward' to 'technically difficult'[24]. A variety of approaches have emerged with emphases on different aspects of the concept. Narrower concepts stress outcomes (e.g., growth plus equity) and are easier to measure and monitor. Wider concepts are multi-dimensional and hence more ambitious in scope: they stress improved opportunities for achieving better outcomes; they differentiate between processes and outcomes and they widen outcomes to include non-income aspects (social goods and safety nets) [44.] An implicit risk is that an overambitious notion of inclusive growth becomes both meaningless and impractical if it comes close to advocating 'everything for everyone [44].

However, there is not as yet a universally agreed notion of 'inclusive growth'. While growth is easier to define and measure, specifying, what makes it 'inclusive' is much more contentious[45]. There is broad agreement that inclusive growth is growth for 'the benefit of most', but ambiguities and disagreements abound beyond this general idea[46]. Taking a somewhat narrow approach, for instance, inclusive growth can be characterised as 'growth plus declining income disparities' In this formulation, inclusive growth stretches the Pro-Poor-Growth (PPG) approach by adopting a wider notion of who constitutes the poor. This definition, it must be noted, excludes non-income considerations and, therefore, lends itself much more easily to measurement[47]. At another opposite extreme, inclusive growth is also sometimes loosely referred to as 'growth that benefits everyone[47]. In this perhaps its broadest sense the concept seems to imply that growth should 'benefit all stripes of society, including the poor, the near-poor, the middle income groups, and even the rich[47]. This is equally problematic and highlights the fact

that it is not just who is to benefit from growth but the extent and distribution of such benefits are important considerations and should not be overlooked[48].

The distinction with inclusive growth is that 'social' interventions and 'economic' interventions are seen as one and the same. Rather than relying on 'post-growth' redistributive measures to correct for inequalities produced by a particular economic model, inclusive growth looks to make those economic systems stronger and more inclusive by design: delivering an economy that more people have a meaningful stake in, and prosperity that is more broadly shared[42]. Rather than treating the economy as separate to society, inclusive growth recognises that they are indivisible: the economy shapes society and society shapes the economy[42]. Inclusive growth is only about redistributing resources but also about 'raising the pace of growth and enlarging the size of the economywhile the economy of wellbeing specifically highlights the need for putting people at the centre of policy and moving away from an attitude of 'grow first, redistribute and clean up later' towards a growth model that is equitable and sustainable from the outset"[49]. In doing so, an inclusive growth model positions the wellbeing of people and planet as a core concern of economic development, rather than an afterthought.

Inclusive growth is economic growth that is distributed fairly across society and creates opportunities for all[50]. Some scholars refer to the provision of social opportunities (such as access to health and education) and how these may vary with income levels[51]. Similarly, the World Bank's Commission on Growth and Development talks of inclusiveness as encompassing 'equity, equality of opportunity, and protection in market and employment. In addition, IG entails achieving sustainable growth that will create and expand economic opportunities and ensure broader access to these opportunities so that members of the society can participate in and

benefit from economic growth[52]. The pursuit of IG agenda entails firstly, boosting and modernizing agriculture, which provides livelihood for majority of the populace. Secondly, improving the investment and business climate, and providing support for indigenous micro and small businesses. Thirdly, providing and facilitating access to better quality and relevant education and training. Finally, IG involves broadening participation in the development process. The outcome of IG is faster and it enhances sustainable economic growth. Thus for growth to be inclusive, it has to be pro-employment. IG takes a long term perspective and focuses on productive employment rather than income distribution. It is only a productive labour force that can contribute and benefit from the development process of the economy. Furthermore, for economic growth to be inclusive, it has to be pro-poor.This implies that the average man is expected to live above the poverty line which is only possible if economic activity in the economy keep increasing and not otherwise[53].

Economic growth that is inclusive has three outcomes—poverty and income inequality reduction, increased economic participation[54].Poverty and inequality have already been established as pro-poor growth outcomes, but the inclusion of economic participation makes growth more inclusive[54]. Moreover, economic growth may not necessarily explain increase in inclusiveness as some countries showed high inclusiveness with lower growth rates and vice versa. Nonetheless, World Bank is unambiguous that economic growth provides the foundation for shared prosperity, which requires continuous growth of economies whilst ensuring that the welfare of the bottom 40% of the population is improved[53]. Thus, inclusive growth is related to broad-based growth across all sectors of an economy accompanied by non-discriminatory participation in the growth process.

According to IPPR Scotland, working definition of inclusive growth should be based on four key components[55].

1. Recognising that a fairer economy is a stronger economy:Inclusive growth approaches recognise that high levels of inequality weaken economicperformance and that by addressing inequality through the process of growth itself, itcan deliver stronger economies that more people have a stake in. To realise inclusivegrowth, there is need not just growth, or greater inclusion, but growth that is designed togenerate greater economic and social inclusion not one or the other, and not sequentially[42].
2. It must narrow inequalities througheconomic growth:Inclusive growth is about narrowing inequalities through the process of economic growth. While there are lots of policy interventions that narrow inequalities through other means, they do not all constitute inclusive growth. Inclusive growth interventions must be focused on narrowing inequalities through economic means[42].
3. Inclusive growth must benefit people on lower incomes, and with less of a share in wealth:Inclusive growth must be designed to redress economic inequalities. In doing so, it must aimto benefit people on lower incomes, and people and places with less of a share in wealth.Place-based approaches are likely to be an important means to this end but not end inthemselves. Achieving growth for a rural area or for a deprived area is not necessarilyinclusive growth, in that it depends on who benefits from this growth within given area.Likewise, inclusive growth will not be realized without an embedded understanding of thestructural inequalities faced by particular groups of people. Inclusive growth's successtherefore relies on reducing inequalities of income and wealth across the given country. Given therealities of inequality, and the forces that drive them, this will

also rely on anapproach that understands different groups of people's distinct experiences and theparticular systems that perpetuate the inequality faced by different groups. This includes,for example, the gender pay gap, the ethnicity pay gap and the disability employment gap, and distinct forms of inequality produced where inequalities intersect[42].

4. Inclusive growth must be sustainable, embedded and within planetary boundaries:Inclusive growth must be sustainable to support transformational change. It must protectthe environment and nature, and lead to entrenched change over the long term.

Other scholars have argued that the human capabilities that are needed for gainful employment in order to take advantage of available economic opportunities must be considered in inclusive growth agenda. It involves increasing access to basic healthcare, education and other social infrastructure that may impact the quality of human capital. Further, growth must foster equity among various groups in society. People from all genders, sexual orientation, religion and ethnic background should be able to contribute to and benefit from economic growth[56].

### 2.1.4 The link between Human Capital and Labour Productivity

The importance of human capital for labour productivity growth has been discussed very intensively during the last two decades. Researchers emphasize that productivity growth can be achieved by improving labour skills and knowledge together with physical and mental health[57].The impact of human capital development in country productivity level is theoretically justified. Human resource development tends to improve the quality and productivity of labour, which in turn, leads to economic growth. Besides, human resource development acting as an

important vehicle of achieving equitable income distribution, it is also a potent means of addressing the problem of poverty.

The distinction between human capital and labour productivity lies in the education. Broad access to quality education and training is essential for increasing social cohesion and boosting aggregate labour productivity[31]. Thus, education is a major platform for developing human capital by equipping individuals with requisite skills and knowledge that will help increase their efficiency and worth. Human capital theorists have established that basic literacy enhances the productivity of workers in low skill occupation[53]. They further state that an instruction that demands logical or analytical reasoning or provides technical and specialized knowledge; increase the marginal productivity of workers in high skill or professional positions[53]. Thus, "the greater the provision of schooling, the greater the stock of human capital in society, consequently, the greater the increase in national productivity" However, human capital investment requires investments on along basis. It is an established fact that a shift in the investment priority to social development (ie education sector) would entail enduring positive impact on productivity[52].

Moreover, there are other factors that influence labour productivity. These includes the morale (influenced by their wages, working conditions and attitudes), technological progress, substitution of capital to labour or labour to capital ratio, and how flexible it is to higher or dismiss workers[53]. Thus, combination of all these factors can influence labor productivity. For instance, if workers are not satisfied with their wages, through their unions they can go on strike or choose to produce at lower rates in order to get management to meet their demands.

It is therefore important to understand the driving forces behind labour productivity such as the improvement of human capital in the form of health, education and skills, the role of technology and capital accumulation that informs policies that supports economic growth. These policies may include regulations in industries, institutional innovations, government investments programmes in infrastructure and human capital, regulation of the labour market, technology or a combination of all of these[56]. It is important to stress that education alone is not going to drive productivity, but the presence of institutions that support workers welfare, proper bankruptcy laws, access to capital and various other factors that supports the initiation and sustenance of the productive process[58]. Investment in the education and skilling of workers is one of the critical functions that drive the improvement in productivity of labour. Through this, workers can be accustomed to new forms of organization and easily respond to new technology.

Buttressing the relevance of human capital development to labour productivity, human capital is treated as the complex of two main elements: education and health, which are developed through investment in education and in the form of additional training and investment in health care[58]. It should be noted that in all analysed researches, human capital is related to formal education and training in work (time based learning, education level, or investment in education). Meanwhile, health as an element of human capital is ignored. Therefore, it can be stated that the impact of investment in health improvement on productivity can occur directly because a healthier person is working more productively, and also through life expectancy changes, increased population learning abilities and creativity, reduced income inequality, which makes it possible to accumulate more human capital resources due to higher investment in education and through active increase in the share of labour force in the population[53, 59]. However, both education and health are form of public and social goods that are meant to develop human capital while

enhancing productivity and are also crucial for achieving inclusive growth. Therefore, the development of the two important elements of human capital enhances overall wellbeing. Thus, the channels through which human capital development could enhance productivity were investigated. A plethora of studies exist on human capital development and productivity. In Organization for Economic Cooperation and Development (OECD) countries, the effect of human capital on productivity among some OECD countries using average years of schooling as a proxy for human capital was investigated. The study found that human capital had a large and positive coefficient value. The coefficient for Spain was higher that other OECD countries under investigated. The productivity share of human capital for Spain accounted for a 40% productivity gap and 30% for the other OECD countries[60].

A comprehensive research investigates the effect of health (proxy for human capital) on labor productivity market outcomes. A self-reported measure of general health obtained from a survey was used to estimate the effect of health on male wages using a simultaneous equation model. The results show that good health positively affects wages and is an important contribution to an employee's productivity while poor health leads to absenteeism or reduce productivity of affected workers[61]. A similar analysis was conducted using Ordinary Least Square (OLS) technique. The findings showed a bidirectional causality existing between health and per capita income (proxy for labour productivity). Conversely, a uni-directional causality was reported from education to per capita income[62]. Thus, the importance of investment in human capital via its integrals cannot be over-emphasized.

### 2.1.5 Human Capital Investment and Productivity

To assess the contribution of rising levels of education to productivity growth, there is need to distinguish between 'level effects' and 'growth effects'[63]. The former refer to a relationship

between the steady-state level of productivity and the rate of accumulation of human capital. The latter refer to a relationship between the stock of human capital and the long-run rate of growth of productivity.

The neo-classical posited that human capital is a productive input subject to diminishing returns. This implies that higher investment will raise the long-run level of labour productivity but will affect the rate of productivity growth only during the transition to the new steady-state. In the long-run, diminishing returns bring the economy back to a steady-state where growth is determined by exogenous technical progress[63].

Proponents of the 'new' growth theory are prominent examples have advocated the view that investment in embodied human capital (through child-rearing, education and training) and investment in disembodied knowledge (through R&D) differs fundamentally from investment in machinery and equipment, and is not necessarily subject to diminishing returns[63].

Policies that affect the stock of human capital have the potential to affect the longrun rate of growth of productivity: growth is endogenous. The essential argument of the new growth theory is that knowledge is non-rivalrous and that its accumulation exhibits positive feedback[63]. For example, the idea of an arch can be used simultaneously in the construction of one bridge or a hundred bridges at no extra cost; and the idea of the arch can inspire further developments in the technology of construction. As the stock of non-rivalrous knowledge grows, so researchers have an ever-broader field on which to make new discoveries[63].

### 2.1.6 The Labour Productivity- Inclusive Growth Nexus

Productive employment has become central point to the concept of inclusive growth, as it focuses not only on outcomes for poor people, but also on ensuring their participation in the

growth process through employment. As such, inclusive growth is related to the notion of broad-based growth across various sectors of an economy but also requires non-discriminatory participation by large segments of the population for its *inclusiveness* to be realized[33]. Growth is inclusive if it supports high levels of employment and rising productivity then higher wages.

Inclusive growth as a concept is beneficial because, it promotes high and sustainable growth to create productive employment opportunities for the masses, it promote social welfare and accelerates the realization of human abilities and potentials, improvement of well-being, strengthening economies, prompts sharp reduction in poverty, promotes socioeconomic stability and peace , and create accessibility to everyone[53]. Raising labour productivity growth is a key to closing the large gap in living standards. Invariably, a decline in labour productivity growth plays out against a backdrop of rising, or persistently high, inequalities of income, wealth and well-being. Low investment and high unemployment exacerbate productivity slowdown and the rise in inequalities poses greater obstacles to better economic performance[31]. In such a context, other resources will no longer automatically lead to better economic performance and stronger productivity growth. At the same time, there is no guarantee that the benefits of higher levels of growth, or higher levels of productivity in certain sectors, when they materialize, will be broadly shared across the population as a whole[31]. On the contrary, there is a risk of a vicious cycle setting in, with individuals with fewer skills and poorer access to opportunities often confined to operate in low productivity and precarious jobs. This reduces aggregate productivity, widens inequality, and ultimately undermines policy efforts to increase productivity and growth[31`].

Growth is generally considered inclusive if its benefits are widely shared across all the segments of the population that is, if it simultaneously reduces extreme poverty and inequality[31]. Growth

will reduce poverty if the mean income or consumption of the poor rises and if the welfare of the poor grows faster than that of the rest of the country[60]. However, a better use of existing skills among the population will help to increase efficiency and productivity in the near term which in return increases income, but a higher rate of productivity growth will prove difficult to sustain in the longer run without a massive improvement in educational attainments to raise skills levels[31]. Inequalities in access to quality education and opportunities to develop skills result in a massive waste of potential talent and contribute to a very high degree of income inequality[64]. This problem is reinforced by a low degree of income redistribution, which further entrenches inequalities.

Another factor contributing to poor productivity performance is the misallocation of resources the trapping of labour and capital resources in low-productivity firms and sectors as well as the slow process of reallocation towards more dynamic ones [65]. This prevents the most innovative and productive firms from reaching the necessary scale to operate in global markets and fulfilling the high growth potential that comes with the commercialization of successful ideas[31]. Symptoms of widespread resource misallocation in a country may include the large size of the informal economy and the challenge firms face to recruit staff with the necessary skills as well as striking gender inequalities[66]. Improving the efficiency of resource allocation will require lowering the barriers to market entry, firm growth and job creation in the formal economy[65].

Boosting formal employment will also contribute to higher job quality, as formal jobs tend to be characterized by higher pay, lower job insecurity and better working conditions than jobs in the informal economy[67]. Increasing job quality is therefore an important objective, not only to increase workers' well-being but also to enhance their productivity. The potential for inclusive

productivity gains associated with policy reforms in critical sector (informal sector) where the poor earn living especially in the areas of innovation, compliance with standards, skills and resources, or information gaps[68]. Therefore, productivity can also be enhanced by strong connections to external knowledge and technologies via trade, foreign direct investment (FDI), and participation in regional and global value chains as well as the international mobility of skilled labour [68].

Literature has shown that huge investment in education and health has a great potential improving labour productivity which in turn translates to inclusive growth. A few identified studies have employed different indicators in their measure of labour productivity and inclusive growth. A study examined wages from different demographic groups and employed grouped data to estimate the returns to different levels of education as factor that enhance productivity. The findings showed that education positively influence labour force participation and productivity. Results suggest that higher level of educational attainment exert significantly positive influence on wages. This implies that employees with higher education qualification earn wages between 30 to 45percent higher than employees with lower qualification[68].

The work of some researchers also made substantial submission of the positive relationship between labour productivity and growth. They used a model in which productivity was a function of demographic trends. In their analysis, productivity and investment in human capital particularly investment in education has an elastic impact on the growth of the economy[53]. This means that a percentage increase in productivity causes a more than proportionate increase in the growth. These elastic impacts of human capital and productivity on growth are transmitted through changes in increased school enrolment and labour force participation. This implies that

improvements in school enrolment and labor force participation surely increase growth through its positive impact on productivity[53].

### 2.1.7 Human Capital, Labour Productivity and Inclusive Growth

One of the crucial drivers of growth that have received more consensuses among the researchers and policymakers is human capital. Studies show that human capital explains the disparities in growth and its inclusiveness between developed and developing countries[69]. Thus, skills and knowledge accumulation equip the workforce to contribute significantly to the growth process. Moreover, human capital influences growth and inclusiveness in two ways: First, human capital accumulation is viewed as an exogenous factor that facilitates productivity at the given level of technical progress. Second, human capital amplifies growth through innovation and technical progress. Hence high human capital accumulation result or facilitate productivity and growth[69].

Human capital is a people centered strategy of development. It is basically that investment in human capital enhances the productivity and creative capabilities beings equality which can be harnessed to achieve higher and more sustainable levels of human welfare and welling[3]. Thus, the quality of knowledge acquired and its availability put to work enhance productivity[3]. This implies that knowledge acquired can also improve skills, while the greater confidence and know-how inculcated can generate more productive employment with positive effects on overall development.

For any economy, the transition to an inclusive growth will depend on the specific of the human capital and on its relative level of development. While sustaining a positive transition to inclusive growth will involve the need for people to be empowered via education and training, thus equipping them with the necessary skill and knowledge they need, thereby increasing productivity.

Little empirical evidence on the relationship between human capital, labour productivity and inclusive growth has been provided. According to a study, with a good level of education, human resources can improve their quality of life through a process of education, training, and development that guarantees increased labor productivity, which guarantees sufficient income and well-being to increase the achievement of inclusive growth[70]. This is in line with the studies of some researchers that increasing education will increase labor productivity and promote inclusive economic growth[71]. Based on this premises, hypotheses-regarding education and inclusive growth are as follows: Education has a positive impact on-inclusive growth[89]. Similarly study on how human development can translate to inclusive growth was investigated. The study focuses mainly on enhancement of human capabilities which is one of the key drivers of inclusive growth. The study shows that human capital is essential to inclusive growth through the driver of productivity[48].

In another study conducted, to examine the impact of education and human capital (quantity and quality of education) on inclusive growth using the ARDL modeling approach with annual time series data. The study concluded that education quantity (primary and secondary school enrolment) has a positive impact on inclusive growth in both short run and over long run, Index of Human Capital per Person, has a positive significant effect over the long run. The inability to address educational issues may hinder the achievement of inclusive growth[71].

In a related study where the role of human capital and innovation on inclusive growth was investigated, the study explored the direct impact of human capital and innovation measures on inclusive growth. The findings from the baseline model show that all variable of human capital exert a positive impact on inclusive growth but only school enrolment is not significant[69, 72].

### 2.1.8 Stylized fact for Human Capital Development and Output Growth Performance in Africa

#### 2.1.8.1 Human Capital and Inclusive Growth in Africa

Africa has one of the dynamic economies in the world. Unfortunately, the performance achieve has not led to improvement in living standard of the citizens. The Sub Sahara African economy struggles to recover from the 2020 recession induced by the Covid-19. The region continues to deal with global inflation, supply disruptions and climate shocks[71]. These shocks have reduced the continent's real GDP growth from 4.8 percent in 2021 to 3.8 percent in 2022. However, African economies remain resilient with a stable outlook at 4.1 percent 2023–2024[7]. Despite the tightening global financial conditions, the African Development Bank has projected in a new report.

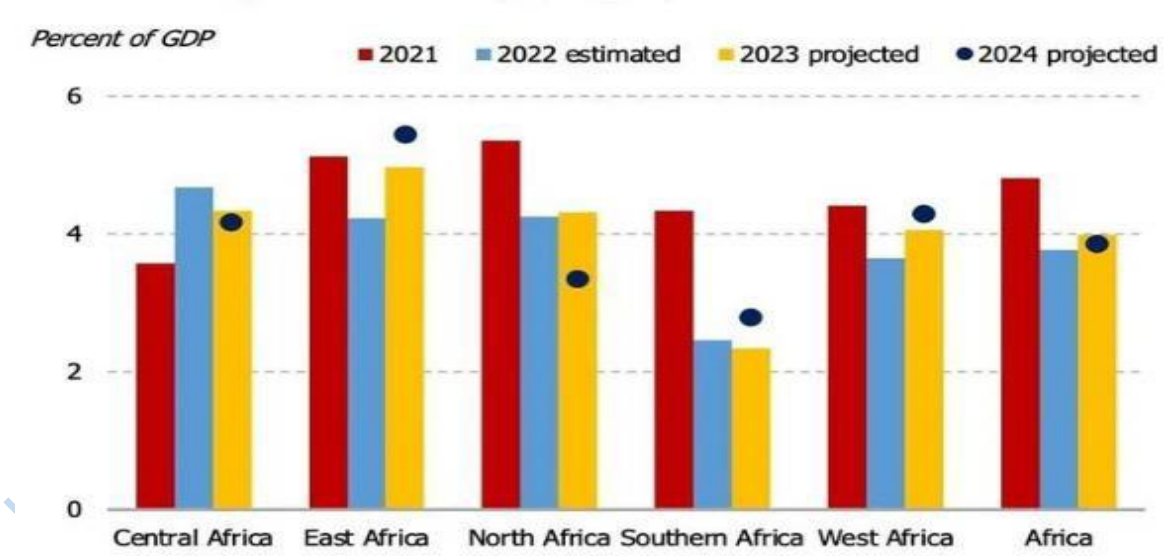



Figure 2.1: GDP Growth in Africa by Region, 2021-2024

Source[68]

The growth remains uneven across the region, while the East Africa is set to record a growth rate of 1.8% in 2023. West Africa is expected to grow at 3.3% in 2024. Overall, SSA's economic performance is hindered by below-average performance of the largest countries on the continent. But what really matters for the populations is not only the level of growth (quantity of growth) but also its quality: has Africa's growth performance been equitable and inclusive? Only about a third of African countries have achieved inclusive growth[7]. Countries with better education outcomes and higher rates of structural change are more likely to achieve inclusive growth.

However, ending extreme poverty by 2030 remains a challenge in most African countries. Countries with active inequality-reducing policies have better prospects of reducing extreme poverty more by 2030[11]. Although, human capital appears, at first sight, to have been less of a driver of growth in measured productivity than physical capital over the last 20 years in Africa. Countries with greater increases in physical capital formation over the last 20 years reached substantially higher growth rates of GDP per worker and GDP per capita over the same period[11]. But in growth terms, human capital accumulation from 2002 to 2022 was much less strongly correlated with growth in GDP per worker than physical capital. However, physical and human capital thus appear to be complementary drivers of improvements in worker productivity in recent decades, consistent with reflections on development accounting. This relationship holds within Africa, as demonstrated in the long-run growth specification from 2002 to 2022[7,11]. The recent economic outlook on Africa shown that growth in physical capital per worker and human capital appear to have been negatively correlated [32].

This could result from limited government spending on education and infrastructure[23]. Because the capital stock did not rise sufficiently to increase the marginal product of higher-skilled labor,

capital–skill complementarity may have dampened the growth in productivity per worker, despite substantial improvements in the average years of schooling[11].

Although many countries have experienced strong growth episodes, relatively few have posted significant declines in extreme poverty and inequality, which remain higher than in other world regions[71]. On average, the consumption of Africa's poor has been growing slower than the average population. In fact, while the average per capita consumption on the continent has been growing at 3.32 percent a year over the last few years, the pro-poor growth rate reached only 3.04 percent[72]. So, although poor populations have benefited from the continent's unprecedented economic growth in recent years, their consumption growth has not been fast enough to help them catch up with the average or richer segments of the populations[65]. Rich households have seen their living standards increase much faster than those of poor populations: consumption of the poorest 20 percent grew only 2.9 percent a year, compared with 3.5 percent for the richest 20 percent[71]. In addition, since inequality remains high in Africa and has leveled off since the 2000s, the growth of most African countries can be described only as inequality (or distribution) neutral[71].

To better understand the longer-term drivers of growth performance and to explain the differences across African countries, a growth and development accounting decomposition focuses on the relative roles of physical capital, human capital, labor force mobilization, and total factor productivity[73]. It explains the levels and dynamics of GDP per capita and GDP per worker over the last four decades[74]. This accounting exercise helps to identify the sources of the differences in the economic performance of African economies and the determinants of long-run growth[66]. The role of human capital in driving productivity growth is stronger in countries that have had faster growth in physical capital per worker, highlighting a potential capital–skill

complementarity[72]. So, governments need to associate investments in schooling with better matching of educated workers to productive equipment and infrastructure.

The Development accounting measured output per worker increased rapidly in North Africa after 2000, but its rise was more limited in the rest of the continent, especially in Southern, Central, and West Africa[71]. GDP per capita, by contrast, improved more uniformly across regions after 2000, as an increased employment-to-population ratio offset slower productivity growth in West and Southern Africa[65]. Heterogeneity in productivity growth per worker was partly muted by a stronger mobilization of the labor force in lower productivity-growth regions. Egypt, Mauritius, Algeria, and Gabon have the highest total factor productivity (TFP), while Zimbabwe, Liberia, and the Central African Republic are closer to the bottom of the scale in efficiency[71].

Over the past three decades, physical capital growth has been the primary driver of GDP growth across 50 African economies[71]. Employment growth contributed somewhat, as did the rise in years of schooling. And TFP mostly had a negative contribution (based on estimated elasticities in the aggregate production function)[71]. Physical capital growth, in particular, has been a major driver of improvements in GDP and GDP per worker after the turn of the millennium, as rising global capital inflows and domestic investment rates played a central role in Africa's global economic integration. [65]The positive, though limited, impact of human capital, by contrast, presents a key policy question for African policymakers: Capital and labor are complementary in Africa's long-term growth. Human capital appears, at first sight, to have been less of a driver of growth in measured productivity than physical capital over the last 20 years in Africa[65]. Countries with greater increases in physical capital formation over the last 20 years reached substantially higher growth rates of GDP per worker and GDP per capita over the same period[65].

But the complementarity between physical and human capital appears to have played a strong role in explaining patterns of growth[58]. The association between human capital growth and GDP per worker increase much more robust in the 20 countries that had above-median growth in their physical capital stock than in those with below-median physical capital stock growth[72]. Physical and human capital thus appears to be complementary drivers of improvements in worker productivity in recent decades[58], consistent with Hulten's reflections on development accounting[55]. This relationship holds within Africa which plots the long-run growth specification.

The macroeconomic returns to increased years of schooling, in terms of measured productivity per worker, appear to be significantly higher in countries where the stock of physical capital also increased at the same time[71].

Over the recent period, growth in physical capital per worker and human capital appear to have been negatively correlated[58]. This could result from limited government spending on education and infrastructure. Because the capital stock did not rise sufficiently to increase the marginal product of higher-skilled labor, capital–skill complementarity may have dampened the growth in productivity per worker, despite substantial improvements in the average years of schooling[71].

**2.1.8.2 Education, Productivity and Inclusive Growth in Sub-Saharan Africa**

There is no broad agreement on the basic policies for fostering human capital (especially education), labour productivity and inclusive growth. High productivity has been consistently found to play a key role[74]. Productivity increases measures the value added per unit of labor in agriculture, manufacturing and construction, and services .Productivity increases remain vital for Africa's post pandemic recovery and long-term prosperity. High and growing labor productivity is the basis for high and growing incomes, which are in turn a source for transformative

investments and consumption. Yet despite recent improvements, labor productivity remains low in many African countries[74].

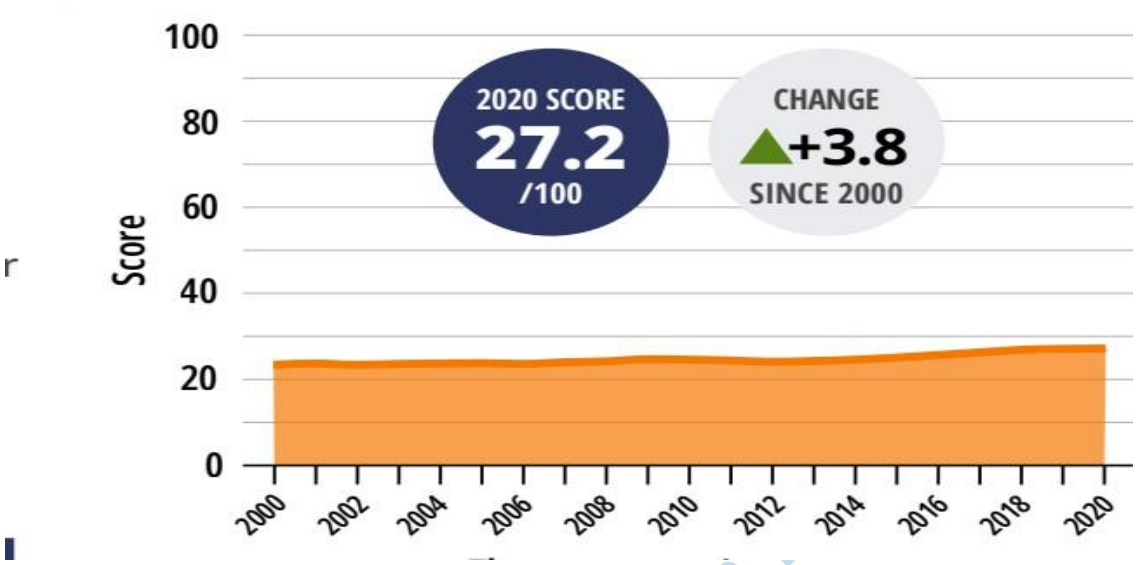



Figure2.2: Average African Productivity

Source[23]

The average African productivity increases score above is the average of the 30 economies tracked by the ATI. The productivity increases dimension measures labor productivity through three indicators (agriculture, manufacturing and construction, and services sectors), which are weighted according to the relative size of each sector.

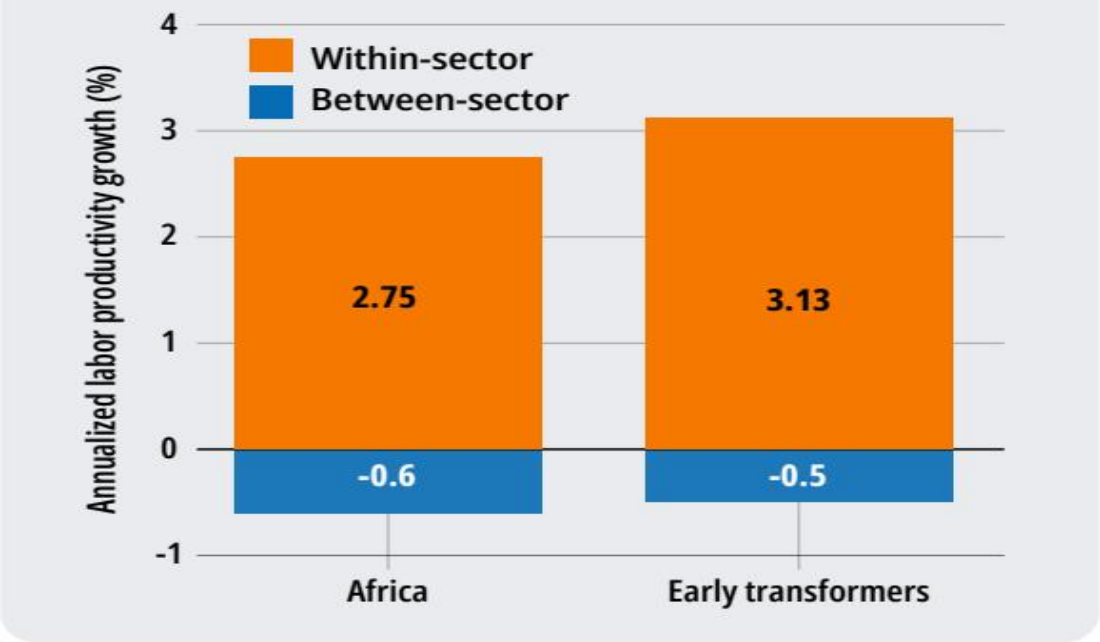



Figure 2.3: Average Labour Productivity Growth, 2000-2020

Source[23]

There are two types of productivity increases namely: within-sector and between-sector[71]. Most of the productivity growth in Africa has come from with-sector improvement, especially in agriculture. But between-sector productivity growth has been very low or negative. This has slowed down the overall growth of the economy and the creation of jobs

From a theoretical point of view, human capital is the driver of labour productivity, education plays vital role by increasing the stock of human capital of the population, inducing higher labor productivity and subsequently faster growth and lower poverty.

Sub Saharan African countries have much to gain from improving education to achieve inclusive growth. But many education indicators have stagnated and even deteriorated, and without a rapid acceleration of progress, the region will remain off track to achieve key education commitments by 2030 [71]. Dropout and out-of-school rates are higher in Sub Saharan Africa than in other world regions[75].

Sub-Saharan Africa has the highest rates of education exclusion of the six developing world regions. Over one-fifth of primary-age children are out of school, and almost 60 percent of youth between the ages of 15 and 17 are not in school. There are many barriers to education for low-income households. One of them is school fees, which unfortunately remain widespread in schools across Sub-Saharan Africa, causing financial stress to families[71]. Across Africa, 21 percent of enrolled students attend a private school, and that share is much higher in certain economies. Even in countries like Uganda, which offers free primary education, parents still have ancillary school expenses for uniforms, exam fees, school upkeep, books, or hiring an extra teacher. The cost of sending a child to school in Uganda varies from US$168 for government schools to US$420-680 for private schools. At the same time, more than 60 percent of adults in Uganda are very worried about school fees; for 40 percent of adults, school fees are the biggest source of financial worry. This is not surprising, as about 42 percent of Ugandans live below the poverty line of US$2.15 per day (about $785 per year).

Beyond SSAs poverty-reducing effect, building human capital can also reduce inequality. Higher educational attainment and lower inequality in education can reduce income inequality. By fostering social mobility, education gives greater opportunity to people to change their social status with better earning opportunities than their parents[71]. Sub Saharan African countries with a larger share of secondary or higher educated populations have lower wealth inequality in 2018[71]. Between 13 percent and 26 percent of the cross-country poverty variation can be explained by education, either the gap in returns to education and education premium between the bottom 40 percent and the highest 40 percent, or the mean years of schooling[76].

**Table 2.1:** Poverty and inequality decomposition by education (2015-2019)

| | Wealth inequality-Atkinson index (percent | Poverty (headcount percent) | Consumption Gini (percent) |
|---|---|---|---|
| Returns to education and education premium | 21 | 20-26 | 20-32 |
| Returns to education gap between the bottom 40 percent to the top 40 percent | 18 | 13 | - |
| Mean years of schooling | | 18 | - |

**Source:** African Development Bank (2020).

High income inequality can be explained partly by education inequality (unequal access to education) and unequal earning opportunities between the bottom and top segments of the wealth distribution. Indeed, additional education in the bottom 40 percent does not give the same opportunity of earning better income as in the top 40 percent [18]. The gap in the returns to education and the education premium is wide between the bottom 40 percent and the top 40 percent [18].

Overall, SSA has made steady progress in promoting human well-being. However, Africa still lags behind other regions of the world. The average human well-being score of 42.5 in 2020 was the highest among all dimensions. However, progress on human well-being has also been sensitive to external shocks.

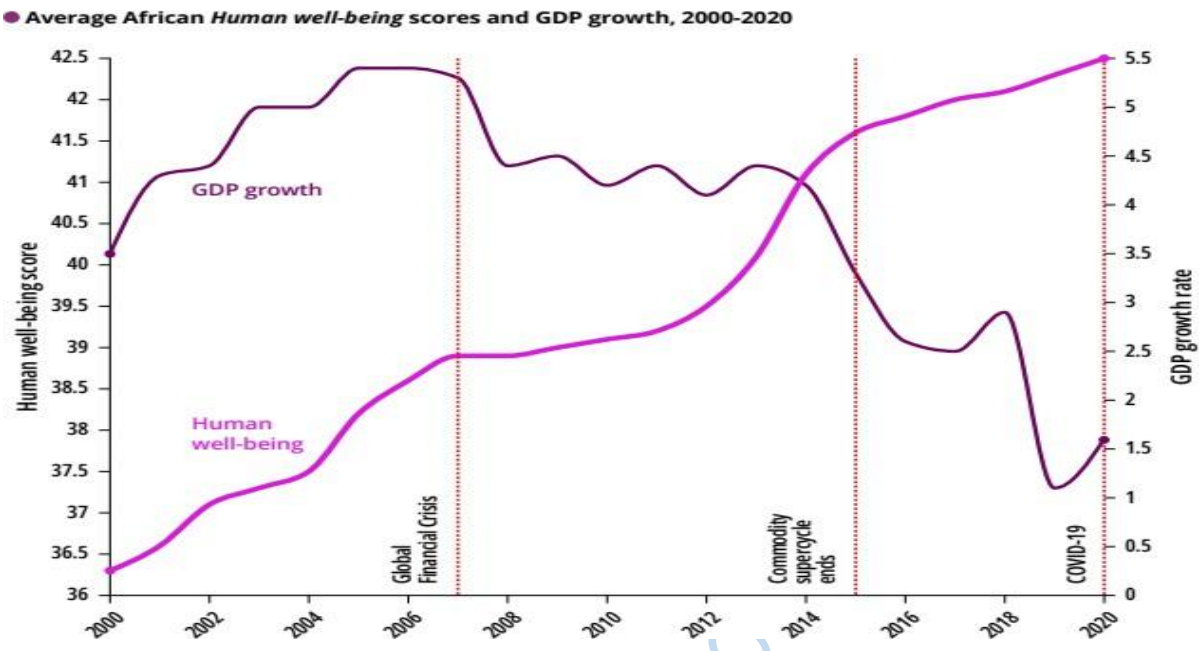



Figure 2.4 Average Human well-being scores and GDP growth, 2000-2020

Source[23]

The years of rapid improvement during periods of high economic growth were followed by years of much slower progress after economic crises[77]. Income inequalities remains critical in SSA countries. Closing income inequalities gap is ultimate goal of economic transformation and a major enabler of growth in SSA countries

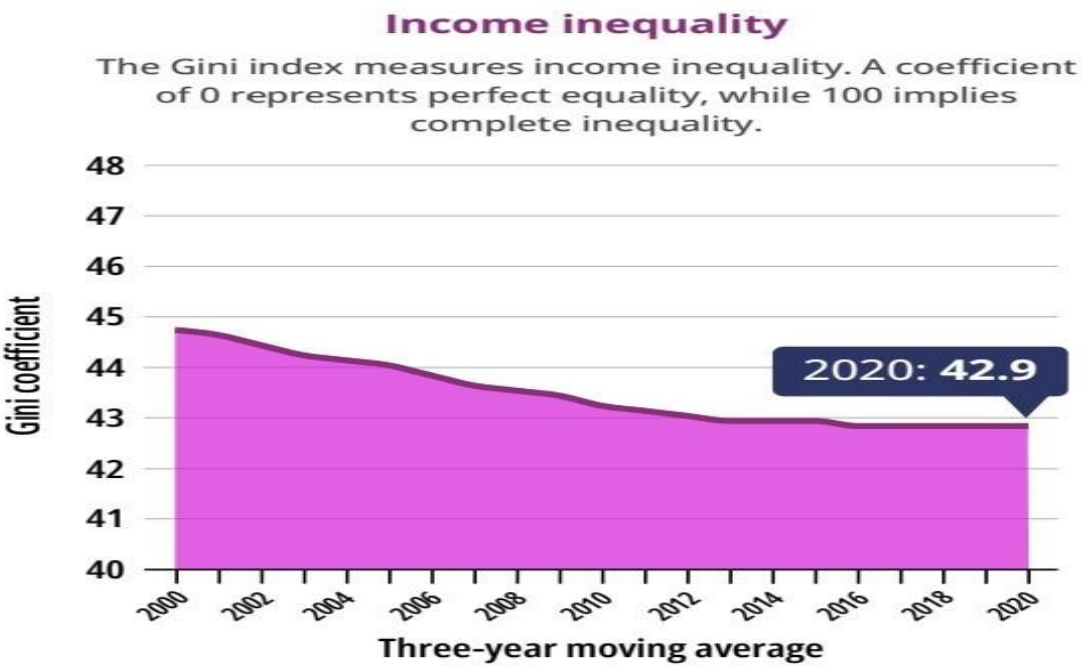



Figure 2.5: Income inequality, 2000-2020

Source[23]

The Gini coefficient scores of 44.8 in 2000 and 42.9 in 2020 suggest significant income inequality within Africa over the two-decade period. High income inequality often indicates disparities in access to education, healthcare, and other essential services, impacting human capital development. In regions with high income inequality, individuals from lower-income households may face barriers to accessing quality education and skill development opportunities. This lack of access to education can perpetuate intergenerational poverty and hinder socioeconomic mobility, ultimately impeding human capital development efforts.

Furthermore, income inequality has profound implications for poverty reduction approaches within Africa. The persistence of income inequality makes it challenging to implement effective poverty reduction strategies. Even with economic growth, the benefits may not reach those at the bottom of the income distribution, exacerbating poverty levels[54]. High levels of income

inequality can lead to social exclusion and marginalization, hindering efforts to lift people out of poverty. Therefore, addressing income inequality is essential for ensuring that poverty reduction efforts are inclusive and equitable, with a focus on reaching the most vulnerable and marginalized populations[71].

Moreover, income inequality can impact the trajectory of inclusive growth within Africa. Inclusive growth aims to ensure that economic growth benefits all segments of society, particularly the most vulnerable and marginalized groups[15]. However, high levels of income inequality can undermine the inclusivity of economic growth by concentrating wealth and opportunities in the hands of a few. This concentration of wealth can hinder social mobility and perpetuate cycles of poverty and inequality. Addressing income inequality is crucial for fostering an environment conducive to inclusive growth, where all individuals have the opportunity to participate in and benefit from economic development initiatives[45].

## 2.2 Theoretical Review

There have been several theories and concepts that provide theoretical linkage among human capital development, labor productivity and inclusive growth. Such theories include: Human capital theory and Inclusive growth (IG) approach.

### 2.2.1 Human Capital Theory

The main theory predicating the role of human capital development on productivity is the human capital theory. Human capital theory originates from the 1950s' difficulties in explaining productivity and economic growth in the US Economy. The human capital theory is mainly

inspired by a micro-economic study[82]. In his seminal work on human capital theory, he challenged the conventional understanding at the time that physical capital was the predominant factor behind growth in productivity in the US economy. He contended that human capital was instead the main factor explaining growth in productivity at the time In essence Becker's theory explains that human capital, through education, enhances productivity. One of the implied theoretical foundations of this theory is the role human capital plays in total factor productivity (TFP)[82].

Defined as the additional output in an economy that cannot be explained by employed factors of productions, TFP is explained indirectly by many human capital and growth theories. The common formulations of this theory are that human capital plays a principal role not only in increasing the productivity of labour itself but also the productivity of other factors of productions. In this perspective, Becker explains this role by acknowledging that, the extent to which individuals learn new skills and perfect old ones for productive purposes depends on human capital which enhances productivity of labour and other factors of production[81]. Furthermore, the models of human capital and productivity are built on the hypothesis that the knowledge and skills embodied in human capital directly raise productivity and increase an economy's ability to develop and adopt new technologies. This is consistent with the prediction of Becker[82].

The predictions of Solow's growth model and indicated that human capital omission in the model was the underlying reasons for its unrealistic predictions[82]. Solow's growth models had put forward the capital accumulation, labour, population growth and productivity as factor

explaining growth[83]. The model had explained that the level of savings and population growth determined the level of productivity and income per capita.

Other theories and models that focused on the mechanisms through which human capital contribute to productivity include two articles by Nelson and Phelps, and Lucas. They find important determinants of human capital growth at both micro and macro level. Lucas postulated that when human capital is put to use, a fraction of it contributes directly to productivity of labour whilst another contributes to the accumulation of future human capital[84].

Similarly, it was observed that the accumulation of human capital could increase the productivity of other factors and thereby raise productivity growth. In these models education has been the main channel through which efficient use of labour and other factors could lead to higher productivity[83]. The Lucas and the Nelson-Phelps approach study their own specific issues[83]. The two major issues are: 1) is growth primarily caused by either the level or growth of the human capital stock? and 2) which mixture of human capital is best to obtain high economic growth?

The Lucas and the Nelson-Phelps approach offer good starting-points to study more closely. Besides, the papers written by Benhabib and Spiegel, and Barro and Sala-i-Martin suggest that accepting one approach does not necessarily lead to rejecting the other. A new model combining both approaches might therefore produce interesting results. These two important approaches in the human capital theory can be distinguished: the Nelson-Phelps approach and the Lucas approach. Aghion and Howitt conclude that human capital is an important factor in economic growth and find two different effects: one effect comes from the *level* and another from the accumulationof human capital[83].

According to the Nelson-Phelps approach, growth depends on human capital endowments that have already been accumulated rather than on current human capital accumulation. The more human capital *per capita* a country has created, the higher the rate of innovation. The production factor of physical capital, *i.e.* past innovations, is the only factor used in the production of final commodities. Evidently, if the productivity of physical capital increases as a consequence of innovations, production can grow too. So, the level of human capital affects production growth.

Differences in growth rates between countries would be caused by differences in the level of the human capital stock. A single additional investment resulting in an increase of the human capital stock may cause a catch-up effect because the higher rate of innovation will bring about a permanent increase in production growth. This is why Aghion and Howitt argue that, in the Nelson-Phelps approach, the level of the human capital stock is mainly determined by the extent to which the labour force has obtained more than average qualifications, *i.e.* the skewness of the distribution of skills over workers. In other words, higher educated employees are responsible for innovations and thus for economic growth[84].

The Lucas approach mainly studies the significance of human capital accumulation to economic growth. According to Lucas, there are two sources of human capital: education and learning by doing. In his model, education is measured by the amount of time not used in production. Meanwhile, human capital can also be accumulated in the production process, because this causes learning by doing. In view of this approach, the human capital stock is considered to be an ordinary production factor, just like labour and capital. So, there is a direct relation between the level of production and the human capital stock, while production growth depends on the growth of the human capital stock. The significance of external effects in endogenous growth attracted special attention after two articles had been published by Romer and Lucas[83].

In both Nelson-Phelps articles, knowledge is of crucial importance. The Romer model regards the way growth is generated differently from the Lucas model. In the Romer model, knowledge is used in innovation, just as in the model developed by Nelson and Phelps,but the latter do not include external effects. This means that human capital is an input in the production of innovations, also called production techniques, blueprints or intermediary inputs. Therefore, investments in human capital only have an indirect, dynamic, effect on growth, because they increase labour productivity only through technological development[84]. In the Lucas model, however, the human capital stock and production are directly connected with each other, as are the growth rates of the two magnitudes.

Lucas endogenous growth by assuming that effectiveness and productivity of investments in human capital depend on the human capital stock, which has been created in the past, and time that is invested in new human capital. Thus, investment of time becomes more beneficial the more human capital has been accumulated. Besides this direct connection between human capital and labour productivity, there is an indirect connection, for individual investments in human capital induce positive external effects that contribute to endogenous growth[83]. These external effects take the form of learning by doing and therefore depend on both schooling and output: the longer workers have participated in schooling, the more knowledge is obtained in the production process[84].

However, Lucas supposes that if human capital investments take the form of schooling, they will induce two different effects[84]. One is the static effect, which means that schooling causes an increase in the productivity of employees who invest in schooling. The second effect is a dynamic one: schooling causes an increase in the productivity of the entire labour force. As individuals do not take account of this effect when deciding on their investments in human

capital, the effect is an externality. Yet, the dynamic effect as apparent in the Lucas model differs from that in the Nelson-Phelps approach. In the Nelson-Phelps model, however, "dynamics" occur within one period: labour productivity growth in period *t* depends on the level of human capital and the rate of innovation in the very same period[84]. Therefore, this approach does not appear to reveal real dynamic effects. It is Lucas who offers real opportunities to endogenise economic growth, since in the extreme case human capital growth depends exclusively on time and individuals' preferences[84]. The smaller time preferences are, the more consumption will be postponed and the larger the human capital stock will be. In the Nelson-Phelps model, the composition of human capital endowments is exogenously determined rather than endogenously, as in the Lucas-model. This is why the Nelson-Phelps model does not allow for actual endogenous growth. So, the Lucas model is an important supplement to the work of Nelson and Phelps.

The Lucas model is based on an individual utility function. He assumes that individuals maximize their utility and hence choose between consumption and production. The smaller individuals' time preferences are, the more they will postpone consumption and the more time they will use in production. Obviously, time is an important factor in the creation of human capital, because time can be spend either to attend initial education and continuing training or to produce output.



### 2.2.2 Inclusive Growth Approach

The IG analysis tries to identify ways to strengthen the productive resources and capacity of the individual on the labor supply side as well as ways to open up new opportunities for productive employment on the labor demand side[85]. If the main problem is lack of employment

opportunities for a particular group of individuals due to limited supply of certain types of labor skills, the constraints are related to the productive resources and capacity of individuals rather than the environment in which they can use these resources[86]. This situation calls for an in-depth employability analysis that will shed light on the resources of the individuals, such as the individuals' education and health and the other productivity attributes they bring to a job. If the main problem is low labor productivity or lack of employment opportunities for the individuals due to limited demand for labor, an analysis of the bottlenecks in the business environment is necessary[86].

The analysis distinguishes between self- or wage-employed and further looks at employment by sector, size of firm, rural/urban, formal/informal, and other relevant characteristics. A disaggregated look is necessitated by our main objective to identify the incidence of growth across the income distribution and the bottlenecks to the productive employment of individuals[87]. If the focus is on the poor, in the case of the self-employed, we undertake business environment analysis through the lenses of the small enterprises and micro firms. In the case of the wage-employed, we undertake an employability analysis as well as a business environment analysis through the lenses of a representative firm, potentially one that is employing the poor[87].

An important question is the extent to which the current employment status of an individual has a potential for future income growth, or if moving out of a low-income situation means finding another type of employment or employment in another sector[86]. The analysis therefore looks at external factors explaining the country's growth and poverty reduction pattern, the overall productivity dynamics in the country, the major challenges and opportunities, and possibilities for economic transformation and diversification. The analysis also considers constraints to those sectors with opportunities for productive employment, constraints affecting the ability to gain

employment in these sectors, and constraints affecting labor mobility across sectors and regions[86].

The IG approach takes a longer-term perspective. This is necessary because of the emphasis on improving the productive capacity of individuals and creating a conducive environment for employment rather than on income redistribution as a means of increasing incomes for excluded groups. Due to this longer-term perspective, there is an explicit focus on structural transformation and internal migration in the IG analytics framework. In developing countries, a significant part of growth is generated through reallocation of labor from low-productivity to high-productivity sectors[88].

With this longer-term perspective, it is important to recognize the time lag between reforms and outcomes. A good example is the lag between the time when investments in education are made and the time when returns from improved labor skills are collected[86]. This implies that the analysis must identify future constraints to growth that may not be binding today, but that may need to be addressed today in order to ensure sustainable and inclusive growth. In short, IG analytics is about policies that should be implemented in the short term but for sustainable IG in the future[86]. The goal is to identify a bundle of binding constraints rather than thebinding constraint and then sequence these constraints to enhance prospects for high, sustained IG in a country over a period of time.

There are some key concepts related to inclusive growth:

- Human Development Approach: The human development approach, introduced by Amartya Sen, emphasizes that economic growth should be seen as a means to expand human capabilities and freedoms. It emphasizes the importance of investing in education, healthcare, social protection, and empowering marginalized groups to ensure their active

participation in and benefit from economic growth[89]. The human development approach emphasizes that inclusive growth should prioritize the expansion of people's capabilities and freedoms, rather than merely focusing on economic indicators like GDP. It places individuals and their well-being at the center of development efforts. It recognizes that economic growth alone is not sufficient for human development and that investments in education, healthcare, social protection, and empowerment are crucial for inclusive outcomes.

- Pro-Poor Growth: Pro-poor growth theory focuses on designing policies and strategies that directly target poverty reduction and the well-being of the poor. It aims to ensure that the income and well-being of the poorest segments of society improve at a faster rate than the average, reducing poverty and inequality[90]. Pro-poor growth focuses on ensuring that the benefits of economic growth disproportionately reach the poorest segments of society. It aims to reduce poverty and narrow income inequalities. This approach emphasizes the need for policies that directly target poverty reduction, such as social safety nets, targeted education and healthcare programs, and inclusive financial services.
- Social Inclusion: The theory of social inclusion emphasizes the importance of removing barriers and ensuring equal opportunities for all individuals to participate in economic activities, access resources, and benefit from growth. It recognizes that certain groups, such as women, ethnic minorities, and persons with disabilities, may face social, economic, and institutional constraints that limit their participation and hinder inclusive growth[91]. Social inclusion is about creating an environment where all individuals have equal opportunities to participate in economic, social, and political activities. It aims to remove barriers and discrimination that marginalize certain groups. This concept

emphasizes the inclusion of women, ethnic minorities, persons with disabilities, and other disadvantaged groups, ensuring they have access to resources, services, and decision-making processes. It recognizes that inclusive growth cannot be achieved without addressing social exclusion and promoting social cohesion.

- Productive Employment: The concept of productive employment focuses on generating decent and quality employment opportunities as a means of inclusive growth. It emphasizes policies that promote job creation, address unemployment and underemployment, and improve the quality of work, including fair wages, social protection, and workers' rights[92]. Productive employment is a key aspect of inclusive growth, as it provides individuals with sustainable income, enhances their skills, and improves their overall well-being. It emphasizes the creation of decent work opportunities, fair wages, safe working conditions, and social protection measures for workers. This concept recognizes the need to address underemployment, informal work, and vulnerable employment, which are prevalent among marginalized groups.
- Human Capital Development: Human capital theory highlights the importance of investing in education, skills, and health to enhance human capabilities and productivity. By developing the skills and knowledge of individuals, societies can create an inclusive growth environment that promotes equal access to opportunities and enables individuals to participate fully in economic activities. It recognizes that individuals are the drivers of economic growth and that investing in their knowledge, skills, and health is essential for inclusive outcomes. Human capital development involves equitable access to quality education, lifelong learning opportunities, healthcare services, and the promotion of gender equality[93].

- Institutions and Governance: The theory of inclusive growth recognizes the role of institutions and governance in creating an enabling environment for inclusive development. Strong institutions, good governance, and effective policies are essential for ensuring equitable distribution of resources, protecting the rights of marginalized groups, and reducing corruption and rent-seeking behaviors[94]. Institutions and governance play a critical role in fostering inclusive growth. Strong institutions, good governance, and effective policies are necessary to create an enabling environment for inclusive development. This includes transparent and accountable institutions, rule of law, protection of property rights, anti-corruption measures, and inclusive decision- making processes. Institutions and governance shape the distribution of resources, access to opportunities, and the protection of rights, ensuring that inclusive growth benefits all segments of society[94].

- Sustainable Development: The theory of inclusive growth also encompasses the concept of sustainable development, which recognizes the interplay between economic, social, and environmental factors. It emphasizes the need to pursue economic growth in a manner that is environmentally sustainable, socially inclusive, and ensures intergenerational equity[95]. Inclusive growth is closely tied to the concept of sustainable development, which recognizes the interdependence of economic, social, and environmental dimensions.

These theories and concepts provide a framework for understanding and promoting inclusive growth, ensuring that economic progress is not only measured by GDP growth but also by the well-being and empowerment of all individuals within society.

### 2.2.3 Theoretical linkage between Human Capital Development and Inclusive Growth

Education and health determine the qualitative supply of labor and the prospects of the poor to seize opportunities in the economy in the longer term. Theoretically, education is expected to support individuals with knowledge and skills to engage in the production process, add to that high quality of education determines the extent to which individuals can contribute to productivity and get high incomes and thereby share in economic growth[96].

According to Nainggolan, with a good level of education, human resources can improve their quality of life through a process of education, training, and development that guarantees increased labor productivity, which guarantees sufficient income and well-being to increase the achievement of inclusive growth[97]. This is in line with the research by Maulana and Bowo, that increasing education will increase labor productivity and promote inclusive economic growth.

Health is another important dimension of human capital development and the health status of individuals can be a constraint to productive employment. The high prevalence of disease affects income growth negatively because it undermines the stock of available labor, its productivity and limits incentives for investments for future consumption (physical as well as human capital investments). Thus, poor health care provision, many of the infected individuals without access to healthcare and medications may unable to continue working productively. Poor quality and low levels of education and high prevalence of disease undermine the ability of the poor to seize economic opportunities hampers growth, especially inclusive growth[48]. The notion of inclusive growth is aimed at ensuring that the fruits of growth be shared to specifically eliminate poverty and eradicate income inequality. Inclusive growth is thus anchored in high and sustainable growth to create good employment opportunities and social inclusion to provide equal access to opportunities by all.

Based on the theory, for growth to be inclusive, productivity must be improved and new employment opportunities created[48]. The notion of productive employment highlighted in the first point has become central to the concept of inclusive growth, as it focuses not only on outcomes for poor people, but also on ensuring their participation in the growth process. As such, inclusive growth is related to the notion of broad-based growth across various sectors of an economy but also requires non-discriminatory participation by large segments of the population for its inclusivenessto be realized[59]. There is a strong theoretical linkage between human capital development and inclusive growth. This linkage is based on several key arguments and concepts:

- Productivity and Economic Growth: Human capital is considered a key determinant of productivity and economic growth. Investments in education and skills development can improve the productivity of individuals, leading to increased output and economic expansion. By enhancing human capital, countries can develop a skilled and knowledgeable workforce that is better equipped to adapt to technological advancements, innovate, and contribute to economic growth[84].

- Poverty Reduction and Income Inequality: Human capital development plays a crucial role in reducing poverty and income inequality. Access to quality education, vocational training, and healthcare can empower individuals from disadvantaged backgrounds to improve their skills, earn higher incomes, and escape the cycle of poverty. Moreover, by equipping individuals with the necessary skills, human capital development can reduce income disparities and promote a more equitable distribution of wealth in society[98].

- Social Cohesion and Social Mobility: Human capital development fosters social cohesion and enhances social mobility. When individuals have access to education and training opportunities based on merit rather than socio-economic background, it promotes a more

inclusive society. By breaking down barriers to education and skill acquisition, human capital development can provide individuals with the means to improve their social and economic standing, irrespective of their initial circumstances[99].

- Innovation and Technological Progress: Human capital is instrumental in driving innovation and technological progress, which are essential for sustained economic growth. A well-educated and skilled workforce is more likely to engage in research and development, adopt new technologies, and contribute to innovation. This, in turn, fuels productivity gains, creates new industries and job opportunities, and promotes inclusive growth.
- Health and Well-being: Human capital development encompasses not only education and skills but also healthcare and overall well-being. A healthy population is more productive, has a higher quality of life, and is better positioned to contribute to economic growth. Investments in healthcare, nutrition, and sanitation, along with education and skills development, form a comprehensive approach to human capital development, which positively impacts inclusive growth[100.]

In summary, the theoretical linkage between human capital development and inclusive growth is founded on the idea that investing in the knowledge, skills, health, and overall well-being of individuals leads to higher productivity, reduced poverty and inequality, enhanced social mobility, increased innovation, and improved economic outcomes for society as a whole. By prioritizing human capital development, countries can create the conditions for inclusive growth, where the benefits of economic progress are shared by all members of society.

### 2.2.4 Theoretical linkage between Human Capital Development and Labour Productivity

Theoretical linkage between human capital development and labor productivity lies in the idea that investments in education, training, and health improve the knowledge, skills, and health of the workforce, thereby enhancing their productivity[51]. According to human capital theory, individuals with higher levels of education and training are more productive because they possess specialized knowledge and skills that enable them to perform tasks more efficiently and effectively[4]. Additionally, improved health through better access to healthcare and nutrition can lead to reduced absenteeism and increased energy levels, further contributing to higher productivity levels[48]. Therefore, human capital development is seen as a crucial determinant of labor productivity, as it directly influences the abilities and capabilities of workers to contribute to economic output.

The theoretical linkage between human capital development and labor productivity can be best explained under the following sub-heading:

- Skill Acquisition: Human capital development, particularly through education and training programs, equips individuals with specialized skills and knowledge relevant to their respective fields. These acquired skills enhance workers' abilities to perform tasks efficiently and adapt to changing work environments, ultimately increasing their productivity[53].
- Innovation and Creativity: Education fosters innovation and creativity by encouraging critical thinking and problem-solving abilities. Workers with higher levels of education

are often better equipped to generate new ideas, implement innovative practices, and contribute to organizational growth and productivity[53].

- Technological Advancement: Human capital development is closely linked to technological advancement. Skilled workers are more capable of understanding and utilizing new technologies, leading to the adoption of advanced production methods and processes that can significantly enhance productivity levels[57].
- Health and Well-being: Investments in health and well-being, a crucial aspect of human capital development, can positively impact productivity. Healthy workers are less prone to illness and absenteeism, leading to increased attendance and higher levels of engagement and performance at work[60].
- Quality of Workforce: Human capital development contributes to the overall quality of the workforce. Workers with higher levels of education and training tend to be more motivated, adaptable, and capable of taking on challenging tasks, all of which contribute to improved productivity levels[53].
- Long-term Economic Growth: Human capital development is essential for sustaining long-term economic growth. A skilled and productive workforce attracts investment, drives innovation, and fosters competitiveness in the global marketplace, ultimately leading to sustained increases in productivity and overall economic prosperity[57].

Human capital development plays a fundamental role in enhancing labor productivity by improving skills, fostering innovation, promoting technological advancement, ensuring worker health and well-being, enhancing workforce quality, and contributing to long-term economic growth.

### 2.2.5 Theoretical linkage between Labour Productivity and Inclusive Growth

The main instrument for inclusive growth is assumed to be productive employment. Employment growth generates new jobs and income for the individual from wages in all types of firms, or from self-employment, usually in micro firms while productivity growthhas the potential to lift the wages of those employed and the returns to the self-employed. The ability of individuals to be productively employed depends on the opportunities to make full use of available resources as the economy evolves over time[45]. There is a theoretical linkage between labour productivity and inclusive growth, which can be understood through the following key points:

- Increased Production and Output: Higher labour productivity leads to increased production and output. When workers become more productive, they can produce more goods and services within the same amount of time. This increased production contributes to economic growth and can generate more opportunities for employment and income generation, which are essential for inclusive growth.
- Higher Wages and Standards of Living: Improved labour productivity often results in higher wages for workers. As workers become more productive, they can demand higher compensation for their increased contributions to production. Higher wages, in turn, lead to improved standards of living for workers and their families, contributing to inclusive growth by reducing poverty and promoting economic well-being.
- Technological Advancement and Innovation: Enhancements in labour productivity often go hand in hand with technological advancement and innovation. Businesses and industries strive to improve productivity by adopting new technologies, processes, and

organizational practices. These innovations can lead to the creation of new industries, products, and services, which generate employment opportunities and promote inclusive growth.

- Skills Development and Human Capital: Labour productivity is closely linked to the skills and human capital of workers. Investments in education, training, and skill development enhance the capabilities and productivity of the workforce. A skilled and educated workforce can adapt to new technologies, improve efficiency, and contribute to overall productivity growth. Moreover, providing equal access to education and skill-building opportunities for all individuals helps ensure that the benefits of productivity gains are inclusive and not limited to specific groups[101].Sectoral Shifts and Structural Transformation: Increases in labour productivity often result in sectoral shifts and structural transformations within an economy. As productivity rises in certain sectors, labor resources are reallocated from low-productivity sectors to high-productivity sectors. This reallocation can lead to job creation and economic diversification, fostering inclusive growth by expanding opportunities across different sectors and reducing disparities[102].
- Inclusive Labour Market Policies: To ensure inclusive growth, it is crucial to implement labour market policies that address inequality and promote inclusivity. Policies such as minimum wage regulations, social protection measures, and promoting decent work can help ensure that the gains from increased productivity are shared by all workers, including those from marginalized and vulnerable groups[103].

Conclusively, the theoretical linkage between labour productivity and inclusive growth rests on the understanding that higher productivity can contribute to economic growth and

improved standards of living. By promoting skills development, technological advancement, and inclusive labour market policies, societies can harness the benefits of increased labour productivity to achieve broader and more equitable growth that benefits all segments of society.

## 2.3 Review of Empirical Studies

Within the empirical literature, there are extensive research works and in some sense of conclusive debate on how human capital leads to improved labour productivity growth which in turn translates to inclusive growth. This study showcases a few of these studies with a view of identifying the point of convergence and divergence among the researchers on the subject matter of this study.

### 2.3.1 Human Capital Development and Labor Productivity

This subsection include empirical studies that specifically examine the relationship between investments in human capital, such as education, training, and skill development, and its impact on labor productivity. Empirical studies have consistently shown a positive relationship between human capital development and labor productivity. Investments in education, training, and skill development enhance individuals' knowledge and capabilities, leading to increased productivity in the workforce.

Notable studies include a study that investigate the impact of human capital on labour productivity in European Union member states using the Pooled ordinary least squares (OLS) and Fixed effects model (FEM). The results show that human capital is positively significant in improving the growth of labour productivity in the EU. It was also found that impact of human

capital development on productivity is bigger in countries with relatively low productivity level compared with countries that have relatively high productivity level. It can be assumed that this result is influenced by the high level of productivity achieved by RHP countries, i.e. there is probable that these countries have exhausted their productivity potential[58]. Other authors from the evidence in SSA suggest that poor human capital formation and low productivity levels result to little progress made in raising the levels of education in general and the levels of higher education in particular while human capital being crucial in the production processes, policies to increase productivity in SSA can be informed by the evidence on the effects of higher education human capital on productivity in this region[104].

A similar study conducted in Organization for Economic Cooperation and Development (OECD) countries by De la Feunte using average years of schooling as a proxy for human capital and biennial data in the period 1965-1995 as well as linking the Cobb-Douglas production function to the technical progress function, the study found that human capital had a large and positive coefficient value. The coefficient for Spain was higher than that of other OECD countries under investigation. The productivity share of human capital for Spain accounted for a 40% productivity gap and 30% for other OECD countries[60].

A study by Baier, Dwyer, and Tamura, spanning 145 countries across the world, used the growth accounting framework to compare the growth in output per worker and growth in physical and human capital. Assuming a constant return to scale, the study estimated the implied growth of output per worker from the growth of physical and human capital. Furthermore, in order to understand, the effects of physical and human capital on unexplained growth, the study estimated the difference between the output growth implied by a constant return to scale and the actual growth in output (the difference being TFP) The findings were that the weighted average TFP

from human capital and physical capital accounted only for 14% of the growth in output per worker with the rest (8%) being explained by the productivity of these factors of production[139]. Reporting these findings by region, the study found that TFP contributed to growth of output per worker by 34% in Western countries, 26% in Southern Europe and 26% in newly industrialized countries. In contrast, for countries in SSA and in East Asia, TPF contributed negatively to growth of output per worker, suggesting that more than just technology explained the growth of TFP in these countries[105].

.

A study for Malaysia was analyzed with data spanning from 2009 to 2012. The Generalized Least Squares (GLS) model was estimated and results showed that human capital improves labour productivity in Malaysia, while a greater impact was recorded for health than education[106].

In a study conducted by McGuirk, Lenihan, & Hart, the finding shows that investment in higher education enhances productivity in country. This finding is largely due to the endowment of physical capital rather than human capita[107]. The contribution of higher education human capital to productivity in Sub-Saharan African (SSA) countries was also investigated by measuring higher education human capital in two variables: higher education enrolment (HEE) and higher education graduations (HEG). The paper analyses a panel data of 30 SSA countries for the period 1980 -2015 using, a fixed effect Least Square Dummy Variable (LSDV) model, and a System Generalized Methods of Moments(GMM) model to verify empirically the claim that higher education human capital improves productivity in SSA. It is found that the impact of higher education (both HEE and HEG) on total factor productivity (TFP) in sub-Saharan Africa is mixed as it is positive for HEE and negative for HEG. The results on the impact of HEG suggest that higher education sector suffers from inadequate human capital that might not be put to use

for productive purposes. These results imply that the higher education in SSA needs to target skills that are more appropriate to the economies in these countries[108].

Other authors, investigated that life expectancy may have direct effects on labour productivity. These effects appear to be non-monotonic and depend on the level of demographic development[88].

A study for Malaysia was analyzed with data spanning from 2009 to 2012. The Generalized Least Squares (GLS) model was estimated and results showed that human capital improves labour productivity in Malaysia, while a greater impact was recorded for health than education[145.]

A comparison was done for Nigeria and South Africa, and it was discovered that both human and physical capital affect labour productivity in both countries, though South African productivity was more responsive to changes in physical capital. For Nigeria, school enrolment had a negative relationship with labour productivity [109]. The effect of human capital development on labour productivity in Nigeria was again analysed using three human capital proxies (life expectancy rate, tertiary enrolment and secondary school enrolment) between 1980 and 2016. Results from the ARDL estimation revealed that secondary school enrolment and life expectancy positively influence labour productivity in Nigeria in the long run while tertiary enrolment has positive influence on labour productivity in the short run[110].

### 2.3.2 Human Capital Development and Inclusive Growth

The link between human capital development and inclusive growth is well-established. By investing in education and skill development, societies can empower individuals, promote social mobility, and reduce income inequalities. Empirical studies have shown that human capital development contributes to poverty reduction, improved income distribution, and overall

economic development. It enables individuals from disadvantaged backgrounds to access better job opportunities, leading to inclusive growth.

The relationship between human capital, innovation, and inclusive growth in sub-Saharan Africa was explored using fixed-effects model to examine this relationship in 17 sub-Saharan African countries between 1998 and 2014. The results from the scatter plot suggest that human capital and innovation measures positively correlate with inclusive growth. More so, the empirical results show that different measures of human capital propel inclusive growth as the quality measures (total factor productivity and index of human capital) have significant impact. On innovation measures, the results reveal that investment and ICT positively influence inclusive growth; however, their magnitudes remain inconsequential. Regarding the interaction terms, the results indicate that the indirect impact of human capital through innovation was largely negative. Hence, this study reveals that the level of human capital is not large enough to promote innovative activities and technological advancement in the region[69].

In same vein, the relationship between human capital and inclusive growth was established using panel data from 22 SSA countries. The findings show that human capital positively influences inclusive growth in SSA region[73]. Relying on dataset for 18 SSA countries for the period 1995–2013, a study conducted on components of human capital and inclusive growth. The study found that augmenting health expenditure with natural resources makes the growth process more inclusive. In addition, education expenditure plays significant role in the growth inclusiveness in SSA region[86]. Based on the Fixed Effect Estimator, a study found that financing of healthcare had a greater impact on inclusive growth in 14 African countries between 1995 and 2012. However, population growth tends to destabilize any agenda toward inclusive growth[111].

In addition to the nexus between human capital and inclusive economic growth, empirical-evidence of the impact of unemployment, education, and poverty on inclusive growth in the period from 2015 to 2018 was obtained using the panel data model. The results of the analysis show that unemployment is determined by the number of unemployed persons (aged 15 years and over) who are not in employment, and is demonstrably unemployed. It has been shown that a significantly negative effect on inclusive growth, education, which is afflicted by the total number of attendance of community schools at all levels of primary, secondary and upper school, has a significant positive effect on integrative growth and poverty. This suggests that development related to education and the reduction of unemployment and poverty must be increased to achieve inclusive growth[112].

A study conducted using both descriptive and inferential statistics to examine the effect of human capital development on poverty in Nigeria. Results indicate a positive relationship between human capital development and poverty. This implies that, vibrant investment in human capital will not translate to poverty reduction instantly. Thus, the need to provide equal opportunities for inclusive growth which requires vibrant investment in human beings accompanied by increased employment opportunities, competitiveness and support for private sector engagement[113].

A similar analysis was conducted for Nigeria using the Error Correction Mechanism (ECM) and Johansen co-integration estimation techniques to examine the relationship between human capital and inclusive growth and how human capital can be a viable tool for driving the achievement of the Goal-4 of the United Nations Sustainable Development Goals (SDGs). The study employed annual data from 1981-2015. The result shows that human capital is statistically significant and has a long run relationship with the measure of inclusive growth[72]. In same

manner, the relationship between human capital and inclusive growth was investigated. From the analysis, it's evident that a positive relationship exists between human capital and inclusive growth, and theoretically, this is due to the fact that, human capital accumulation can raise the productivity of both labour and physical capital[53]. Besides, how human development can translate to inclusive economic growth was examined utilizing secondary data and descriptive statistical analytical tools. The findings indicate that the indices of human development and the knowledge economy recorded higher values in the emerging and developed countries than what exists in the developing countries. The study further shows that improvement in quantity and quality of education in general and higher education in particular for individuals to contribute to and benefit from economic growth[48].

More also, the impact of education and human capital (quantity and quality of education) on inclusive growth in Egypt during 1990-2020 was investigated, using the ARDL modeling approach with annual time series data. The study concluded that education quantity (primary and secondary school enrolment) has a positive impact on inclusive growth in both short run and over long run, Index of Human Capital per Person, has a positive significant effect over the long run. The inability to address educational issues may hinder the achievement of inclusive growth. This will further exacerbate the socio-economic problems such as unemployment, poverty, inequality amongst others. On other words it can be said that an increase in human capital and wide education enrollment will lead to an increase in labor productivity and inclusive economic growth[114]. Relying on dataset for 18 SSA countries for the period 1995–2013, a study found that augmenting health expenditure with natural resources makes the growth process more inclusive[86].

To establish whether investment in human capital factors contributes to inclusive growth in Botswana using multiple linear regression equations, the main finding was that human capital was positively and significantly related to national income and human welfare in Botswana. The implications for social change include informing policy makers on alternative growth strategies that could be adopted to promote inclusive growth, which, in turn, will benefit individuals who are unemployed and living in poverty[115].

### 2.3.3 Labor Productivity and Inclusive Growth

Labor productivity plays a crucial role in achieving inclusive growth. Higher productivity levels can lead to increased wages, job creation, and improved living standards, benefiting a wider segment of society. Empirical evidence suggests that productivity-enhancing factors, such as technological progress, infrastructure development, and efficient resource allocation, contribute to inclusive growth by generating employment opportunities and reducing poverty. Studies have demonstrates the positive relationship between labor productivity and economic growth, which in turn supports inclusive growth outcomes. Few among them include:

In a panel of 31 countries showed that fiscal redistribution, macroeconomic stability, trade openness, reduction in unemployment and increased productivity are important determinants of inclusive growth[116]. In a more recent panel analysis on inclusive growth, a study found evidence to suggest that fiscal redistribution, female labour force participation, productivity growth, FDI inflows, digitalization and savings significantly promote inclusive growth[90].

In terms of inclusive growth prospects, key concepts of inclusive economic growth and additional contributions made to develop frameworks for its measurement with particular relevance to Africa. This paper explores the literature of inclusive growth in the African context, from a socio-economic stand point. It attempts to establish the characterizations of inclusive

growth in Africa, its underlying arguments and prospects for future theoretical and empirical development[117].

Another study in a sample of 78 countries for the period 1980–2013also showed that human capital accumulation, the redistributive potential of tax-benefit systems, increases in multifactor productivity and labor force participation, as well as trade openness and institutional factors stimulated inclusive growth[118]. A study conducted using the Ordinary Least Square (OLS) technique for data ranging from 1970-2013. Findings showed a bidirectional causality existing between health and per capita income employed as a proxy for labour productivity. Conversely, a unidirectional causality was reported from education to per capita income[119].

## 2.4 Theoretical Framework

Based on the fact that the concept of inclusive growth is relatively new, It is therefore hard to identify theories that propose the way the selected variables (human capital development and labour productivity) influences inclusive growth. Also the analysis of factors determining inclusive growth is a new phenomenon that still lacks a well- established modeling framework.

The study therefore resorts to the adaptation of analytical framework developed for inclusive growth as well as infusing theoretical explanation on the expected relationship between the key variables (human capital development and labour productivity) and inclusive growth. Afterward, the study extrapolates such association to exist among the variables and inclusive growth.

This research study hinges on Anand, Mishra and Peiris's inclusive growth frame work adopted by Baruwa which lays emphasis on the pace and distribution on economic growth[1]. Thus for an economy to effectively and efficiently sustain its economic growth in reducing poverty, such

growth needs to be inclusive[2]. Inclusiveness entails fairness, equity, market protection and transition of employment which is a vital ingredient of any successful growth strategy[3]. The Anand, Mishra, and Peiris's (AMP) inclusive growth framework integrate equity and growth by using a utilitarian social welfare function drawn from consumer choice literature, as inclusive growth relies on two factors: (a) income growth; (b) income distribution. Following the theory of consumer where the indifference curves represent changes in aggregate demand over time, the AMP inclusive growth framework decomposes income and substitution effect into growth and distribution components. The framework outline two underlying properties of social welfare function to capture the following features: (a) it is increasing in its argument (to capture the dimension of growth); and (b) its suits the transfer property i.e. an income transfer from poor people to rich people curtails the function value which capture the distributional dimension.

The AMP inclusive growth framework was base on the concept of concentration curve. Concentration curve is a generalized Lorenz curve used to analyze the relationship among the distributions of different economic variables[4]. Following previous studies, the AMP inclusive growth framework defines a generalized concentration curve known as the social mobility curve as:

$$S^c = \left\lceil y_1, \frac{y_1 + y_2}{2}, \ldots, \frac{y_1 + y_2 + \ldots + y_n}{n} \right\rceil \tag{2.1}$$

The number of individuals in the population with income $y_1, y_2, \ldots, y_n$ is defined as $n$; $y_1$ indicate the poorest person, while $y_n$ represents the richest being. Thus, the generalized concentration curve mainly indicate the cumulative distribution of a social mobility vector $S = (y_1, y_2, y_3, \ldots, y_n)$ with an essential function $W \approx W(y_1, y_2, y_3, \ldots, y_n)$ *that* satisfies the two earlier stated properties to capture growth and distribution dimensions. Given that $S^c$ affirms the transfer properties; a

higher income distribution will constantly have a greater generalized concentration curve. Likewise, as it argues that social welfare function is increasing; high income will as well have a great generalized concentration curve. Likewise, as it argues that social welfare function is increasing; high income will as well have a greater generalized concentration curve.

The AMP inclusive growth framework employs a simple form of social mobility function through the computation of an index from the area under the mobility curve so as to capture the magnitude of income distribution changes. The index is stated as:

$$\bar{y}^* = \int_0^{100} \bar{y}_i d_i \tag{2.2}$$

The higher the income, the higher the ȳ* Meanwhile, ȳ* = ȳ, if people's income is the same (i.e. distribution of income is completely equitable). When ȳ is higher than ȳ*, it means that the income distribution is inequitable. Therefore, the departure of ȳ* from ȳ is a sign of unequal income distribution. The variation is proposed as income equity index and mathematically derived as:

$$\varpi = \frac{\bar{y}^*}{\bar{y}} \tag{2.3}$$

For a society that is completely equitable, ϖ =1. It therefore indicates that as ϖ moves closer to one (a greater value), it means higher income equality. Reorganizing equation (2.3), it is:

$$\bar{y}^* = \varpi \times \bar{y} \tag{2.4}$$

For an economy to witness inclusive growth, it needs an increasing ȳ* and this can be attained by; (a) a rise in ȳ i.e. increasing average income via growth; (b) a rise equity index of income (ϖ) by improving equity; or (c) the combination of increasing ȳ and ϖ i.e. a mix of (a) and (b).

This study therefore assumes that human capital development ensure inclusive growth through the output production channel. Following the argument of the endogenous growth theory, human capital development causes economic growth. Hence, human capital development is vital in enhancing inclusive economic growth and prosperity. Furthermore, literature has argued that the relationship between human capital development and inclusive growth is contingent upon the level of output level[4]. Employing the *AK* model to explain the link between human capital development and inclusive growth is conditional on output growth; this study first incorporates human capital development into the Cobb-Douglas production as an input factor. This is stated as:

$$Y = f(AK, L, H) \tag{2.5}$$

Where: $Y$ = output; $A$ for level of technology; $K$ for physical capital; $H$ for stock of human capital and $L$ represents labour force. The model is further stated as:

$$Y = f(AK^{\alpha}, L^{\beta}, H^{1-\alpha-\beta}) \quad \text{where: } \alpha, \beta > 0; \alpha+\beta < 1 \tag{2.6}$$

Taking the natural logarithm to derive:

$$\ln Y = \ln A + \alpha \ln K + \beta \ln L + (1-\alpha-\beta) \ln H \tag{2.7}$$

In mathematically form, equation (2.7) is specified as:

$$\bar{y} = \phi_0 + \alpha k + \theta h + \beta lb \quad [\text{Note: } \ln A = \phi_0, (1-a-\beta) = \theta] \tag{2.8}$$

As the previous noted that labour productivity and human capital development influence growth inclusiveness via income growth channel with the assumption of equal wealth distribution, equation (2.8) is substituted into equation (2.4) to get:

$$\bar{y}^* = \phi_0 + \alpha k + \theta h + \beta lb \quad (2.9)$$

The variables are the same as earlier specified and $\bar{y}^*$ depict inclusive growth. Based on the functional form of equation (2.9), in mathematical form including the disturbance term, time and country specific effect, it is therefore specified as:

$$\bar{y}^*_{i,t} = \phi_0 + \alpha k_{i,t} + \theta h_{i,t} + \beta lb_{i,t} \quad (2.10)$$

In the above theoretical equation, it shows that labour productivity through human capital development factors influences inclusive growth based on the level income growth and wealth distribution.

## 2.5 Conceptual Framework

The focus of this study is to examine the relationship among human capital, labour productivity and inclusive growth. Human capital development refers to the knowledge, skills, and abilities that individuals acquire through education, training, and experience. Investments in human capital, such as quality education, vocational training, and lifelong learning, enhance individuals' capabilities and productive capacities.

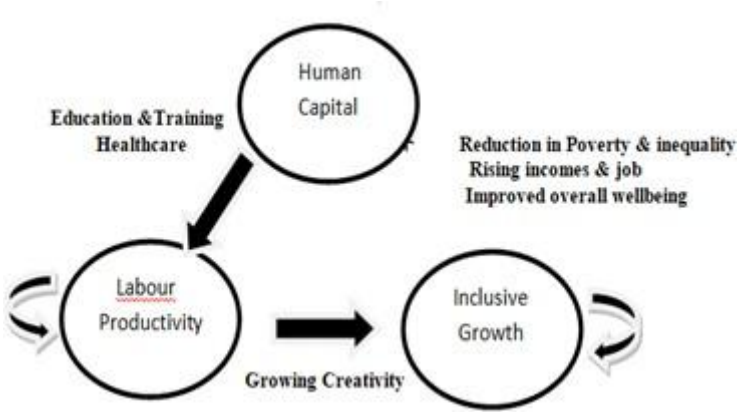



**Figure 2.7:** Conceptual framework
**Source:** Researcher (2023).

The above figure 2.7 depicts the relationships among human capital, labor productivity, and inclusive growth. There exists a feedback loop between human capital, labor productivity, and inclusive growth. Higher levels of human capital lead to increased labor productivity, which, in turn, supports inclusive growth. The figure shows how inclusive growth reinforces investments in human capital development, as it provides resources and opportunities for individuals to further enhance their skills and capabilities, thereby rising income and in the long run, reducing poverty level and inequality.

Thus, improved human capital positively influences labor productivity. Higher education levels, specialized skills, and innovation capabilities acquired through human capital development enhance workers' productivity and efficiency. Skilled workers are better equipped to adapt to new technologies, contribute to innovation, and engage in higher-value activities, leading to increased output per worker.

Labor productivity, driven by human capital development, plays a crucial role in fostering inclusive growth. Higher labor productivity leads to increased output, improved competitiveness, and higher incomes for individuals and households. Rising productivity levels create opportunities for employment, wage growth, poverty reduction, and enhanced living standards, contributing to inclusive growth. However, human capital development and higher labor productivity are essential drivers of inclusive growth, as they enable individuals to participate in economic activities, access better job opportunities, and share in the benefits of economic progress.

## 2.6 Summary of Gap in Literature Review

The review of the extant literature has confirmed the relationship that exist between human capital development and labour productivity or human capital development and inclusive growth, but studies testing the relationship among human capital development, labour productivity and inclusive growth is still sparse, especially in SSA countries. Thus, questions have been raised on the assumption of the link between human capital development and inclusive growth and attempts have been made to understand the mechanisms at which human capital improves quality of life and well-being so as to achieve inclusive growth.

From the foregoing literature, the role of labor productivity in enhancing inclusive growth is relegated to the background. Meanwhile, it has long been theorized that the main instrument for inclusive growth is assumed to be productive employment. Thus, human resources can improve quality of life through a process of education, training, and development that guarantees increased labor productivity, which guarantees sufficient income and well-being to increase the

achievement of inclusive growth. This formed the theoretical basis for empirical research into the relationship among human capital development, labor productivity and inclusive growth

To date, not much is documented on the quantitative effect of labor productivity on inclusive growth. From the empirical review done so far, this study observed that most of studies treated the variable of human capital, labour productivity and inclusive growth separately. As a result of this, the study seeks to fill that gap in the literature as follow: first, the study empirically examines the relationship that exists among human capital development, labour productivity and inclusive growth in SSA. Second, a broader index of inclusive growth is constructed for the selected SSA economies. Further, the unexplored quantitative relationship is estimated using the Arellano–Bover/Blundell–Bond system Generalized Method of Moments (GMM) estimator with robust standard errors. To the best of our knowledge, no known study has quantitatively modelled this panel dynamic relationship in the SSA sub-region. In addition, the results of the research depend on the analysis period, the methods of estimation, the measurement of human capital, inclusive growth and other parameters.

## Endnotes


1. R. Hippe. *Human Capital in European Regions Since the French Revolution: Lessons for Economic and Education Policies*. In Revue d'économie politique, 130(1), 2020, 27-50.

2. J. Pant, B. Shekar & M. Bagali. *Conceptual Analysis of the Theory of Human Capital: A New Dimension*. **Global Journal Communication Management Perspect**. 11(1), 2022.

3. G. S Becker "*Human Capital–A Theoretical and Empirical Analysis Human Capital–A Theoretical and Empirical Analysis*, published on Labour Economic & Labour Relations", 1975.

4. G. Becker. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education.* Chicago: University of Chicago Press, 1964.

5. S. Marginson. *Limitations of Human Capital Theory.* **tudies in Higher Education** 44, 2019, 287–301.

6. Y. Gruzina, I. Firsova & W Strielkowski. *Dynamics of Human Capital Development in Economic Development Cycles.***Economies.** 9(2), 2021, 67- 87. https://doi.org/10.3390/economies9020067

7. S. Tasheva &A. J Hillman. *Integrating Diversity at Different Levels: Multilevel Human Capital, Social Capital, and Demographic Diversity and their Implications for Team Effectiveness*. **Academy of Management Review** 44, 2019, 746–65.

8. S. Chikalipah & G. Okafor.*Dynamic Linkage Between Economic Growth and Human Development: Time Series Evidence from Nigeria*. **Journal of International Development,** 31(1), 2019, 22-38

9. T Joseph & P. Obikaonu. *Economic Growth and Quality Adjusted Human Capital Equation: Moderating Role of Social Capabilities in Africa*. **Applied Journal of Economics, Management and Social Sciences,** 2(2), 2021,1–9. https://doi.org/10.53790/ajmss.v2i2.19

10. B. Adeleye., I. Bengana., A. Boukhelkhal., M. Shafiq & H. Abdulkareem. *Does Human Capital tilt the Population-Economic Growth Dynamics? Evidence from Middle East and North African countries.***Soc Indic Res,** 162(2), 2022, 863–883. doi: 10.1007/s11205-021-02867-5.

11. S. Tasheva & A. J Hillman. *Integrating Diversity at Different Levels: Multilevel Human Capital, Social Capital, and Demographic Diversity and their Implications for Team Effectiveness*. **Academy of Management Review** 44, 2019, 746–65.

12. S. Kotsantonis & G. Serafeim. *Human Capital and the Future of Work: Implications for investors and ESG integration.***Journal of Financial Transformation**. 51(2), 2020, 115–30.

13. B. Surya, H. Hadijah, S. Suriani, B. Baharuddin, A. Tenri, F. Menn & E. Rasyidi. *Spatial Transformation of a New City in 2006–20:Perspectives on the Spatial Dynamics, Environmental Quality Degradation, and Socio—Economic Sustainability of Local Communities in Makassar City, Indonesia. Land* 9, 2020, 324.

14. C. Mastromarco & L. Simar. *Latent Heterogeneity to Evaluate the Effect of Human Capital on World Technology Frontier.***Journal of Productivity Analysis** 55(1), 2021, 71–89.

15. E. Osiobe. *A Literature Review of Human Capital and Economic Growth.***Business and Economic Research** 9, 2019, 179–196.

16. S. Barkhordari, M. Fattahi, & A. Azimi. *The Impact of Knowledge-Based Economy on Growth Performance: Evidence from MENA countries*. **Journal of the Knowledge Economy** 10, 2019, 1168–82.

17. Y. Yeo & J. Lee. *Revitalizing the Race between Technology and Education: Investigating the Growth Strategy for the Knowledge-Based Economy Based on a CGE analysis*. Technology in Society 62, 2020, 101-295.

18. V. Sima, I. Georgiana, J. Subi´c, & D. Nancu. *Influences of the Industry 4.0 Revolution on the Human Capital Development and Consumer Behavior: A systematic review***.** Sustainability1(2), 2020, 4-35.

19. T. Schultz *"The economic importance of human capital in modernization"*, 1993

20. G. k Becker., K. Murphy & R. Tamura," *Human capital, fertility, and economics growth",***Journal of Political Economy**, 5(98), 1990, 12-37.

21. A. Margarian., C. Détang-Dessendre., A. Barczak & C. Tanguy. *Endogenous Rural Dynamics: An Analysis of Labour Markets, Human Resource Practices and Firm Performance.* **SN Business Economic,** 2(8), 2022, 1–33. doi: 10.1007/s43546-022-00256-9

22. S. Wang., X. Lin., H. Xiao., N.Bu & Y. Li. *Empirical Study on Human Capital, Economic Growth and Sustainable Development: Taking Shandong Province as an example*. Sustainability, 14(12), 2022, 7221. doi: 10.3390/su14127221.

23. T. Karamabakuwa., R. Ncwadi & A. Phiri. "*The Human Capital-Economic Growth Nexus in SSA Countries: What Can Strengthen the Relationship"?* 2019. https//:mpra.ub.uni-muenchen.de/95199. Accessed 20/7/2021.

24. K. Mudassaar. *Human Capital and Economic Growth Nexus: Does Corruption Matter?* **Pakistan Journal of Commerce and Social Sciences (PJCSS),** 13(2), 2019, 409-418.

25. E. Prasetyo & R. Kistanti. *Human Capital, Institutional Economics and Entrepreneurship as a Driver for Quality & Sustainable Economic Growth*. **Entrepreneurship Sustain Issues**, 7(4), 2020, 25-75.

26. K. Kpognon & B. Mamadou. *Does Institutional Quality Contribute to Increasing Labour Productivity in Sub-Saharan Africa? An Empirical Analysis*. **Pan African University,** 2019. https://mpra.ub.uni-muenchen.de/98674/ MPRA Paper No. 98674.

27. U.S. Bureau of Labor Statistics. *What is Productivity? Labor Productivity,* 2023. https://www.bls.gov/k12/productivity-101/content/what-is-productivity/what-is-laborproductivity.htm#:~:text=Labor%20productivity,What%20is%20labor%20productivity%3F,used%20to%20produce%20that%20output.

28. Business Development Bank of Canada (BDC*). Labour Productivity,* 2023.https://www.bdc.ca/en/articles-tools/entrepreneur-toolkit/templates-business-guides/glossary/labour-productivity#

29. F.O Olarewaju., O.S Areo., A.A Ogundipe., T.Y Ogunbiyi & A. J Asaleye. *Capital and Labour Productivity: A Comparative Study of Nigeria and South Africa.***Asian Economic and FinancialReview**, 10(12), 2020, 1384-1395.

30. K. J SIÉ. *Industrial Policy and Labour Productivity Growth in Africa: Does the Technology choice matter?* Economic Structures 12, 10, 2023. https://doi.org/10.1186/s40008-023-00305-y

31. S. Klasen *"Measuring and Monitoring Inclusive Growth: Multiple Definitions, Open Questions, and SomeConstructive Proposals,"***ADB Sustainable Development Working Paper Series,** No. 12, 2010.

32. C.P. Ohanyere., C.L. Atueyi & I.O. Angela *Impact of Human Capital Development on Economic Sustainability in Nigeria.* **International Academy Journal of Business Administration Annals,** 7 (1), 2019, 68-77

33. Owyong, D. *Productivity Growth: Theory and Measurement.***APO Productivity *Journal***, 2014.

34. OECD. *Measuring Productivity: Measurement of Aggregate and Industry Level Productivity Growt*h. 2001. Available at: http://www.oecd.org/std/productivity-stats/2352458.pdf

35. Muhammad C. *Labour Force Participation and Economic Growth in Nigeria*. **Advances in Management & Applied Economics**, 10(1), 2020, 1-14.

36. N. B Azenui & C. Rada. *Labor Productivity Growth in Sub-Sahara African LDCs: Sectoral Contributions and Macroeconomic factors. Structural Changes Economic Dynamics*, 56, 2021, 10–26.

37. V. Inglesi-Lotz, & Toit. *The Evolution and Contribution of Technological Progress to the South African Economy: growth accounting and kalman filter application*. **Applied Econometrics and International Development**, 14(1), 2019.

38. K. Ogundari & T. Awokusi. *"Human Capital Contribution to Economic Growth in Sub-Saharan Africa: Does Health Status Matter more than Education"?***Economic Analysis and Policy**, 58, 2018,131-140.

39. S, Bruhn., T Grebel & L. Nesta. *The Fallacy in Productivity Decomposition*. **GREDEG Working Papers Series**, 39, 2021.

40. Gov.Scot. *Inclusive Growth: What does it look like? Economic Development Directorate. Part of Economy, Equality and rights***,** 2022. https://www.gov.scot/publications/inclusive-growth-look/#page-top

41. N. Lee, *"Inclusive Growth in Cities: A Sympathetic Critique,"* Regional Studies, 53(3), 2018, 424–34.

42. AFDB. *Measuring Inclusive Growth: From Theory to Applications in North Africa* 2016. www.afdb.org

43. V. Alekhina & G. Ganelli. *Determinants of Inclusive Growth in ASEAN*. ***Journal of the Asia Pacific Economy***, 2021. . https://doi.org/10.1080/13547860.2021. 1981044A

44. T. Jalles & L. de Mello. *Cross-Country Evidence on the Determinants of Inclusive Growth Episodes*. Review of Development Economics, 23(4), 2019, 1818–1839. https://doi.org/10.1111/rode.12605

45. World Bank *"The Growth Report: Strategies for Sustained Growth and Inclusive Development, Commission on Growth and Development,"* Washington DC, 2014. http://data.worldbank.org/data-catalog/world-development-indicators.

46. A. Campbell. *Inclusive Growth and Sustainable Human Development in Nigeria*. **Advances in Social Sciences Research Journal**, 4(7), 2017, 79-95.

47. OECD. *The Economy of Wellbeing: Remarks by Angel Gurría*, 2019.https://www.oecd.org/about/secretary-general/the-economy-of-well-being-icelandseptember-2019.htm

48. OECD. *Inclusive Growth. Centre on Well-being, Inclusion, Sustainability and Equal Opportunity (WISE),* 2023**.** https://www.oecd.org/inclusive-growth/

49. C. Anumudu. *The Impact of Human Capital on Labour Productivity in Manufacturing Industries in Enugu and Anambra States, Nigeria.* Being a Ph.D. Thesis Dissertation Submitted to the Department of Economics, Faculty of Social Sciences, University of Nigeria, Nsukka, in Partial Fulfillment of the requirement for the degree of Doctor of Phil, 2020.

50. OECD *Innovating Education and Educating for Innovation: The Power of Digital Technologies and Skills,* OECD Publishing, Paris 2016. http://dx.doi.org/10.1787/9789264265097-en

51. A. Campbell. *Investment in Human Capital for Inclusive Growth: Limitata or Illimitata Accessum to Sustainable Development.*Lead City Univsersity, Ibadan, 12th Inaugural Lecture, 2021

52. F. Munir, & S. Ullah. *Inclusive Growth in Pakistan: Measurement and determinants. The Pakistan* ***Journal of Social Issues*****, *6*(6), 2018, 150–162.** https://uog.edu.pk/downloads/journal/14_Inclusive_Growth_in_Pakistan_Measurement_and_Determinants_150-162. pdf

53. Scottish Government. '*Wellbeing Economy Governments: WeGo*', (2021) webpage. https://www.gov.scot/groups/wellbeing-economy-governments-wego/

**54.** Y. Huang & G. Quibria. *The Global Partnership for Inclusive Growth*. WIDER Working paper, 2022. http://hdl.handle.net/10419/81052.

55. O. Ezaal & V. Owede. *Human Capital Development and Labour Productivity in Nigeria*, 1980-2016. **Australian Research Journal of Humanities, Management and Social Sciences**. 11(1), 2019.

56. A. Mačiulytė-Šniukienė & Matuzevičiūtė. *Impact of Human Capital Development on Productivity Growth in EU Member States*. **Business, Management and Education,** 16(1), 2018, 1–12.

57. D. Bloom, D. Canning, D., & Sevilla, J. *The Effect of Health on Economic Growth: A Production Function Approach*. **Advances in Business-Related Scientific Research Journal (ABSRJ),** 5(2), 2014, 111-120

58. A. Dieppe. *Global Productivity: Trends, Drivers, and Policies. Washington, DC*: World Bank, 2021. https://openknowledge.worldbank.org/handle/10986/34015

59. M. Forbes, A. Barker & Turner, "*The Effects of Education and Health on Wages and Productivity"* Productivity Commission Staff Working Paper. Australian Government Productivity Commission, 2021.

60. Q.S Wang., Y.F Hua., R. Tao & N.C Moldovan. *Can Health Human Capital Help the Sub-Saharan Africa Out of the Poverty Trap? An ARDL Model Approach*. Frontiers in Public Health, 9, 642, 2021.

61. D. Creina & D. Steve. *Ageing Economics: Human Capital, Productivity and Fertility.* Agenda, 11(1), 2004, 3-20.

62. M.B Lieberman and J. Kang. *How to Measure Company Productivity Using Value-Added: A Focus on Pohang Steel (POSCO).***Asia Pacific Journal of Management**, 25(2), 2018, 209-224.

63. Tobias Knedlik. *Sustainable Development Goal Nine and African Development: Challenges and Opportunities.* LIT Verlag Munster, 2021 https://books.google.com/books?id=O3hMEAAAQBAJ

64. M. Wirajing., T. Nchofoung & R. Nanfoss. *Revisiting the Inequality-Well-being Nexus: The case of Developing Countries. Global Social Welfare*. 2023 doi: 10.1007/s40609-023-00278-7.

65. M.A Oyinlola, A. Adedeji & O Onitekun *Human Capital, Innovation and Inclusive Growth SSA Region*. **Economic Analysis and Policy**, 7(3), 2021, 609-625.

66. M. Oyinlola & A. Adedeji. *Human Capital, Financial Sector Development and Inclusive Growth in sub-Saharan Africa*. **Economic Change and Restructuring**, *52*(1), 2019, 43–66. https://doi.org/10.1007/ s10644-017-9217-2

67. African Development Bank (AFDB), *African Economic Outlook 2020 Developing Africa*'s Workforce for the Future 2020.

68. A. Owopet., O. Oyedele & S. Tella. *Human Capital Development and Inclusive Growth in Sub-Saharan Africa: The case for Health*. **Applied Journal of Economics, Management and Social Sciences,** 5(1), 2024, 28–38. https://doi.org/10.53790/ajmss.v5i1.90

69. S. C Aggarwal., D Satija & S. Khan. *Inclusive Growth in India-learning from best Practices of Selected Countries*. Working Paper, 2019

70. OECD, *The Productivity Inclusiveness Nexus.* Meeting of the OECD Council at Ministerial Level, 2016

71. U. Bayarbat & Y. Li. *Empirical Analysis of Relationship Between Per capita Health Expenditure and Economic Growth based on Vector Autoregressive Model (VAR) in Mongolia.* Theoretical Economics Letters, 10(1), 2020, 154-168.

72. UNESCO *"Funding Skills Development, the Private Sector Contribution*." Paris, 2018. https://unevoc.unesco.org/go.php?q=Publications

73. A. G Metu., E. Nwokoye., I.Innocent & P. Obidigwe. *Modelling the Inter-Links between Human Capital Investments and Inclusive Growth in Nigeria, 1980 to 2018*. University-Led Knowledge and Innovation for Sustainable Development, 2021.

74. UNESCO *"Who Pays for What in Education? The Real Costs Revealed through National Education Accounts."* Paris: UNESCO 2016. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000246277.

75. F. Mamoloko , C. Rangongo, & C. Ngwakwe. *Human Capital Investment and Economic Growth: A Testof Endogenous Growth Theory in Two Developing Countries.* ACTA UNIVERSITATIS DANUBIUS**,** 15(1), 2019.

76. K. Khan., S. Sabir & F. Ibrahim. *Human Capital and Inclusive Growth in the Selected Developing Countries.* New Horizons, 14(1), 2020, 81-106.

77. I.K Ofori & S.A Asongu. *ICT Diffusion, FDI and Inclusive Growth in Sub-Saharan Africa.***Telematics and Informatics**, 65(1), 2021, https://doi.org/10.1016/j.tele.2021.101718

78. World Bank. *Poverty and Equity Databank*, 2020. https:// databank.worldbank.org/source/poverty-and-equity

**79.** V. Alekhina & G. Ganelli . Determinants of Inclusive Growth in ASEAN. **Journal of the Asia Pacific Economy,** 2021. https://doi.org/10.1080/13547860.2021.

80. A. J Niekerk. *Inclusive Economic Sustainability: SDGs and Global Inequality*. Sustainability, 12(13), 2020, 5427.

81. World Bank. *World Development Report*. The Changing Nature of Work, 2019.

82. World Bank. *The Human Capital Project. (License: CC BY 3.0 IGO. ")*, 2018. https://openknowledge.worldbank.org/handle/10986/30498

**83.** World Development Indicators Databank. World Bank. 2020. from https://databank.worldbank.org/source/world-development-indicators

84. S. Akinbode, A. Dipeolu, T. Bolarinwa, & B. Olukowi. *Effect of Health Outcome on Economic Growth in Sub-Saharan Africa: A System Generalized Method of Moment Approach*. **Journal of Economics and Development,** 23(3), 2021, 254-266

85. I. Suhendra., N. Istikomah, R. Ginanjar & C. Anwar. *Human Capital, Income Inequality and Economic Variables: A Panel Data Estimation from a Region in Indonesia*. **The Journal of Asian Finance, Economics and Business (JAFEB)**, 7(10), 2020.

86. World Bank. World Development Report: *The Changing Nature of Work***.** 2019

87. I.K Ofori & S.A Asongu. *Repackaging FDI for Inclusive Growth: Nullifying Effects and Policy Relevant Thresholds of Governance*, ZBW - Leibniz Information Centre for Economics, Kiel, Hamburg, 2021. http://hdl.handle.net/10419/248546

88. A. Adedeji., M.O Bolarinwa & N. Olabisi. *Governance, Domestic Resource Mobilization, and Inclusive Growth in Sub-Saharan Afric*a. ***Economic Analysis and Policy,****65*1, 2020, 68–88. https://doi.org/10.1016/j.eap.2019.11.006

[89] M. Kovacevic & A. Jahic. *COVID-19 and human development. Exploring global preparedness and vulnerability. Human Development Report* Office. New York: United Nations Development Programme, 2020.

[90] International Labour Organization (ILO). *World Employment and Social Outlook* 2018: Greening with Jobs. International Labour Office, (2018).

[91] Y. Yeongjun & L. Jeong-Dong. *Revitalizing the Race Between Technology and Education: Investigating the Growth Strategy for the Knowledge-Based Economy based on a CGE analysis*. Technology in Society 62, 2020, 101-295.

[92] A. Campbell & E. Aderinto. *Human Capital Development and Labour Market Outcomes in Africa: Evidence from Sub-Saharan African Countries*. **Journal of Economics and Sustainable Development,** 13(6), 2022.

[93] T. Adoración Pérez. *Corporate Governance and Gender Diversity in Europe: A Strategic Win-Win Opportunity in the Fourth Industrial Revolution*. In The Fourth Industrial Revolution and Its Impact on Ethics. Edited by Katharina Miller and Karen Wendt. Cham: Springer, 2021, 33–55.

[94] L. Chapelain., A.Charlotte & S. Matéos. *Schultz and the Concept of Human Capital: An Intellectual Trajectory*. Revue d'economie Politique 130, 2020, 5–25.

[95] H. McGuirk., Lenihan, H., & Hart, M. *Measuring the Impact of Innovative Human Capital on Small Firms' Propensity to Innovate*. **Research Policy,** 44(4), 965-976. 2019 https://doi.org/10.1016/j.respol.2014.11.008

[96] G. Akinola and Josue Mbonigaba. *Human Capital in the Sub Saharan African Countries: Productivity and the Policy Implications* AUDŒ, 15(1), 2019, 163-185.

[97] F. Olarewaju, Areo, S., Ogundipe, A. Ogunbiyi, T. & A. Asaleye,. *Capital and Labour Productivity: A Comparative Study of Nigeria and South Africa.***Asian Economic and Financial Review**, 10(12), 2020, 1384-1395.

[98] E Okowa, & Vincent, M. O. *Human Capital Development and Labour Productivity in Nigeria*. **Australian Research Journal of Humanities, Management and Social Sciences** 11(1), 2019, 142-155.

[99] O.A Adeosun., P.A Olomola., A. Adedokun & O.S Ayodele. *Public Investment and Inclusive Growth in Africa*. **International Journal of Social Economics**, *47*(12), 2020, 1669–1691. https://doi.org/10. 1108/IJSE-05-2020-0333Akobeng,

[100] T. Andrian *"Unemployment, Education, Poverty, and Inclusive Growth":Evidence from Provinces in Indonesia* .**Article in International Journal of Psychosocial Rehabilitation,** 2020.

[101] O. Campbell & I. Ojo "*Human Capital and Poverty in Nigeria"* Working Paper in Progress2021.

[102.] M. Mamdouh Abdelmoula &M. Abdelsalam *"Education and Human Capital on inclusive growth in Egypt During period 1990-2020"* (Econometrics Study), MASF 11(2), 1-26, 2022.

[103.] Sarpong & E. Nketiah-Amponsah. *Financial Inclusion and Inclusive Growth in Sub-Saharan Africa*. Cogent Economics & Finance, 10(1), 2022, 2058734, DOI:10.1080/23322039.2022.2058734

[104.] C. Aoyagi, & G. Ganelli *"Asia's Quest for Inclusive Growth Revisited"*.**Journal of Asian Economics**, 40(C), 29–46, 2015**.** https://doi.org/10.1016/j.asieco.2015.06.005

[105.] Nicholas Ngepah,. *A Review of Theories and Evidence of Inclusive Growth: An Economic Perspective for Africa.* For**: COSUST 2021 Special Issue on** 'Inclusive Development.

[106.] M. Simon. *Limitations of Human Capital Theory*. Studies in Higher Education 44, 2019, 287–301.

[107.] A.A. Sajoh. *The Effect of Human Capital on Economic Growth in Some Sub Sahara African countries (SSA*). **American Journal of Economic,** 5 (1), 2021, 1-24.

[108.] X. Lin., Z. Ahmed., X. Jiang & U.K. Pata *Evaluating the Link between Innovative Human Capital and Regional Sustainable Development: Empirical Evidence from China*. **Environmental Science Pollution. Control Service**, 30, 2023, 97386-97403.

[109.] S. Abel., N. Mhaka & P.L. Roux. *Human Capital Development and Economic Growth Nexus in Zimbabwe.Southern* African Business Review, 23, 2019.

[110.] M. Wirajing., N. Nchofoung & M.Etape. *Revisiting the Human Capital–Economic Growth Nexus in Africa.* SN Business Economic, 3(7), 2023, 115.

[111.] K. Fukao., T. Makino & T. Settsu. Human *Capital and Economic Growth in Japan: 1885–2015*. **Journal of Economic Surveys**, 35(3), 2021, 710-740.

[112.] J. Garza-Rodriguez., N. Almeida-Velasco., S. Gonzalez-Morales & A.P Leal-Ornelas. *The Impact of Human Capital on Economic Growth: the Case of Mexico*. **Journal of the Knowledge Economy,** 11(2), 2020, 660-67.

[113.] E.A Hanushek & L. Woessmann. *Education, Knowledge Capital, and Economic Growth. In The Economics of Education*. Academic Press, 2020, 171-182.

[114.] S, Marginson. *Limitations of Human Capital Theory*. Studies in Higher Education, 44(2), 2019, 287-301.

[115] E.U Osiobe. *Human Capital, Capital Stock Formation, and Economic Growth: A panel Granger Causality Analysis*. **Journal of Economic and Business,** 3 (2), 2020. https://ssrn.com/abstract = 3581793

[116] E. Rakhmatillo., K. Anvar & M.Sukhrob. *Foreign Direct Investment, Economic Growth and Employment: VAR Method for Uzbekistan*. **Journal of Contemporary Issues,** 27 (2), 2021. doi: 10.47750/cibg.2021.27.02.187

[117] N. Faruk., N.T Surajudeen-Bakinde., A. Abdulkarim., L. Oloyede., Olawoyin., O.W Bello & Edoh. *Rural Healthcare Delivery in Sub-Saharan Africa: An ICT-driven Approach*. **International Journal of Healthcare Information Systems and Informatics**, 15(3), 2020, 1-21.

[118] E. Uneze, E. *The Relation between Capital Formation and Economic Growth:* Evidence from Sub-Saharan African Countries. *Journal of Economic Policy Reform*, *16*(3), 2020, 272–286. https://doi.org/10.1080/17487870.2013. 799916

# Chapter Three

# Methodology

This chapter presents the methodological analysis of this research study. It begins with the theoretical framework used to establish the links among human capital development, labour productivity and inclusive growth. Afterward, it discusses the model specification which was specified for each objective. Other sections include theoretical expectation, data measurements and sources, and estimation procedures to analyze the study's objectives.

## 3.1 Model Specification

The empirical model designed for this research study are specified based on the specified research objectives in chapter one. Following the theoretical framework in chapter two, this study relies on the equation (2.10). The equation (2.10) can be re-specified as follows:

$$\bar{y}^{*}_{i,t} = \phi_0 + \alpha k_{i,t} + \theta h_{i,t} + \beta lb_{i,t} \tag{3.1}$$

### 3.1.1 Empirical Model of Human Capital Development and Labour Productivity

Following the equation (3.1) above, variables of human capital and labour productivity can be integrated into the equation. The functional relationship between human capital development and labour productivity as:

$$gdpppe_{i,t} = \pi_0 + \pi_1 hcd_{i,t} + \pi_2 gfcf_{i,t} + \mathrm{B}ctv_{i,t} + \varepsilon_{i,t} \tag{3.2}$$

Where: *gdpppe*is GDP per person employed (measured labor productivity), *hcd* represents the vector of human capital development which consist of input factor of human capital development such as government expenditure on education, government expenditure on health as well as output factors of human capital development (such as primary school enrolment, secondary

school enrolment, life expectancy, infant mortality), *gfcf*represents gross fixed capital formation and *ctv* is the vector of control variables which include employment rate, interest rate spread, inflation rate and trade openness measured by total trade to GDP. The stochastic term is represented by ε; *t* denotes time and $\pi_0, \pi_{1-2}, \mathrm{B}$ are parameters.

### 3.1.2 Empirical Model of Human Capital Development and Inclusive Growth

Based on the equation (3.1), the links between human capital development and inclusive growth, the equation is stated as follows:

$$incg_{i.t} = \lambda_0 + \lambda_1 gfcf_{i,t} + \lambda_2 hcd_{i,t} + \Phi ctv_{i,t} + \mu_{i,t} \quad (3.3)$$

Where: *incg*is inclusive growth, *gfcf*represents gross fixed capital formation, *hcd* represents the vector of human capital development which consist of input factor of human capital development such as government expenditure on education, government expenditure on health as well as output factors of human capital development (such as primary school enrolment, secondary school enrolment, life expectancy, infant mortality), and *ctv* is the vector of control variables which include employment rate, interest rate spread, inflation rate and trade openness measured by total trade to GDP. The stochastic term is represented by $\mu$; t denotes time and $\lambda_0, \lambda_{1-2}, \Phi$ are parameters.

### 3.1.3 Empirical Model of Labour Productivity and Inclusive Growth

The equation (3.1) specifies inclusive growth as a function of labour productivity and control variables. It is stated as follows:

$$incg_{i.t} = \varpi_0 + \varpi_1 gfcf_{i,t} + \varpi_2 gdpppe_{i,t} + \Pi ctv_{i,t} + e_{i,t} \quad (3.4)$$

Where: *incg*is inclusive growth, *gfcf*represents gross fixed capital formation; *gdpppe* denotes labor productivity measured by GDP per person employed; *ctv* is the vector of control variable which include domestic credit to private sector, interest rate spread, inflation and trade openness measured by total trade to GDP. The stochastic term is represented by *e*, *t* denotes time, and $\varpi_0, \varpi_{1-2}, \Pi$ are coefficients of the variables.

### 3.1.4 Empirical Model of Joint Effect of Human Capital Development and Labour Productivity on Inclusive Growth

The empirical model that establishes the interactive effect of human capital development and labour productivity is stated as follows:

$$incg_{i.t} = \delta_0 + \delta_1 gfcf_{i,t} + \delta_2 hcd_{i,t} + \delta_3 gdpppe_{i,t} + \delta_4 \left(hcd \times gdpppe\right)_{i,t} + \Theta ctv_{i,t} + v_{i,t} \qquad (3.5)$$

Where: *incg*is inclusive growth, *hcd* represents the vector of human capital development which consists input factors of human capital development such as government expenditure on education, government expenditure on health as well as output factors of human capital development (such as primary school enrolment, secondary school enrolment, life expectancy, infant mortality), *gdpppe*is GDP per person employed (measured labor productivity), *gfcf*represents gross fixed capital formation, *hcd*×*gdpppe*is joint effect of human capital development and labor productivity; *ctv* is the vector of control variables include which are employment rate, interest rate spread, inflation rate and trade openness measured by total trade to GDP. The error term is represented by *v*; *t* denotes time and $\delta_0, \delta_{1-4}, \Theta$ are parameters.

## 3.2 Measurement of Inclusive Growth

In this study, the measurement of inclusive growth framework combines monetary (income) and non-monetary (jobs) benefits from economic growth and aggregates them across individuals with different characteristics[5]. The same indicator has been used by several scholars to capture inclusive growth[6]. It model not only monetary and fiscal determinants but also structural policies to foster equitable growth, we add equality and adopt an ad hoc weighting scheme for the construction of the composite index of inclusive growth. Composite index is based on a scoring methodology and a weighting scheme implicitly involves value judgment[5].

Our composite index is constructed on a weighting scale of 0–10, based on the importance of each indicator in the collection. Table 3.2.1 presents the weights assigned to the four broad pillars of inclusive growth. The construction of the composite index of inclusive growth is shown in Table 3.6.

**Table 3.2.1:** Selected indicator for computation of inclusive growth index

| **Components ($C_k$)** | **Indicators** | **Data sources** |
|---|---|---|
| **Monetary Dimension** | | |
| Economic Growth | Growth of GDP per capita | WDI |
| Income distribution | Equality (1- Gini coefficient) | WDI |
| **Non-Monetary Dimension** | | |
| Job | Employment to population ratio (% of 15+) | WDI |

**Source:** Author's compilation (2023).

### 3.2.1 Description of Inclusive Growth Components

- **Monetary Indicator**

**Economic growth:** The growth of GDP per capita is indispensible in advancing inclusive growth, as this is the basis for creating and expanding economic opportunities[6]. Since success in

this dimension lays the foundation for progress in many other dimensions, this study allocates a substantial weight of 50% to the growth of income per person in the overall composite index.

**Income Distribution:** The recent movement toward inclusive growth strategic framework implies that the traditional focus on addressing income inequality has been regarded as too limiting. Policy makers have been under pressure to craft development strategies that respond to the needs of a much broader segment of the population. This new broader orientation also responds to the widespread recognition of the need of income and wealth equalities have been rising in many developing countries[6]. To add equality into a greater inclusiveness, we used Gini coefficient (commonly used measures that capture the level of income inequality) subtract from 1to arrive at equality. A total weight of 25% is assigned to equality for the study's overall inclusive growth composite index.

- **Non Monetary Indicator**

**Employment Variable:** One significant aspect of inclusiveness is represented by the employment content of economic growth. Employment opportunities are a critical aspect of inclusive growth. To capture employment, we use the employment rate to population ratio. Accordingly, we assigned a weight of 25% to employment in the overall composite index of inclusive growth.

**Table 3.2.2:** Definitions, source and expected relationship of other covariates

| Variables | Measurement | Source | Expected Relationship |
|---|---|---|---|
| Education variables | Gross primary enrolment rate | World Development Indicators | Positive |
| | Gross secondary school enrollment rate | | |
| Health variable | life expectancy rate | World Development Indicators | Positive |
| | Infant mortality | | Negative |
| Capital expenditure | Government expenditure on education | World Development Indicators | Positive |
| | Government expenditure on health infrastructure | | |
| Employment variables | Employment rate | World Development Indicators | Positive |
| Labour productivity | GDP per person employed | World Development Indicators | Positive |
| Growth | GDP per capita income | World Development Indicators | Positive |
| | Income equality | | Positive |
| Real physical formation (Investment) | Gross fixed capital formation | World Development Indicators | Positive |

**Source:** Author's compilation (2023).



### 3.3 A'Priori Expectation

Here, we highlight the theoretical relationship between the explanatory variables and the explained variable. Following the theoretical underpinning the variables used, it is revealed that both human capital development and labour productivity have positive and significant relationship with inclusive growth. The apriori expectations for equation (3.4) are as follows:

$\delta_1 > 0$, $\delta_2 > 0$, $\delta_3 > 0$, $\delta_4 > 0$, $\delta_5 > 0$ $\delta_0$ is the intercept

Where

$\delta_1, \delta_2, \delta_3, \delta_4, \delta_5$,.....are coefficient parameters.

The interaction term has a unique coefficient, it is expected that all explanatory variables and control variables have positive and significant relationship with inclusive growth except infant mortality.

### 3.4 Source of Data

This study tends to employ panel data set that covers twenty- three years from 1999 to 2021. The selected timeframe (1999-2021) was chosen because the period aligns with the transition from the Millennium Development Goals (MDGs) in 2015 to Sustainable Development Goals (SDGs). Thus, make it a crucial period in international development efforts. The SDGs served as a global framework for addressing global challenges and promoting equitable economic opportunities, social inclusion and sustainable development. By addressing inequalities and ensuring that no one is left behind, inclusive growth plays a crucial role in achieving the overarching objectives of the SDGs. The study employs panel annual secondary data that contains information on the same cross section units of thirty two (32) SSA countries. Panel data analysis provides comprehensive tools to examine how relationship between variables change dynamically and check the dynamics of adjustment[6]. These data are sourced majorly from World Development indicators (2023), International Labour Organization (2022), United Nation Population Division, Department of Economic and Social Affairs (2023).

## 3.5 Estimation Technique

### 3.5.1 Panel Data Analysis

Panel data consists of a set of cross-sectional units which are observed from time to time and a combination of time series and cross-section data. In other words, panel data has observations on individual micro-units who are followed over time[7]. Panel data has several benefits such as it is controlling for individual heterogeneity which time series cannot accommodate, panel data give more informative, and more variability, less collinearity among the variables, more degrees of freedom and more efficiency[8]. Panel data allowed us to control for all shared period factors and time-invariant country-specific factors and provides primary reasons behind the use of panel data usually include: it generally accommodates group and not the individual units in the group which means that very little information is lost by taking the panel perspective[8]. Panel estimation techniques take heterogeneity among units in the panel into account by allowing for subject-specific variables. If each cross-sectional unit has the same number of time series observations, the panel data is called a balanced panel and if the number are different between observations it is called unbalanced panel[8].

### 3.5.2 Estimation Approach

This study utilizes the panel system generalized methods of moments (GMM) introduced by econometricians to calculate the elasticities of the parameter estimations in the four empirical models[9,10]. It is noteworthy that the aforementioned empirical models were designed to achieve specific aims. These models utilized the variables *t*(representing time series) and *i*(representing country units) to represent the characteristics of time series and cross-sectional data, respectively. Empirical models (3.1), (3.2), (3.3), and (3.4) are similar to the equation below:

$$y_{i,t} = \beta + Z'_{i,t}\phi + \nu_{i,t} \quad \text{where: } i = 1,...,N;\ t = 1,...T \tag{3.5}$$

Where: $\beta$ is the scalar; $\phi$ is a row vector $K \times 1$; $Z'_{i,t}$ denotes the $i$th observation on the $K$-independent variables at different time $t$ periods; $\nu$ represents the stochastic term. Furthermore, the stochastic factors consist of two components: the unobserved country-specific impact ( $u_i$ ) which captures individual effects not accounted for in the regression model, and the idiosyncratic disturbance ($\upsilon_{i,t}$ ) which differs across countries and time periods. Equation (3.5) can be restated as:

$$y_{i,t} = \beta + Z'_{i,t}\phi + u_i + \upsilon_{i,t} \quad \text{where: } i = 1,...,N;\ t = 1,...T \tag{3.6}$$

The equation can be estimated using either the panel fixed or random effects, depending on two factors: (a) the distribution of the unobserved components and the error term, and (b) the idiosyncratic disturbance process of the time series across the nations. Given that the data was not chosen randomly, the fixed effects method is deemed the most suitable for the baseline model. The technique presupposes that the parameter $u_i$ is held constant, while the error term $\upsilon_{i,t}$ follows an independent and identically distributed $[IID(0,\sigma^2_u)]$. Also, the explanatory variables are not influenced by random factors for each individual and throughout time. Cross-weights are employed to rectify individual heteroskedasticity and serial correlation of error components in order to establish efficient and consistent parameters.

**Table 3.5.2:** Correlation coefficient of outcome variable and its first lag

| | *Inclusive growth* | *Inclusive growth(-1)* |
|---|---|---|
| *Inclusive growth* | 1 | |
| *Inclusive growth(-1)* | 0.9418 | 1 |

**Source:** Author's computation (2023).

In addition to addressing endogeneity concerns, there are five variables that drive the utilization of system GMM in this study: (a) This approach is regarded as a reliable method for dealing with persistent issues in the dependent variable. In order to identify variables with high persistence, it is necessary for the correlation coefficient between the value and its first lag to exceed the threshold value of 0.800. Table 3.5.2 demonstrates a high level of persistence in the dependent variables, with values above 94.17%. (b) The estimation approach is suitable for studies with a bigger number of cross sections (N) than time periods per individual (T), specifically when N (32) is more than T (23). The strategy is also appropriate for managing potential endogeneity issues in the regressors. (d) The estimating technique does not remove the differences between countries. (e) The fourth advantage of the system GMM by Arellano and Bover, and Blundell and Bond is that it is a better match compared to the difference estimator by Arellano and Bond[9,10,11,12,13]. The first and second points pertain to the necessity of adopting the strategy, while the following three points highlight its advantages[14, 15].

Also, this approach is suitable as it effectively addresses the issue of a weak instrument in the context of difference-GMM when the dependent variable exhibits strong persistence across time. The issue of weak instrument, as identified by the difference-GMM estimate, leads to incorrect point estimates and hypothesis tests[16]. Past research has consistently supported Bond's claim that system GMM estimation consistently outperforms difference-GMM estimate in terms of accuracy and effectiveness[17, 18]. In addition, the verification of the effectiveness of system GMM was established in accordance with Roodman's suggestion that the quantity of instruments should not exceed the quantity of cross sections[19]. Therefore, the study employs the two-step technique in its specification due to its inherent ability to account for heteroskedasticity in errors, in contrast to the one-step approach which assumes homoskedasticity. The standard method of a

system GMM estimate is summarized by equation (3.7) in levels and equation (3.8) in first difference, in accordance with the baseline model.

$$y_{i,t} = \varphi_0 + \varphi_1 y_{i,t-\tau} + \sum_{h=1}^{n} \theta_h Z'_{h,i,t-\tau} + \pi_i + \varpi_t + e_{i,t} \tag{3.7}$$

$$y_{i,t} - y_{i,t-1} = \varphi_0 + \varphi_1 \left(y_{i,t-\tau} - y_{i,t-2\tau}\right) + \sum_{h=1}^{n} \theta_h \left(Z'_{h,i,t-\tau} - Z'_{h,i,t-2\tau}\right) + \left(\varpi_t - \varpi_{t-\tau}\right) + e_{i,t-\tau} \tag{3.8}$$

From the equations, tau is denoted by $\tau$, while the parameters are represented by $\varphi_0, \varphi_1, \theta_h$. The country-specific effects is denoted by $\pi_i$, whereas the time specific constant is $\varpi_t$. Also, the stochastic term is represented by $e_{i,t}$. Other variables, as previously noted, remain unchanged.

### 3.6 Construction of Composite Index of Inclusive Growth

This study employs the principal component analysis (PCA) to generate a composite measure of inclusive growth. In essence, PCA facilitates the simplification and interpretation of complex datasets, thereby aiding in the assessment and understanding of inclusive growth dynamics. The PCA results are presented in Table 3.6.1.

**Table 3.6.1:** Principal Component Analysis for Inclusive Growth

**Inclusive Growth Index**

| Principal Components | Component Matrix | | | Proportion | Cumulative Proportion | Eigen value |
|---|---|---|---|---|---|---|
| | Growth | Equality | Employment | | | |
| First PC | 0.6087 | -0.4706 | 0.6388 | 0.4475 | 0.4475 | 1.3426 |
| Second PC | 0.4386 | 0.8705 | 0.2233 | 0.3103 | 0.7579 | 0.9310 |
| Third PC | -0.6611 | 0.1443 | 0.7363 | 0.2421 | 1.0000 | 0.7264 |

**Note:** PC - principal component.
**Source:** Author's computation (2023).

Implications of Principal Component Analysis (PCA): It allows for the creation of a composite measure of inclusive growth by combining various metrics such as economic growth, income equality, and employment rates. By reducing the highly interconnected series of data into smaller, unrelated sets called "Principal Components," PCA preserves the original information while minimizing excessive correlations among the indicators of inclusive growth. This statistical technique enables the analysis of observed variables by condensing them into a smaller number of interpretable components, which capture the majority of variability present in the data.

The study applies the Kaiser and Jolliffe criterion to determine the common factors and calculates the eigenvalues for each component[21]. Having eigenvalues greater than 1 indicates that a significant amount of dispersion in the major component is preserved by each component. The results of the primary components are presented in Table 3.6.1. The inclusive growth index, derived from the three primary components of inclusive growth, accounts for approximately 44.75% of the overall variation in the distinct data, with an eigenvalue of 1.3426.

## Endnotes


1. O. Baruwa. *Institutional Quality, Financial Development and Inclusive Growth in Nigeria.* Award of Doctor of Philosophy (PhD) in Economics, Lead City University, Ibadan , Oyo State, Nigeria, 2022.

2. A. Campbell. *Investment in Human Capital for Inclusive Growth: Limitata or Illimitata Accessum to Sustainable Development.* Lead City Univsersity, Ibadan, 12th Inaugural Lecture, 2021

3. OECD. *The Economy of Wellbeing: Remarks by Angel Gurría,* 2019.https://www.oecd.org/about/secretary-general/the-economy-of-well-being-icelandseptember-2019.htm

4. A. Berg, & J.D Ostry, *Inequality and Unsustainable growth: Two Side of the Same Coin?* IMF Staff Discussion Note 11/08. Washington: International Monetary Fund, 2011

5. S. Bernard & N. Edward *Financial inclusion and inclusive growth in sub-Saharan Africa*, Cogent Economics & Finance, 2022. 10:1, 2058734, DOI:10.1080/23322039.2022.2058734

6. A. Khan, Khan, G., Safdar, S., Munir, S., & Andleeb, Z. *Measurement and Determinants of Inclusive Growth*: *A case study of Pakistan (1990-2012). The Pakistan Development Review*, *55*(4), 2016, 455–466. https://doi.org/10.30541/v55i4I-IIpp.455-466.

7. M.G Pedro *Aid Absorption and Spending in Africa: A Panel Cointegration Approach*Centre for Research in Economic Development and International Trade, University of Nottingham. CREDIT Research Paper. No. 10/06, 2019.

8. A. Levin, C. Lin & C. Chu *'Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties.'*Journal of Econometrics, 10(8), 2002, 1–24,

9. M. Arellano & S. Bond. *Some Tests of Specification for Panel Data: Monte Carlo Evidence and Application to Employment Equations*. Rev Econ Stud, 58, 1991, 277–297.

10. R. Blundell & S. Bond. *Initial Conditions and Moment Restrictions in Dynamic Panel Data Models*. Journal of Econometrics, 87, 1998, 115–143.

11. M. Arellano & O. Bover. *Another Look at the Instrumental Variable Estimation of Error Components Models*. Journal of Econometrics, 68(1), 1995, 29–52.

12. S. Bond, A. Hoeffler, & J. Tample. *GMM Estimation of Empirical Growth Models*. University of Oxford, Oxford, 2001.

13. V. S. Tchamyou. *Education, Lifelong Learning, Inequality and Financial Access: Evidence from African Countries*. Contemporary Social Science, 15(1), 2020, 7-25.

14. K. B. Ajide, & O. Y. Alimi. *The Conditioning Role of Institutions in Environment-Health Outcomes Nexus in Africa*. International Economic Journal, 34(4), 2020, 634-663.

15. O. Y. Alimi, & K. B. Ajide. *The Role of Institutions in Environment–Health Outcomes Nexus: Empirical Evidence from Sub-Saharan Africa*. Economic Change and Restructuring, 54(4), 2021, 1205-1252.

16. B. Heid, J. Langer & M. Larch. *Income and Democracy: Evidence from System GMM Estimates*. Economic Letters, 116, 2012, 166–169.

17. Y. Che, Y. Lu, Z. Tao, & P. Wang. *The Impact of Income on Democracy Revisited*. J Comp Econ, 41, 2013, 159–169.

18. D. Roodman. *How to do Xtabond2: An Introduction to Difference and System GMM in Stata*. Stata Journal, 9(1), 2009, 86–136.

19. A. Pan, D. Bosch, & H. Ma. *Assessing Water Poverty in China using Holistic and Dynamic Principal Component Analysis*. Social Indicators Research, 130(2), 2017, 537-561.

20. K. B. Ajide, O. Y. Alimi, S. A. Asongu, & I. D. Raheem. *The Role of Institutional Infrastructures in Financial Inclusion-Growth Relations: Evidence from SSA*. International Journal of Finance and Economics, 27(1), 2022, 175-191.

# Chapter Four

## Results and Discussion of Findings

The empirical analysis of this study is discussed in this chapter. The sub-sections are presented in three parts. The first section presents pre-estimation analysis; the second section discusses the empirical results according to the stated objectives, and the last section presents the discussion of findings. The discussion of findings started with descriptive analysis and summary statistics, which provided trend analysis of variables understudied. The chapter also provides some diagnostics test using some test statistics in order to ensure that the estimated results are reliable for meaningful inferences.

### 4.1 Preliminary Analysis

The preliminary analysis on descriptive statistics and trend analysis of the variables understudied for empirical analysis based on formulated hypotheses are presented in this section.

#### 4.1.1 Descriptive Statistics

The summary statistics of series for this study are presented in this section for all the variables adopted in the analysis that showcase the relationship between human capital development, labour productivity and inclusive growth in SSA countries under investigation. The descriptive characteristics operate around the maximum and minimum values, its mean, standard deviation and median across variables in the panel data.

**Table 4.1:** Summary of Descriptive Statistics

| Variable Measurement | Mean | Std Dev | Max | Min. | Kurtosis | Skewness | Obs. |
|---|---|---|---|---|---|---|---|
| ***Outcome Variables*** | | | | | | | |
| GDP per capita (annual growth) | 1.5349 | 4.331 | 18.015 | -22.383 | 9.261 | -1.295 | 354 |
| Income Equality | 0.5544 | 0.719 | 0.3524 | 0.079 | 2.348 | -0.124 | 354 |
| GDP per person employed | 12771.8 | 12599.7 | 51915.14 | 904.6 | 4.227 | 1.561 | 354 |
| Employment rate | 60.319 | 11.288 | 85.8660 | 36.850 | 2.426 | 0.343 | 354 |
| Inclusive growth index | 2.959 | 0.833 | 7.0000 | 1.500 | 4.659 | 0.666 | 354 |
| ***Main Explanatory Variables*** | | | | | | | |
| Gov exp on education | 3.8439 | 2.037 | 10.6786 | 0.018 | 4.085 | 0.992 | 354 |
| Gov exp on health | 5.1314 | 2.203 | 20.4134 | 2.321 | 16.113 | 2.702 | 354 |
| Primary school enrollment | 103.683 | 20.567 | 156.445 | 48.356 | 2.905 | 0.150 | 354 |
| Secondary school enrolment | 47.301 | 22.995 | 99.9039 | 9.632 | 2.383 | 0.576 | 354 |
| Life expectancy | 60.143 | 6.2073 | 76.5930 | 47.129 | 3.341 | 0.657 | 354 |
| Infant mortality rate | 54.928 | 23.161 | 118.000 | 12.200 | 2.552 | 0.171 | 354 |
| Gross fixed capital formation | 22.404 | 9.0225 | 60.0583 | 4.5625 | 5.237 | 1.213 | 354 |
| **Control Variables** | | | | | | | |
| Interest rate spread | 7.396 | 9.985 | 49.3425 | -3.602 | 7.718 | 1.859 | 354 |
| Domestic credit to private sector by banks | 22.198 | 20.493 | 104.894 | 0.004 | 6.780 | 2.003 | 354 |
| Inflation rate (consumer prices) | 8.3224 | 32.912 | 557.202 | -3.233 | 228.93 | 14.415 | 354 |
| Trade openness (% of GDP) | 63.806 | 23.738 | 129.779 | 16.352 | 2.858 | 0.723 | 354 |

**Source:** Author's computation (2023).

Table 4.1 provides the extent of variance explained by the models, the standard deviation reports the rate at which these variables deviate from their individual mean values, almost all of the variables have low deviation rate in varying magnitude from their mean values, as their standard deviation values are lower than average values.Specifically, in the case of Inclusive growth index which is the dependent variable, we found that its maximum value is 7.0000 whereas the minimum is as low as 1.5000 with a mean of 2.9598 which is closer to the minimum than the maximum. The claim is strongly confirmed by standard deviation since it is closer to the mean. This result substantially supports extant a priori expectations about poor economic structure in Sub Saharan African countries in which a significant number of people living in poverty. Meanwhile, three components of Inclusive growth index used in this study such as GDP per capita (annual growth), income equality and employment rate indicate the general standard of living in the region. As shown in Table 4.1, GDP per capita (annual growth), income equality and employment rate have their mean values at1.5349, 0.5544 and 60.3194 respectively. The values reveal the poor economic structure in Sub Saharan African countries. It is therefore presumed that a good economic structure creates equal opportunities for all across economic, social, and institutional dimensions.

The average value of GDP per person employed, life expectancy and infant mortality rate are 12771.87, 60.14263 and 54.9279 respectively. This shows that average yearly GDP per person employed (measured labor productivity) for the 32 SSA countries understudied relatively low indicating decreasing level of human capital to labor ratio. This indicates that growth rate in productivity is driven more by growth rate in human capital to labor ratio.

The average living age of the people in sub-Saharan Africa is 60.14years. Notwithstanding, the maximum for the region lies at 76.59 while the minimum is 47.13, This implies that longer life

expectancies often means a more diverse workforce and different age group bring various perspectives and skills to the workplace, fostering creativity, boosting productivity and driving economic growth. Furthermore, infant mortality under the age of 5 years (per 1,000 live births) has the moderate mean value of 54.93. This shows that the region has a relatively moderate rate of infant mortality.

Again, it is noted that the result for the specific input factor of human capital development such as government expenditure on education and government expenditure on health follow a similar trend as inclusive growth index with their mean also closer to the minimum. The mean values for government expenditure on education and government expenditure on health are 3.8439 and 5.1314 respectively which are closer to their minimum of 0.01775 and 2.32052 whereas their maximum value are 10.6786 and 20.4134. A quick look at the comparative value of its standard deviation (2.0368 and 2.2025) indicates that it is not too far from the mean. For these results, the relatively low value of the standard deviations for these series shows that there is only a small amount of deviation in the actual data from their mean value. Hence in relative terms, these variables are fundamentally low in their contributions to human capital development. Among the other specific factor outputs of human capital development, the mean value of primary school enrolment rate lies at 103.68. Similarly, the mean of secondary school enrolment is 47.30% thus indicating that a large percent of the people in the region are primary education certificate holders. However, the average the stock of physical capital measured by gross fixed capital formation (22.4036) is low compared to what is obtainable in other region.

For control variables, the mean values of interest rate spread, domestic credit to private sector by banks (% of GDP) and inflation rate measured by annual growth rate of consumer price index are 7.40%, 22.20% and 8.32% correspondingly. These control variables have their minimum

values to be -3.60%, 0.004% and -3.23% whereas the maximum values are 49.34%, 104.89% and 557.20% respectively for interest rate spread, domestic credit to private sector by banks (% of GDP) and inflation rate measured by annual growth rate of consumer price index. In addition, the table further depicts the trade openness proxy by total trade as ratio of GDP at an average rate of 63.81%.

Moreover, almost all the variables have asymmetrical distribution (skewed rightward), while GDP per capita (annual growth) and income equality are negatively skewed distributed (skewed leftward). The Kurtosis identified 3.0 suggesting the normal distribution. The Kurtosis of income equality, employment rate, primary school enrollment, secondary school enrolment, infant mortality rate and trade openness (% of GDP) are less than 3 which indicate variables are platykurtic in distribution implying that the variables has thinner tails and not normally distributed while GDP per capita (annual growth) GDP per person employed, inclusive growth index, government expenditure on education, government expenditure on health, life expectancy, gross fixed capital formation, interest rate spread, domestic credit to private sector by banks and inflation rate (consumer prices) are greater than 3 which indicate that the distribution of these variables are leptokurtic. That is, the distribution has heavier tails and normally distributed.

### 4.1.2 Trend Analysis

Before considering the empirical analysis relating to the relationship between human capital development, labour productivity and inclusive growth in SSA countries, we look at the growth record for GDP per capita and GDP per employed worker for selected SSA countries for the period 2000-2021.

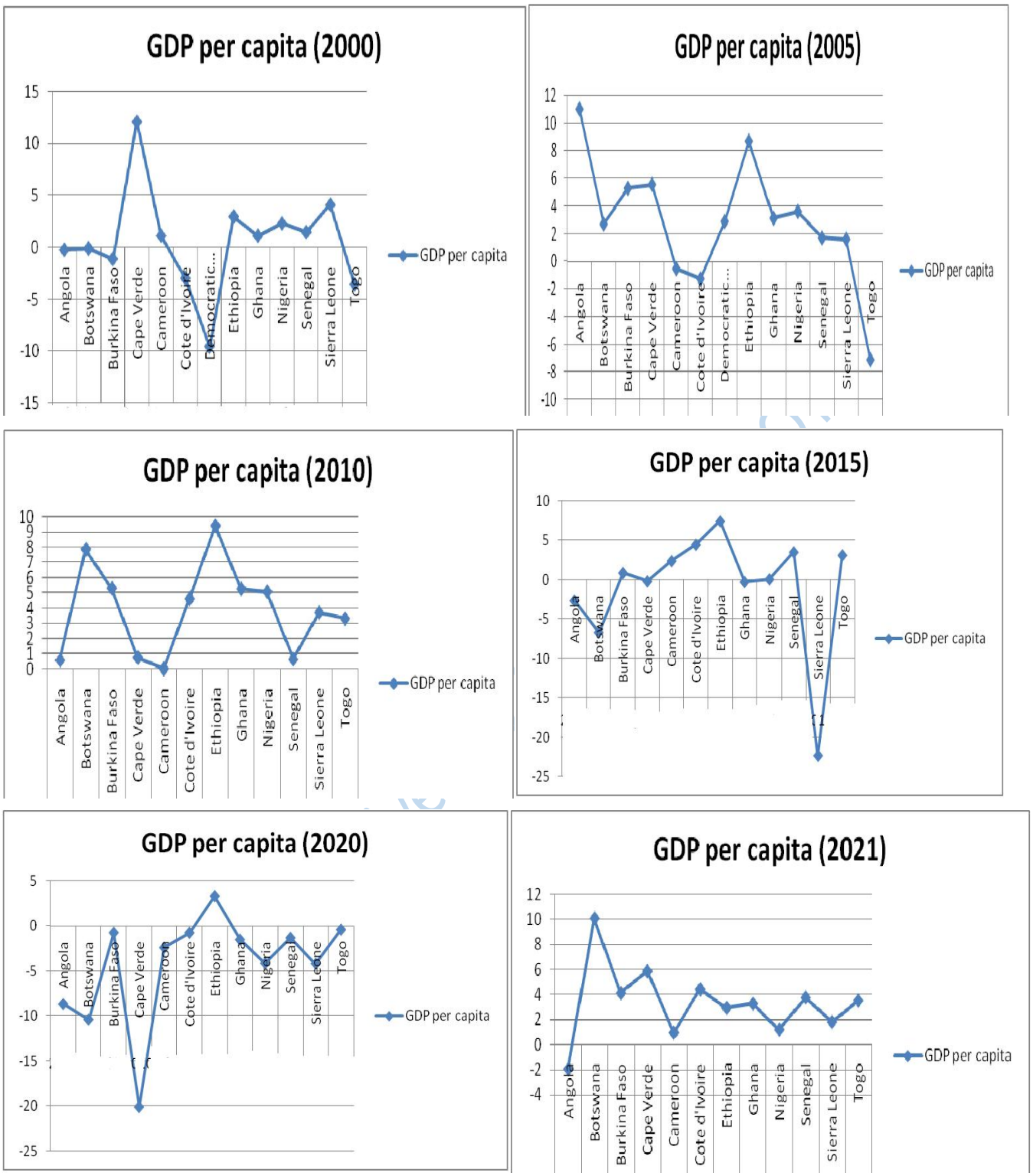



**Figure 4.1:** Annual growth of GDP per capita in selected sub-Saharan African nations, 2000-2021
**Source:** Researcher's computation

In Figure 4.1 the flowchart of annual growth of GDP revealing both relatively upward trend and downwards growth in all the selected SSA counties, Benin, Cape Verde, Cameroon, Ethiopia, Ghana, Nigeria, Senegal and Sierra Leone have had an upward trend in 2000 with a sharp decline in Cape Verde from 2001 till 2006 and subsequently a continual stable upward trend. The growth trend of GDP per capita in Angola, Botswana, Burkina Faso, Cote d'Ivoire and Democratic Republic of Congo have had down ward trend in 2000 to 2003 while Senegal, Sierra Leone and Togo have had relatively unstable upward trend.

Between 2010 and 2015, countries like Cameroun, Cote d'Ivoire, Democratic Republic of Congo, Ghana, Ethiopia, Sierra Leone, and Togo have relatively stable upward trend. The relative change (falling slightly) in GDP per capita 2015 to 2021 or Angola, Nigeria, Sierra Leone, Democratic Republic of Congo and Botswana is not a good indicator of inclusive growth since it is measured by economic growth which often not sufficient condition for a country's ability to improve the welfare of its population. However, there is a strong relationship between income (GDP) and output growth, countries with high economic growth (GDP) would often have a high output growth which is attributed to labour productivity. But there is a clear indication that there can be large differences in GDP per capita, even between countries with similar economic activities. In 2021, countries like Angola, Congo DR, Cameroun and Tanzania for example, have much lower GDP per capita than some of the countries with the middle income countries.

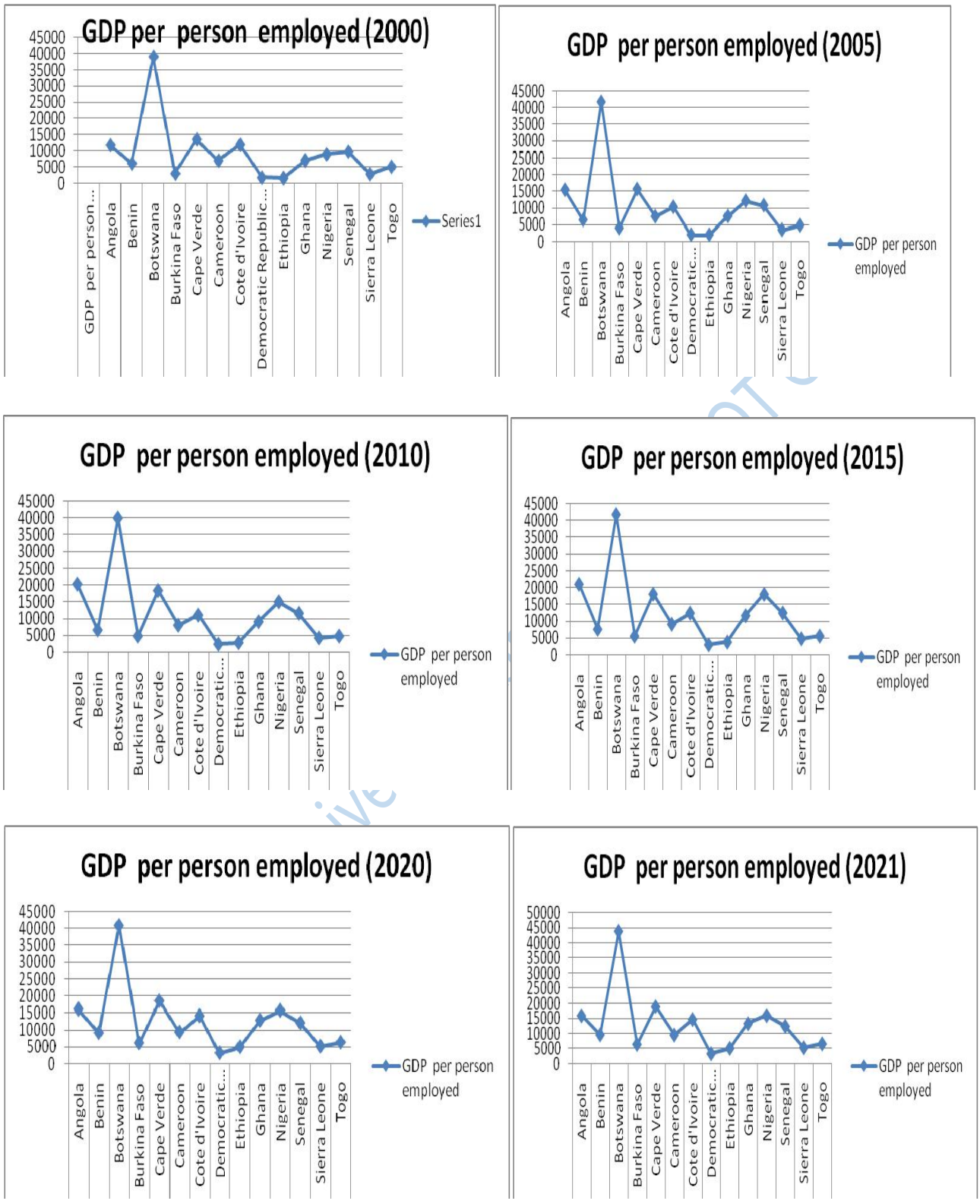



**Figure 4.2:** Annual growth GDP per employed person in some selected sub-Saharan African countries, 2000 to 2021

**Source:** Researcher's computation

GDP per employed person measured labor productivity - an important economic indicator that is closely linked to economic growth, competitive and living standards within an economy, It represents the total volume of output (measured in terms of GDP), produced per unit of labour (measured in terms of the number of employed persons) during a given period of time. From figure 4.2, Angola experienced a significant decline in GDP per person employed from 2015 to 2021, with an average growth rate of approximately 1.39% from 2000 to2021. This suggests economic challenges during the review period. This decline may be associated with factors such as fluctuations in oil prices (Angola is an oil-dependent economy) and the need for economic diversification away from oil, improving labor productivity, and enhancing the business environment to attract investment.

Botswana's GDP per person employed increased at a moderate rate, with average growth rate of approximately 1.08%, suggesting stable economic conditions. Botswana showed modest growth in GDP per person employed, reflecting stable economic conditions. The country's economic stability may be attributed to prudent resource management and economic diversification efforts. Cape Verde's GDP per person employed increased at a moderate rate, with an annual growth rate of approximately 4.42%, suggesting relatively stable economic conditions. Cote d'Ivoire showed positive growth in GDP per person employed, with Democratic Republic of Congo, Burkina Faso, Sierra Leone, and Togo experiencing the lowest growth rate.

## 4.2 Empirical Analysis

This section reports the empirical results in regards to the set objectives in the following four sub-sections.

### 4.2.1 Analysis of the First Hypothesis

This sub-section reports the empirical results relating to the effect of human capital development on labour productivity in SSA countries.

#### 4.2.1.1 Correlation Analysis and Scatter Plots (Input factor)

Table 4.2.1.1a below clearly shows degree of association exists between GDP per person employed (GDPPPE), Government expenditure on education (GEE), Government expenditure on health infrastructure (GEHI), Gross fixed capital formation (GFCF), Interest rate spread (IRS), Inflation Rate (INF) and Trade Openness (TO).

**Table 4.2.1.1a:** Correlation matrix

| Variable | *GDPPPE* | *GEE* | *GEHI* | *GFCF* | *IRS* | *INF* | *TO* |
|---|---|---|---|---|---|---|---|
| GDPPPE | 1 | | | | | | |
| GEE | 0.4585 | 1 | | | | | |
| GEHI | 0.0537 | 0.319 | 1 | | | | |
| GFCF | 0.2195 | 0.2015 | 0.0821 | 1 | | | |
| IRS | 0.0843 | 0.1945 | 0.0970 | 0.0798 | 1 | | |
| INF | 0.0405 | 0.0266 | 0.0979 | 0.0187 | 0.3497 | 1 | |
| TO | 0.6344 | 0.4031 | 0.0910 | 0.4600 | 0.1760 | 0.1017 | 1 |

**Note:** GDPPPE- GDP Per Person Employed; GEE- Government Expenditure on Education; GEHI- Government Expenditure on Health; GFCF- Gross Fixed Capital Formation; IRS-Interest Rate Spread; INF- Inflation Rate and TO- Trade Openness.

**Source:** Author's computation (2023).

Table 4.2.1.1a shows the relationship between the input factors of human capital development (such as government expenditure on education (GEE) and government expenditure on health infrastructure (GEHI)), GDP per person employed (measured labour productivity), and other control variables. The results show that government expenditure on education (GEE) has a positive correlation (0.458) with GDP per person employed. The relationship indicates higher government spending on education is associated with higher GDP per person employed, suggesting a positive impact on productivity.

The moderate positive relationship (0.2015) between government expenditure on education and gross fixed capital formation indicates an increased capital formation can contribute to education infrastructure and, in turn, education outcomes. In same way, government expenditure on health infrastructure has a positive correlation (0.0821) with gross fixed capital formation while other factors often influence healthcare infrastructure investments.

As for the other control variables, there is a moderate positive relationship (0.1945) between government expenditure on education and interest rate spread. The relationship suggests that interest rate dynamics can impact government spending on education. Meanwhile the positive correlation (0.0970) between interest rate spread and government expenditure on health infrastructure suggesting that interest rate dynamics do not strongly influence healthcare infrastructure investments. Besides, the moderate positive correlation (0.21950) between gross fixed capital formation and GDP per person employed indicates investments in fixed capital can positively impact productivity and employment. In addition, Inflation correlates positively with gross fixed capital formation while, a positive correlation (0.3497) between inflation and interest rate spread indicates that higher inflation is associated with wider interest rate spreads, which can affect financial markets and investment decisions.

On the relationship between trade openness and GDP per person employed, positive correlation (0.6344) exists between them. This means that higher trade openness is strongly associated with increased productivity as measured by GDPPPE. Trade openness and government expenditure on education also follows same pattern while their association suggests a strong positive correlation (0.403) which indicates trade openness is associated with higher education spending, likely due to increased revenues from international trade. A strong positive correlation (0.460) between trade openness and gross fixed capital formation indicates higher trade openness is associated with increased capital formation, reflecting the influence of international trade on investments. The relationships between the input factors of human capital development and labour productivity (measured by GDP per person employed (GDPPPE) is graphically represented via scatter graph in Figure 4.2.1.1 (a-f).

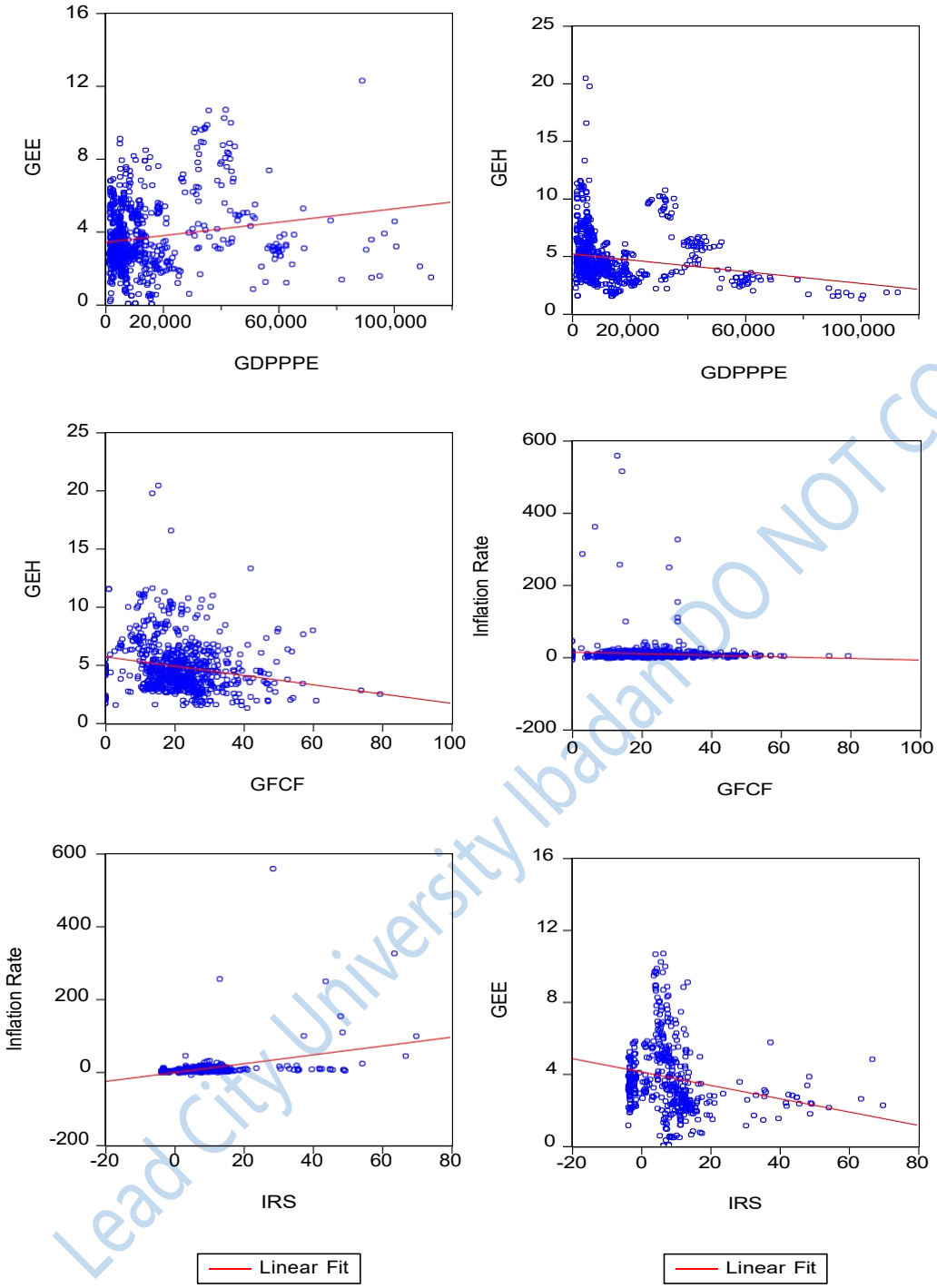





**Figure 4.2.1.1 (a-f):** Scatter graph of input factor of human capital development and labour productivity

**Source:** Author's computation (2023).

**Table 4.2.1.1b:** System GMM results on the effects of input factor of human capital development on labour productivity

| **Variables** | **Dependent Variable:** GDP per capita employed (GDPPPE) | | |
|---|---|---|---|
| | *1* | *2* | *3* |
| GDPPPE(-1) | 0.0096*** | 0.0694*** | 0.0732*** |
| | (0.000) | (0.000) | (0.000) |
| GEE | 0.0251* | | 0.0547* |
| | (0.057) | | (0.079) |
| GEH | | 0.3890 | 0.0655** |
| | | (0.647) | (0.030) |
| GFCF | -0.0576*** | -0.0645 | -0.136 |
| | (0.002) | (0.140) | (0.244) |
| IRS | -0.6351 | -0.3324 | -0.8508 |
| | (0.543) | (0.348) | (0.460) |
| INFR | -0.1394* | -0.2301** | -0.1960** |
| | (0.095) | (0.033) | (0.017) |
| TO | -0.0257 | -0.0236 | -0.1620** |
| | (0.756) | (0.642) | (0.002) |
| Constant | 0.0887* | 0.2866* | 0.0728 |
| | (0.051) | (0.096) | (0.112) |
| AR(1) | 0.045 | 0.199 | 0.230 |
| AR(2) | 0.772 | 0.993 | 0.348 |
| Hansen J-test | 0.380 | 0.353 | 0.493 |
| Observations | 527 | 708 | 707 |

**Note:** ***, ** and * indicate significance at 1%, 5% and 10% respectively

**Source:** Author's computation (2023).

Results from the system GMM shows that the first lagged of GDP per person employed (GDPPPE) have positive coefficients in all the three models for the effects of input factor of human capital development on labour productivity (measured by GDP per person employed). This implies that the previous year of GDP per person employed has a positive impact on the current year of GDP per person employed. However, the p-values of all the models are statistically significant at 1%. Government expenditure on education as an input indicator of human capital has effect on labour productivity. This implies that a percentage increase in government expenditure on education will increase labour productivity by 0.0251 percent in model one and 0.0547 percent model three. However, government expenditure on health positively influences labour productivity (measured by GDP per person employed) at 5 percent significance level in model three. This implies that a percentage increase in government expenditure on health will increase labour productivity by 0.0655 percent. This result is not far-fetched as a healthy worker tends to be productive at work.

On the contrary, gross fixed capital formation (GFCF) has a negative relationship with labour productivity in model one as it is seen that a percentage increase in gross fixed capital formation will reduce labour productivity by 0.0576 percent. Likewise, inflation exhibits negative relationship with labour productivity in all the models as it is also seen that a percentage increase in inflation will reduce labour productivity by 0.1394 percent in model one, 0.2301 percent in model two and 0.1960 percent in model three.

The study diagnostic test shown that p values of AR (1) revealed that there is presence of the serial correlation problem in model one while AR (2) indicated that there is no presence of the

second order serial correlation problem. The Hansen test reveals that the instrumental variables are valid.

### 4.2.1.2 Correlation Analysis and Scatter Plots (Output factor)

Table 4.2.1.2b below clearly shows degree of association between GDP per person employed (GDPPE), Gross primary school enrolment rate (PSE), Gross secondary school enrollment rate (SSE), Life expectancy (LE), Infant Mortality rate (IMR), Gross fixed capital formation (GFCF), Interest rate spread (IRS), Inflation Rate (INF) and Trade Openness (TO).

**Table 4.2.1.2b:** Correlation matrix

| **Variable** | ***GDPPE*** | ***PSE*** | ***SSE*** | ***LE*** | ***IM*** | ***GFCF*** | ***IRS*** | ***INF*** | ***TO*** |
|---|---|---|---|---|---|---|---|---|---|
| GDPPE | 1 | | | | | | | | |
| PSE | 0.0156 | 1 | | | | | | | |
| SSE | 0.7135 | 0.164 | 1 | | | | | | |
| LE | 0.4224 | 0.2056 | 0.5908 | 1 | | | | | |
| IM | 0.5593 | 0.1878 | 0.6637 | 0.850 | 1 | | | | |
| GFCF | 0.2100 | 0.0174 | 0.1099 | 0.2609 | 0.2649 | 1 | | | |
| IRS | 0.1020 | 0.3700 | 0.0135 | 0.1168 | 0.0847 | 0.2512 | 1 | | |
| INF | 0.0425 | 0.0618 | 0.0280 | 0.0313 | 0.0794 | 0.1884 | 0.095 | 1 | |
| TO | 0.6389 | 0.1305 | 0.5306 | 0.5229 | 0.4954 | 0.2813 | 0.4445 | 0.625 | 1 |

**Note:** GDPPPE- GDP Per Person Employed; PSE- Primary School Enrollment; SSE-Secondary School Enrolment; LE- Life Expectancy; IM-Infant Mortality Rate; GFCF- Gross Fixed Capital Formation; IRS-Interest Rate Spread; INF- Inflation Rate and TO- Trade Openness.

**Source:** Author's computation (2023).

The relationship between primary school enrolment and GDP per person employed is weak (0.0156) suggesting changes in primary school enrolment do not appear to have a substantial impact on productivity as measured by GDPPPE. Secondary school enrolment, life expectancy,

and lower infant mortality rates are strongly associated with increased productivity. While primary school enrolment has a weaker impact on productivity, primary school enrolment is correlated with gross fixed capital formation. There is a strong positive correlation (0.7135) between secondary school enrolment and GDP per person employed which suggests higher secondary school enrolment is strongly associated with increased productivity as measured by GDPPPE.

The relationship between secondary school enrolment and gross fixed capital formation suggests positive correlation (0.1099) while there is some connection, fixed capital formation does impact on secondary school enrolment. An increase in capital formation also increase education infrastructure. The positive correlation (0.2100) between gross fixed capital formation and GDP per person employed suggests that an increase in capital formation is associated with higher productivity as measured by GDPPPE. There is also a moderate positive correlation (0.2649) between gross fixed capital formation and infant mortality. Higher capital formation is associated with lower infant mortality rates.

Notably, GFCF shows moderate positive correlations with GDP per person employed, life expectancy, and lower infant mortality rates, indicating its potential influence on these outcomes. However, its relationship with primary and secondary school enrolment is weaker, suggesting that other factors may play a more significant role in these education indicators. The graphical presentation of the correlations is shown in Figure 4.2.1.2 (a-g).

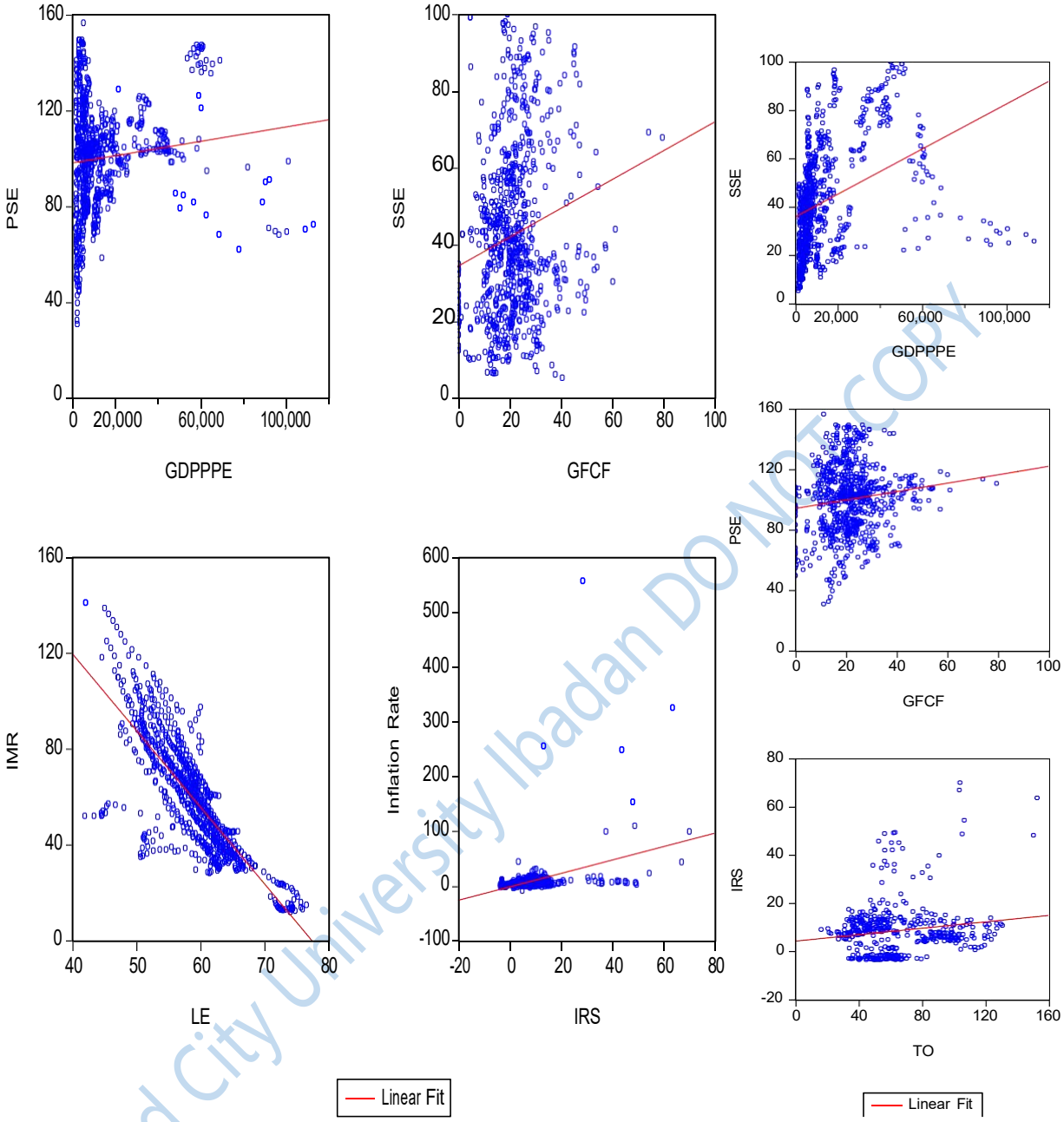





**Figure 4.2.1.2 (a-g):** Scatter graph of output factor of human capital development and labour productivity

**Source:** Author's computation (2023).

**Table 4.2.1.2b:** System GMM results on the Effects of Output Factor of Human Capital Development on Labour Productivity

| Variables | **Dependent Variable:** GDP per capita employed (GDPPPE) | | | | |
|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** |
| GDPPPE(-1) | 0.4944 | 0.9932*** | 0.9781*** | 0.9791*** | 0.851** |
| | (0.110) | (0.000) | (0.000) | (0.000) | (0.020) |
| PSE | -772.88** | | | | 0.465** |
| | (0.014) | | | | (0.037) |
| SSE | | -0.750 | | | 0.865 |
| | | (0.239) | | | (0.271) |
| LE | | | 0.493 | | 0.730 |
| | | | (0.263) | | (0.419) |
| IMR | | | | -1.9107 | 0.567 |
| | | | | (0.202) | (0.302) |
| GFCF | -0.657*** | -34.201** | -28.024 | -27.140** | 90.275** |
| | (0.009) | (0.049) | (0.516) | (0.041) | (0.028) |
| IRS | 0.85 | -14.163 | -32.676 | -39.135* | -411.13 |
| | (0.170) | (0.255) | (0.235) | (0.059) | (0.357) |
| INFR | -22.744** | -3.1817 | -6.8796** | -8.2143** | -20.371* |
| | (0.029) | (0.120) | (0.010) | (0.043) | (0.082) |
| TO | 341.86 | -4.3239 | -9.9566 | -13.054 | -147.55 |
| | (0.150) | (0.830) | (0.685) | (0.635) | (0.395) |
| Constant | 65028.04 | 2307.70 | 1373.65 | 2733.0 | -53356.6 |
| | (0.191) | (0.300) | (0.784) | (0.479) | (0.938) |
| AR(1) | 0.023 | 0.016 | 0.037 | 0.051 | 0.010 |
| AR(2) | 0.689 | 0.781 | 0.901 | 0.990 | 0.891 |
| Hansen J-test | 0.523 | 0.597 | 0.931 | 0.439 | 0.595 |
| Observations | 710 | 715 | 715 | 729 | 710 |

**Note:** ***, ** and * indicate significance at 1%, 5% and 10% respectively.

**Source:** Author's computation (2023).



Table 4.2.1.2b depicts the impact of output factors of human capital development on labour productivity (measured by GDP per person employed). According to the results, the first lagged

of GDP per person employed (GDPPPE) have a positive coefficients in all the models indicating that the previous year of GDP per person employed has a positive impact on the current year of GDP per person employed. However, all the p-values except that of model one are statistically significant at 1% and 5%. The results further show that the combined impact of output factors of human capital development on GDP per person employed (as shown in model 5) indicates that all output factors coefficients are positives but only primary school enrolment (PSE) is statistically significant. This implies that among various output of human capital development, primary school enrolment is a driver to productivity. Specifically, there is a negative effect of primary school enrollment (PSE) on GDPPPE. Thus, primary school enrollment (PSE) has a negative coefficient and is statistically significant at the 5% significance level concerning GDPPPE. This suggests that an increase in primary school enrollment is associated with a decrease in GDPPPE.

In same manner, secondary school enrollment (SSE) also exhibits a negative coefficient but is not statistically significant. This suggests that there may not be a significant relationship between secondary school enrollment and GDPPPE in model 2. Likewise, life expectancy (LE) has a positive coefficient but is not statistically significant in relation to GDPPPE. This implies that life expectancy may not be a significant predictor of GDPPPE in model 3. The infant mortality rate (IMR) exhibits negative coefficient but is not statistically significant in relation to GDPPPE. Generally, output factors of human capital development in SSA countries may not produce higher return where the available stock of capital allows labour to put their best use the skills they acquire.

As for our control variables, except gross fixed capital formation (GFCF) all control variables have negative coefficients but not statistically significant in relation to GDPPPE (model 5). We

find that inflation has deleterious effect on GDP per person employed (column 1). In testing for the validity of the instrument, the *p* values of AR (2) revealed that there is no presence of the second-order serial correlation problem and our models pass the Hansen test of valid overidentifying restrictions.

### 4.2.2 Analysis of the Second Hypothesis

This sub-section reports the empirical results relating to the effect of human capital development on inclusive growth in SSA countries.

#### 4.2.2.1 Correlation Analysis

In order to examine the degree of relationship between different pairs of variables of interest in this study, correlation analyses are carried out. According to various scholars[1], a correlation coefficient of about 0.95 and above portends the danger of multicollinearity in the estimated model. The results of the correlation analyses presented under different tables show that correlation coefficients between different pairs of variables are low and below the acceptable threshold. This indicated that there is no possibility of multicollinearity in the model to be estimated.

**Table 4.2.2.1:** Correlation Matrix (input factor)

| Variable | *INCG* | *GDPPCG* | *EQ* | *ER* | *GEE* | *GEHI* | *GFCF* | *IRS* | *INF* | *TO* |
|---|---|---|---|---|---|---|---|---|---|---|
| INCG | 1 | | | | | | | | | |
| GDPPCG | 0.817 | 1 | | | | | | | | |
| EQ | 0.098 | 0.019 | 1 | | | | | | | |
| ER | 0.136 | 0.006 | 0.038 | 1 | | | | | | |
| GEE | 0.075 | 0.034 | 0.251 | 0.204 | 1 | | | | | |
| GEHI | 0.017 | 0.035 | 0.125 | 0.215 | 0.320 | 1 | | | | |
| GFCF | 0.064 | 0.084 | 0.141 | 0.017 | 0.202 | 0.082 | 1 | | | |
| IRS | 0.065 | 0.039 | 0.063 | 0.267 | 0.195 | 0.097 | 0.079 | 1 | | |
| INF | 0.052 | 0.138 | 0.015 | 0.081 | 0.027 | 0.097 | 0.019 | 0.349 | 1 | |
| TO | 0.066 | 0.079 | 0.119 | 0.225 | 0.404 | 0.091 | 0.461 | 0.176 | 0.102 | 1 |

**Note:** INCG-Inclusive Growth Index; GDPPCG- GDP Per Capita Growth; EQ-Income Equality; ER – Employment Rate; GEE- Government Expenditure on Education; GEHI- Government Expenditure on Health; GFCF- Gross Fixed Capital Formation; IRS-Interest Rate Spread; INF-Inflation Rate and TO- Trade Openness

**Source:** Author's computation (2023).

The correlation matrix in table 4.2.2.1 provides the strength and direction of the relationships between different pairs of variables of interest. According to results, all the input factors of human capital development have positive relationship with inclusive growth components. Specifically, there is a strong positive correlation between GDP per capita growth (GDPPCG) and inclusive growth index (INCG) at 0.817 which suggests a robust relationship between GDP per capita growth and the Inclusive. This means that as GDP per capita grows, there tends to be an increase in inclusive growth. Inclusive growth indicates that the benefits of economic growth are shared more equitably among the population, including marginalized groups.

As for the income equality (one of component of inclusive growth index), there is a positive correlation between income equality (INEQ) and inclusive growth Index (INCG) (0.0978). This

implies that while there is some connection between income equality and inclusive growth, it is not a strong one. This suggests that other factors beyond income equality might significantly influence inclusive growth.

It also shows that, a very weak positive correlation between income equality (INEQ) and GDPPC Growth (GDPPCG) (0.0193) is noted suggesting that there is almost no meaningful relationship between income equality and GDP per capita growth. This indicates that changes in income equality have little impact on the rate of GDP per capita growth, or there may be other dominant factors at play. A positive correlation between employment rate (ER) and inclusive growth index (INCG) at 0.136 suggests a weak relationship. This means that employment rates are associated with slightly better inclusive growth, but again, other factors likely play a more substantial role in achieving inclusive growth. The extremely weak positive correlation (0.006) between the employment rate and GDP per capita growth indicates almost no significant relationship between these two variables. This suggests that changes in employment rates don't strongly influence the rate of GDP per capita growth.

Further, the relatively weak positive correlation between employment Rate (ER) and income equality (0.038) suggests a modest connection between the employment rate and income equality. This could mean that improving employment rates might have a slight positive impact on income equality, but other factors are likely more influential in addressing income inequality. The positive correlation between government expenditure on education (GEE) and inclusive growth (INCG) (0.075) suggests a weak relationship. This implies that an increase in education spending may have a slightly positive impact on inclusive growth, as education can be a driver of economic and social development.

More so, the positive correlation (0.034) between government expenditure on education and GDP per capita growth is weak, indicating that these two variables are not strongly related. Theoretically, education spending often contributes to economic growth, but it appears to be a minor factor in this case. The positive correlation (0.251) between government expenditure on education and income equality suggests a moderate relationship. This suggests that, higher education spending may contribute to reducing income inequality by improving access to quality education. The results also show that the positive correlation of 0.204 indicates a moderate relationship between government expenditure on education and the employment rate. This implies that increased education spending may lead to improved employment opportunities through a more skilled workforce.

There is a very weak positive correlation between government expenditure on health infrastructure (GEHI) and inclusive growth index (INCG) (0.017) which suggests almost no meaningful relationship between health infrastructure spending and inclusive growth. The positive correlation (0.035) between health infrastructure spending and GDP per capita growth is weak, indicating a limited connection. Invariably, better healthcare infrastructure can contribute to a healthier and more productive population, but it appears to be a minor factor in this study. The moderate positive correlation value of 0.125 suggests a moderate relationship between health infrastructure spending and income equality. Improved healthcare access and quality can contribute to reducing health-related income disparities. The positive correlation value of 0.215 indicates a moderate relationship between health infrastructure spending and the employment rate. Access to good healthcare can contribute to a healthier workforce, potentially increasing employment rates. Gross fixed capital formation (GFCF) shows weak to moderate correlations with the different indicators. The correlations vary depending on the specific indicator, but none

of them are very strong. GFCF is a measure of investment in physical assets like machinery and infrastructure, and its impact on economic and social indicators may depend on various other factors.

As regards to interest rate spread (IRS) and Inclusive Growth (INCG) at 0.065 suggesting a weak relationship. A higher interest rate spread might indicate a more profitable banking sector, but its direct impact on inclusive growth is relatively minor. The positive correlation (0.039) between interest rate spread and GDP per capita growth is weak, indicating that these two variables are not strongly related. Meanwhile, interest rate spread is more closely associated with the banking sector's profitability than with overall economic growth. Also, the positive correlation value of 0.063 suggests a weak relationship between interest rate spread and income equality. It implies that changes in interest rate spread have a minor influence on income inequality, with other factors likely playing a more significant role. The positive correlation value of 0.267 indicates a moderate relationship between interest rate spread and the employment rate. A higher interest rate spread might be associated with more favorable conditions for lending and investment, which could positively impact employment rates. Likewise, a positive correlation value of 0.195 suggests a moderate relationship between interest rate spread and government expenditure on education. It could indicate that a more profitable banking sector (reflected in a higher interest rate spread) might indirectly support government spending on education through increased tax revenue or economic activity. Further, a positive relationship between interest rate spread and government expenditure on health infrastructure (0.097) indicates a weak relationship. The impact of interest rate spread on healthcare spending is relatively minor, with other factors likely being more influential. The positive correlation between interest rate spread and gross fixed capital formation (0.079) suggests a weak relationship. GFCF measures investment in physical

assets, and while a favorable interest rate spread can impact borrowing costs for investments, it is not a strong driver on its own.

On other control variables, there positive correlation value of 0.052 between inflation rate and inclusive growth. This suggests a weak relationship, implying that other factors play a more significant role in inclusive growth. Also, the positive correlation value 0.138 between inflation rate and GDP per capita growth indicates a weak relationship. Higher inflation may not necessarily lead to higher GDP per capita, as inflation can have complex effects on economic performance. There is also very weak positive correlation (0.015) between inflation rate and income equality. This indicates that Inflation has a minor direct impact on income inequality, with other factors being more influential. The positive correlation (0.081) indicates a weak relationship between inflation rate and the employment rate. Inflation can influence employment dynamics, but this correlation is relatively low, suggesting other factors are more important.

The correlation between inflation rate and government expenditure on education at 0.027 suggests a weak relationship. Inflation typically affects the cost of education, but it appears to have a minor impact on education spending in this case. In same way, there is positive correlation (0.097) between inflation rate and government expenditure on health indicates a weak relationship. Inflation often affects healthcare costs, but other factors likely have a stronger influence on healthcare spending. A very weak positive correlation (0.019) between inflation rate and gross fixed capital formation suggest an almost negligible relationship. This implies that inflation is not a significant driver of capital formation, which involves investments in physical assets. Between inflation rate and interest rate spread, there is a relatively strong positive correlation (0.349). Inflation can impact interest rates, and a higher inflation rate may lead to a wider interest rate spread, which can affect borrowing costs and lending profitability.

In addition, trade openness has a positive but a weak correlation (0.066) with inclusive growth. While trade openness can promote economic activity, this correlation indicates that it is not a strong driver of inclusive growth on its own. While the weak positive correlation (0.079) between trade openness and GDP per capita growth indicates trade can contribute to economic growth, but this correlation suggests that other factors also play a role. The positive correlation value of 0.119 suggests a moderate relationship between trade openness and income equality. An increase in trade openness might influence income distribution to some extent, with other factors also affecting income equality.

The positive correlation (0.225) between trade openness and the employment rate indicates a moderate relationship. Trade can create job opportunities, and this correlation suggests that it has a more substantial impact on employment compared to some other indicators. Also, the strong positive correlation value of 0.404 suggests a robust relationship between trade openness and government expenditure on education. It implies that more open trade policies might lead to increased government spending on education, possibly due to higher revenue generation from international trade. While, there is weak positive correlation (0.091) between trade openness and government expenditure on health. Trade openness also has a strong positive correlation (0.461) with gross fixed capital formation suggesting a robust relationship. This correlation indicates trade can lead to increased investments in physical assets. A positive correlation (0.176) between trade openness and interest rate spread indicates trade can affect a country's financial markets and potentially influence interest rates, but other factors also play a role.

A pictorial view of the correlation coefficients of different pairs of variables of interest is depicted in the scatter graph in Figure 4.2.2.1 (a-d) and (e-h). The scatter charts show a graphical

outlook of the correlation coefficients of input factors of human capital development against inclusive growth, income equality etc.

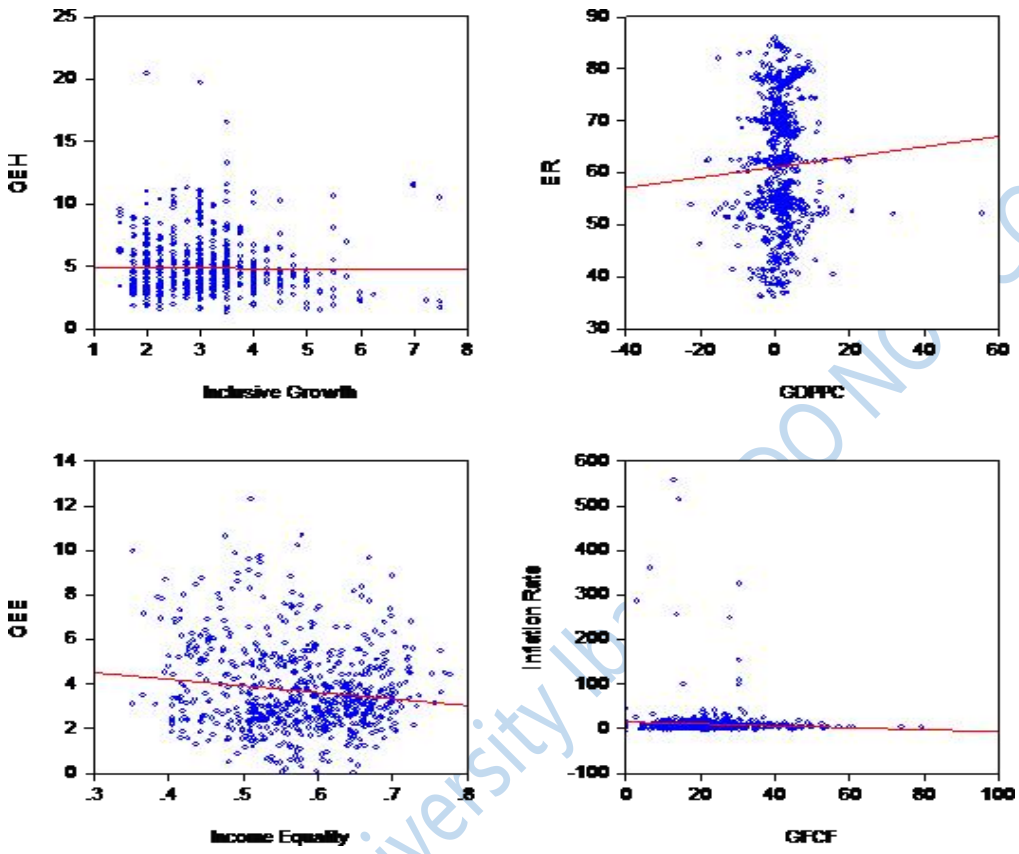



**Figure 4.2.2.1 (a-d):** Scatter graph of inclusive growth components and input factors of human capital development

**Source:** Author's computation (2023).

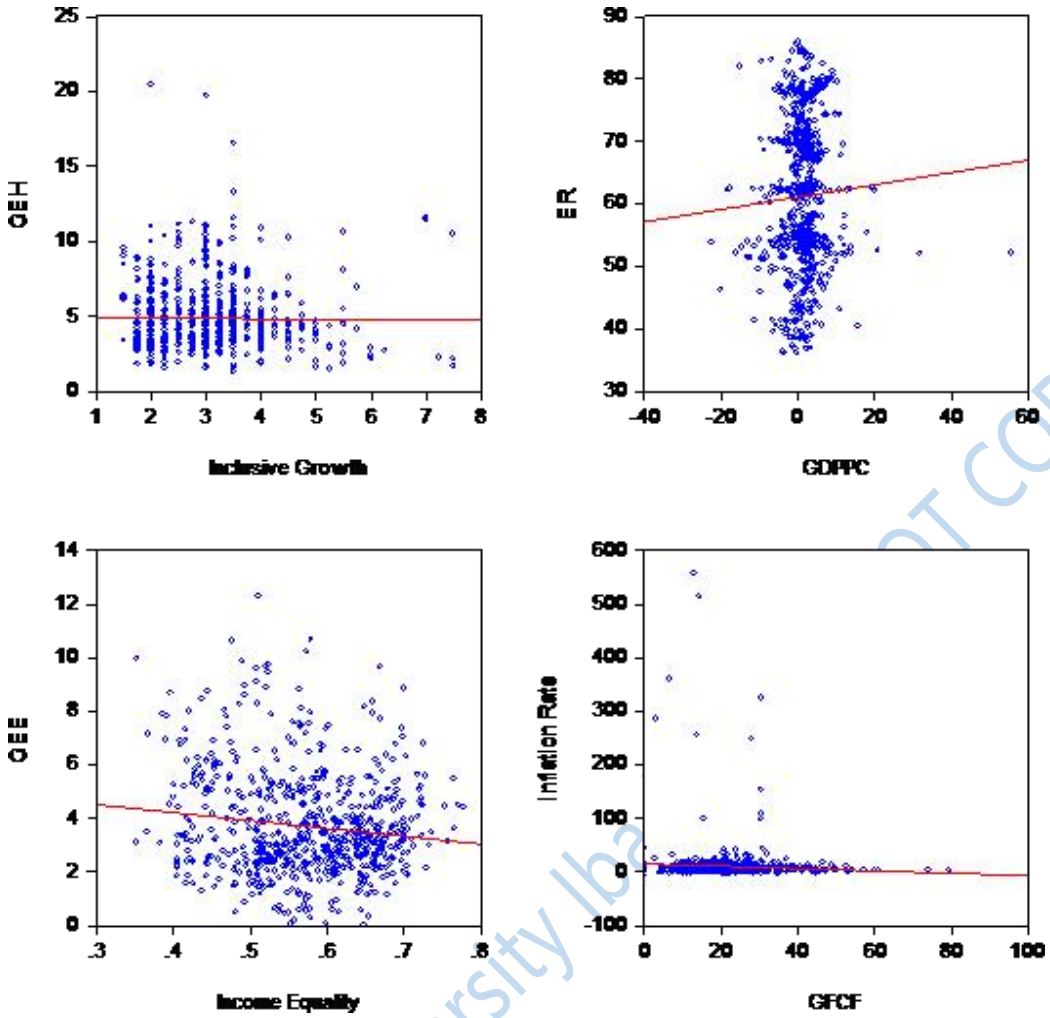



**Figure 4.2.2.1(e-h):** Scatter graph of inclusive growth components and input factors of human capital development

**Source:** Author's computation (2023).



### 4.2.2.2 System GMM results on the Effect of Input Factors of Human Capital Development on Inclusive Growth

For our second hypothesis, Table 4.2.2.2 shows the result of system GMM estimation model on the effect of input factors related to human capital (such as government expenditure on education and health) on inclusive growth and its components. On the first lagged inclusive growth and its components, GDP per capita have a negative coefficient of approximately -0.491. This suggests

that the previous year's GDP per capita has a negative impact on the current year's GDP per capita growth. However, with p-value of 0.0529 indicating that this relationship is statistically significant at the 10% level. The lagged one of employment rate has a positive coefficient and is highly statistically significant at the 1% significance level. This suggests that the previous year's employment rate strongly influences the current employment rate. The results also show that the lag one of income equality and inclusive growth index have no significant impact on the current level.

**Table 4.2.2.2:** System GMM results on the Effects of Input factor of Human Capital Development on the Inclusive Growth

| **Variables** | **Dependent Variable:** Inclusive growth | | | |
|---|---|---|---|---|
| | **GDPG per capita(GDPPCG)** | **Income Equality(EQU)** | **Employment Rate(EMP)** | **Inclusive Growth Index (INCG)** |
| GDPPCG(-1) | -0.491043*<br>(0.053) | | | |
| EQU(-1) | | 4.647280<br>(0.805) | | |
| EMP (-1) | | | 1.099134***<br>(0.000) | |
| INCG(-1) | | | | 0.281337<br>(0.729) |
| GEE | 1.773547**<br>(0.025) | 0.039861*<br>(0.086) | -0.264589***<br>(0.004) | 0.245451<br>(0.618) |
| GEH | -1.420373**<br>(0.013) | -0.030997*<br>(0.086) | -0.067740*<br>(0.0573) | -0.032112*<br>(0.0903) |
| GFCF | -0.092456*<br>(0.075) | -0.003764<br>(0.188) | -0.044976*<br>(0.062) | 0.021448**<br>(0.017) |
| IRS | -0.232806<br>(0.394) | -0.032144<br>(0.169) | 0.038785<br>(0.688) | -0.005673<br>(0.041) |
| INFR | -0.076014<br>(0.036) | -0.004616<br>(0.714) | 0.006815*<br>(0.077) | 0.004407<br>(0.781) |
| TO | 0.020552<br>(0.876) | -0.019142<br>(0.779) | 0.028555***<br>(0.004) | 0.047334<br>(0.165) |

| | | | | |
|---|---|---|---|---|
| Constant | 6.635671<br>(0.568) | 4.813013<br>(0.716) | -6.019604<br>(0.756) | -2.602986<br>(0.714) |
| AR(1) | 0.027 | 0.004 | 0.042 | 0.0061 |
| AR(2) | 0.375 | 0.259 | 0.517 | 0.255 |
| Hansen J-test | 0.4279 | 0.407 | 0.260 | 0.372 |
| Observations | 700 | 700 | 700 | 700 |

**Note:** ***, ** and * indicate significance at 1%, 5% and 10% respectively.

**Source:** Author's computation (2023).

The coefficients of government expenditure on education are positive and significant in GDPG per capita and income equality. This implies that government expenditure on education positively and significantly influences GDPG per capita and income equality. In magnitude term, a 1% change in government spending on education affect GDPG per capita and income equality by 1.774 and 0.0398 respectively. The coefficients of government expenditure on education and health negatively and significantly affect employment rate. This implies that 1% increase in government expenditure on education and government expenditure on health is associated with a 0.27and 0.068 decrease in employment rate respectively. The parameter of government expenditure on health in GDPG per capita and income equality exhibit negative effect and statistically significant at the 5% and 10% level. This implies that 1% change in government expenditure on health negatively affect GDPG per capita and income equality by 1.42 and 0.031 respectively. In addition, the parameter of government expenditure on health in inclusive growth index is negative and significance at 10% level. This suggests that a 1% increase in government expenditure on health is associated with decrease of 0.032 in inclusive growth indicating that government health expenditure adversely impact inclusive growth in SSA. Thus, inadequate public health spending is significantly related with the region's low output growth, high unemployment rate and rising inequality.

Gross fixed capital formation has a negative coefficient in GDPG per capita, income equality and employment rate. However, the p-value of 0.0748 and 0.062 are statistically significant at the conventional 10% level in GDPG per capita and employment rate respectively. This indicates that an increase in investment in fixed capital associated with a decrease in GDP per capita growth and employment rate by 0.093 and 0.045 respectively. While gross fixed capital formation has a positive coefficient (0.02) in inclusive growth at 5% significance level. Overall, the results show that governments of SSA countries have not invested significantly enough in the health sector for their citizens to benefit from.

For control variables, inflation and trade openness has positive coefficient and significant effect on employment. This suggests that higher inflation could positively impact employment while higher trade openness is associated with a higher employment rate. Post-diagnostic results show that there is no evidence of serial correlation in the estimated models. In confirming the consistency of the GMM estimates, the Hansen test reveals that the instrumental variables are valid

#### 4.2.2.3 Correlation Analysis and Scatter Plots (Output factor)

Table 4.2.2.3 depicts the degree of association exists between inclusive growth index and the variables of output factor of human capital development as well as other control variables. The variables consider include gross primary school enrolment rate (PSE),gross secondary school enrollment rate (SSE), life expectancy (LE), infant mortality rate (IM), gross fixed capital formation (GFCF), interest rate spread (IRS), inflation Rate (INF) and trade openness (TO).

**Table 4.2.2.3:** Correlation matrix

| Variable | *INCG* | *GDPPCG* | *EQ* | *ER* | PSESSELEIM | *GFCF* | *IRS* | *INF* | *TO* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| INCG | 1 | | | | | | | | | | |
| GDPPCG | 0.819 | 1 | | | | | | | | | |
| EQ | 0.091 | 0.026 | 1 | | | | | | | | |
| ER | 0.129 | 0.001 | 0.043 | 1 | | | | | | | |
| PSE | 0.119 | 0.075 | 0.188 | 0.025 | 1 | | | | | | |
| SSE | 0.074 | 0.065 | 0.200 | 0.382 | 0.155 | 1 | | | | | |
| LE | 0.076 | 0.108 | 0.141 | 0.222 | 0.154 | 0.583 | 1 | | | | |
| IM | 0.125 | 0.099 | 0.217 | 0.321 | 0.196 | 0.684 | 0.825 | 1 | | | |
| GFCF | 0.051 | 0.079 | 0.145 | 0.015 | 0.018 | 0.094 | 0.213 | 0.211 | 1 | | |
| IRS | 0.062 | 0.041 | 0.063 | 0.278 | 0.227 | 0.135 | 0.031 | 0.108 | 0.076 | 1 | |
| INF | 0.054 | 0.139 | 0.015 | 0.082 | 0.071 | 0.017 | 0.113 | 0.099 | 0.021 | -0. 020 | 1 |
| TO | 0.062 | 0.078 | 0.117 | 0.222 | 0.068 | 0.435 | 0.358 | -0.346 | 0.453 | 0.346 | 0.054 | 1 |

**Note:** INCG-Inclusive Growth Index; GDPPCG- GDP Per Capita Growth; EQ-Income Equality; ER – Employment Rate; PSE- Primary School Enrollment; SSE-Secondary School Enrolment; LE- Life Expectancy; IM-Infant Mortality Rate; GFCF- Gross Fixed Capital Formation; IRS-Interest Rate Spread; INF- Inflation Rate and TO- Trade Openness.

**Source:** Author's computation (2023).



In relations to the output factor of human capital development and inclusive growth, primary school enrolment (PSE) and secondary school enrolment (SSE) have varying degrees of relationship (weak to strong) with inclusive growth, GDP per capita growth, income equality and employment rate. However, these output factors of human capita development (primary school enrolment (PSE) and secondary school enrolment) appears to have a significant impact on these indicators suggesting a clear connection, while weaker correlations indicate that other factors may play more substantial roles in influencing these indicators.

On other output factors of human capital development, life expectancy (LE) has a weak relationship (0.0762) with inclusive growth. While other factors likely play a more significant role in influencing life expectancy. A positive correlation (0.1084) indicates a weak relationship between life expectancy and GDP per capita growth. While economic growth can contribute to improvements in healthcare and life expectancy. Also, a positive correlation (0.14056) suggests a

moderate relationship between life expectancy and income equality. Higher income equality may have a positive impact on life expectancy, as it can lead to non disparities in access to healthcare and living conditions. The positive correlation (0.22206) indicates a moderate relationship between life expectancy and the employment rate. Higher employment rates may contribute to improved overall well-being and access to healthcare, positively influencing life expectancy. The positive correlation (0.1543) suggests a moderate relationship between life expectancy and primary school enrolment. Improved education, represented by higher primary school enrolment, can lead to better health outcomes and a longer life expectancy. Likewise, a strong positive correlation (0.5832) between life expectancy and secondary school enrolment indicates higher secondary school enrolment is associated with better healthcare knowledge and access to healthcare, positively impacting life expectancy.

Infant mortality has a positive correlation (0.1254) with inclusive growth, while inclusive growth may have some influence on infant mortality, other factors, such as healthcare infrastructure, play a more significant role. The positive correlation (0.0991) indicates a weak relationship between infant mortality and GDP per capita growth. Improvements in economic conditions can contribute to better healthcare, but other healthcare-related factors are likely more important in reducing infant mortality. In other way, a positive correlation at 0.2167 suggests a moderate relationship between infant mortality and income equality. Higher income equality may be associated with lower infant mortality rates due to access to healthcare and living conditions. Also, a strong positive correlation at 0.8246 indicates a robust relationship between infant mortality and life expectancy. Lower infant mortality rates are typically associated with longer life expectancies, as both indicators reflect the overall health and healthcare quality of a population

The table depicts that there is a very strong positive correlation (0.8196) between inclusive growth and GDP per capita growth. This indicates that as a country achieves more inclusive growth, it tends to see higher GDP per capita growth, suggesting that economic benefits are broadly shared among the population. The positive correlation (0.09109) between income equality and inclusive growth is a weak relationship while there is some connection, implying that other factors beyond income equality contribute to inclusive growth. Similarly, a very weak positive correlation (0.02559) between income equality and GDP per capita growth exist. This suggests that changes in income equality appear to have little impact on the rate of GDP per capita growth.

On employment rate and inclusive growth, there is a positive correlation (0.12854) between the employment rate and inclusive growth. This indicates higher employment rates are associated with slightly better inclusive growth, suggesting that employment plays a role in achieving more equitable economic development. An extremely weak positive correlation (0.0008) between employment rate and GDP per capita growth exist. This suggests that employment rates appear to have little direct impact on GDP per capita growth in this study. The positive correlation value of 0.0428 suggests a weak relationship between the employment rate and income equality. Employment rates may contribute slightly to income equality, but other factors are likely more influential.

The positive correlation of 0.0514 suggests a weak relationship between gross fixed capital formation and inclusive growth. While a positive correlation (0.07966) relationship between gross fixed capital formation and GDP per capita growth also indicates a weak relationship. Thus, investments in fixed capital can contribute to economic growth; this correlation suggests that other factors also play a role. More so, gross fixed capital formation has a positive

correlation (0.1450) with income equality suggesting a higher GFCF may contribute to economic activities that impact income distribution, but other factors also influence income equality. The positive correlation (0.0150) indicates an extremely weak relationship between gross fixed capital formation and the employment rate. It suggests that GFCF has almost no direct impact on employment rates.

However, the positive correlation (0.01813) between gross fixed capital formation (GFCF) and primary school enrolment is extremely weak relationship. GFCF does not strongly influence primary school enrolment rates while correlation (0.0938) between gross fixed capital formation and secondary school enrolment appears to be a weak relationship suggesting that other factors likely have a more significant impact on secondary school enrolment rates.

The moderate positive correlation (0.2129) between gross fixed capital formation and life expectancy suggests investments in infrastructure and healthcare facilities associated with GFCF can positively impact life expectancy. Also, there is a moderate positive correlation (0.2107) between gross fixed capital formation and infant mortality. This suggests that investments in healthcare infrastructure and facilities, which are part of GFCF, can contribute to lower infant mortality rates.

The scatter charts show a graphical outlook of the correlation coefficients of output factors of human capital development against inclusive growth, income equality etc. in Figure 4.2.2.3 (a-d) and (e-h).

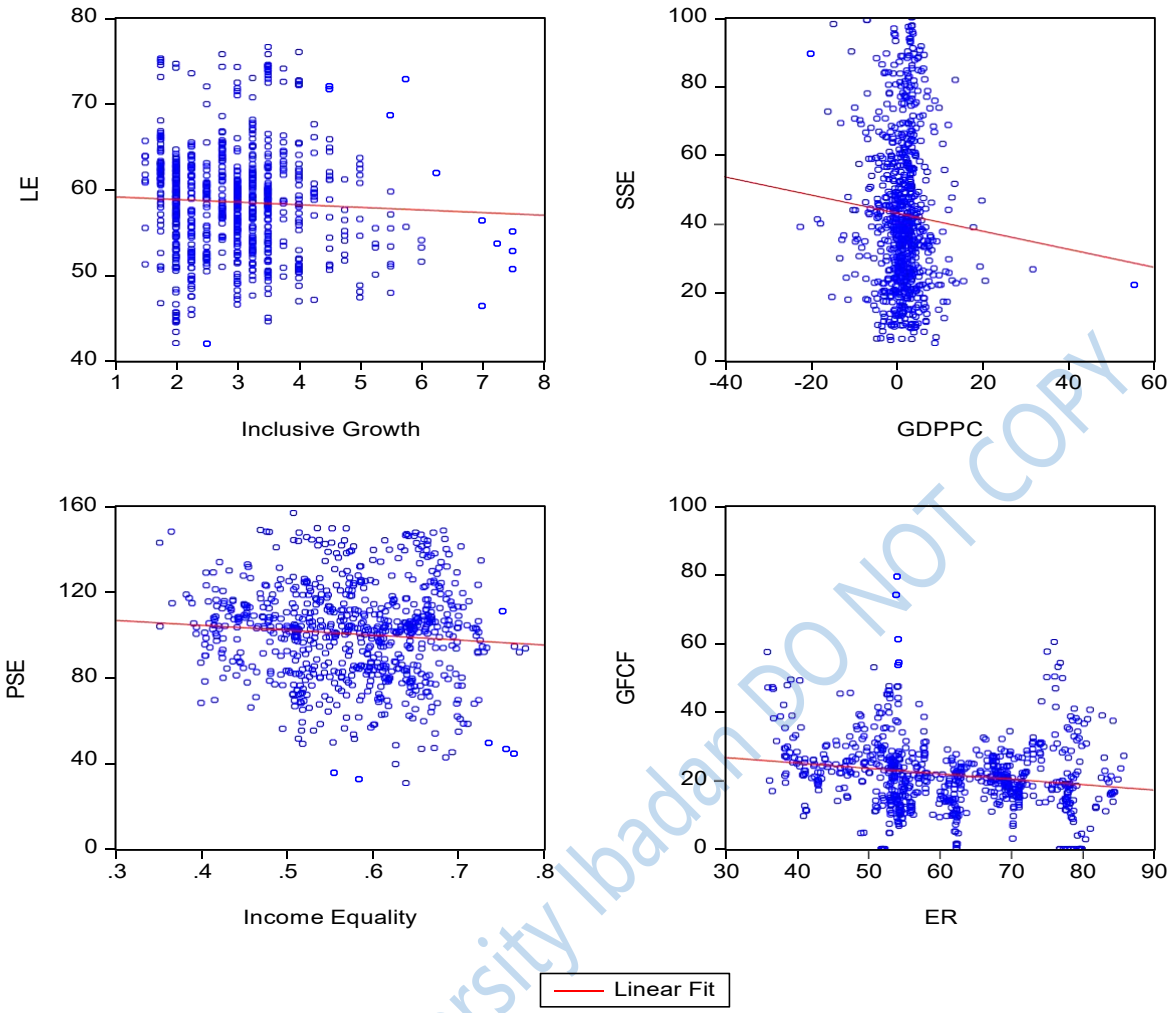



**Figure 4.2.2.3 (a-d):** Scatter graph of inclusive growth components and output factors of human capital development

**Source:** Author's computation (2023).

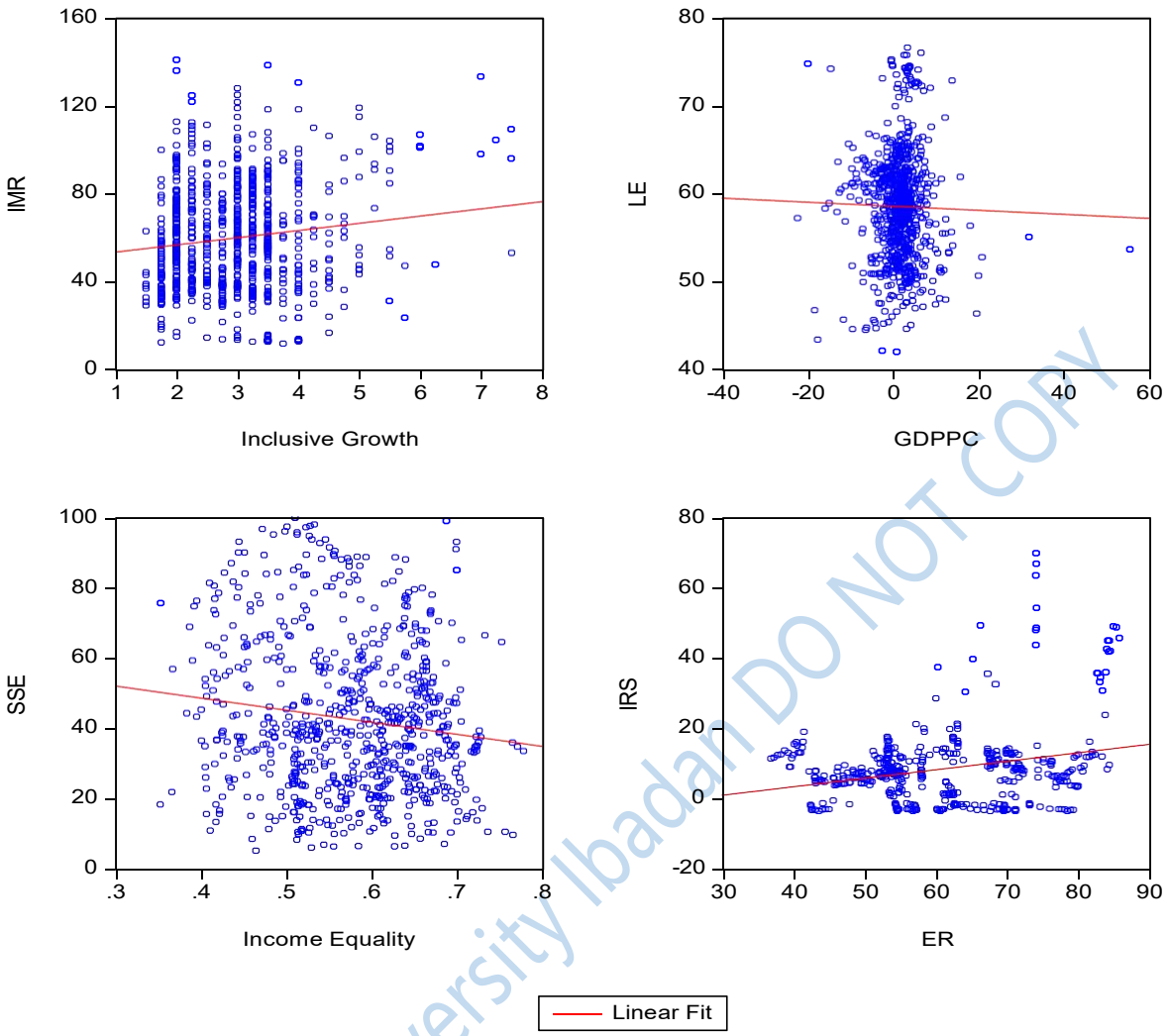



**Figure 4.2.2.3(e-h):** Scatter graph of inclusive growth components and output factors of human capital development

**Source:** Author's computation (2023).

**Table 4.2.2.3:** System GMM results on the Effects of Output factor of Human Capital Development on the Inclusive Growth

| Variables | Dependent Variable: | | | |
|---|---|---|---|---|
| | **GDPG per capita(GDPPCG)** | **Income Equality(EQU)** | **Employment Rate(EMP)** | **Inclusive Growth Index (INCG)** |
| GDPPCG(-1) | -0.0035** | | | |
| | (0.017) | | | |
| EQU(-1) | | 0.1210* | | |
| | | (0.089) | | |
| EMP (-1) | | | 1.0879*** | |
| | | | (0.000) | |
| INCG(-1) | | | | 0.1663 |
| | | | | (0.6787) |
| PSE | 0.0017** | 0.0007 | -0.0141* | -0.0327* |
| | (0.043) | (0.496) | (0.074) | (0.066) |
| SSE | -0.1773 | -0.0022 | 0.038381 | -0.0343** |
| | (0.2352) | (0.357) | (0.282) | (0.022) |
| LE | -0.1154 | 0.0010* | -0.0444 | 0.0484 |
| | (0.839) | (0.078) | (0.778) | (0.651) |
| IMR | -0.1615 | -0.0015* | 0.0197* | -0.0078** |
| | (0.041) ** | (0.098) | (0.062) | (0.025) |
| GFCF | -0.0310* | 0.00002*** | 0.0020* | -0.0031 |
| | (0.054) | (0.005) | (0.096) | (0.635) |
| IRS | -0.0426 | 0.0006* | 0.0047* | 0.0023 |
| | (0.566) | (0.070) | (0.087) | (0.885) |
| INFR | -0.6103** | 0.0014 | 0.0463 | -0.1084* |
| | (0.047) | (0.909) | (0.178) | (0.064) |
| TO | 0.2688** | 0.0008 | 0.9672** | -0.31001 |
| | (0.036) | (0.931) | (0.019) | (0.817) |
| Constant | 30.807 | 0.5066 | -4.7389 | 5.13026 |
| | (0.099) | (0.506) | (0.7433) | (0.162) |
| AR(1) | 0.003 | 0.047 | 0.050 | 0.0713 |
| AR(2) | 0.9377 | 1.0000 | 0.9997 | 0.6713 |
| Hansen J-test | 0.3504 | 0.6346 | 0.5896 | 0.2397 |
| Observations | 700 | 700 | 700 | 700 |

**Note:** ***, ** and * indicate significance at 1%, 5% and 10% respectively.

**Source:** Author's computation (2023).

As for the effects of output factor of human capital development on the inclusive growth, the first lagged of GDP per capita have a negative coefficient of approximately -0.0035. This suggests that the previous year's GDP per capita has a negative impact on the current year's GDP per capita growth. However, with p-value of 0.017 indicating that this relationship is statistically significant at the 5% level. The lagged one of income equality and employment rate has a positive coefficient and is highly statistically significant at the 10% and 1% significance level respectively. This suggests that the previous year's income equality and employment rate strongly influences the current income equality and employment rate. The statistical effect of primary school enrollment on GDP per capita, employment and inclusive growth index was established at 5%, 10% and 10% respectively. The results indicate that for every 1% improvement in primary school enrollment, GDP per capita, increases by 0.017%, while employment and inclusive growth index decreases by 1.41% and 0.33%, respectively. This implies that improvement in primary school enrollment is associated with an increase in GDP per capita. Similar results are evident for secondary school enrollment, which indicate that for every 1% improvement secondary school enrollment, inclusive growth index decreases by 2.2%. This implies that higher secondary school enrollment is associated with lower inclusive growth, which might indicate a trade-off between increased access to secondary education and inclusive growth.

Life expectancy has a positive coefficient and p-value of 0.078 indicates significant impact on income equality at the 10% level, suggesting that life expectancy is a significant predictor of income equality. Thus, infant mortality rate has a negative coefficient in GDPG per capita, income equality and inclusive growth with the p-value of 0.041, 0.098 and 0.025 respectively.

The results indicate that for every 1% increase in infant mortality rate cause GDP per capita, income equality and inclusive growth index decreases by 16.15%, 0.15% and 0.78%, respectively while employment increases by 1.97%. This invariably suggests that a decrease in the infant mortality rate is associated with higher GDPG per capita, income equality and inclusive growth.

Further, gross fixed capital formation has a negative coefficient in GDPG per capita and inclusive growth but is statistically significant at the 10% significance level. There is a statistical effect of 3.10% and 0.031% on GDPG per capita and inclusive growth for every 1% decrease in gross fixed capital formation. While a positive and significant coefficient of gross fixed capital formation in income equality and employment implies that higher investment in fixed capital (GFCF) is associated with higher income equality and employment. For our control variables, we find that interest rate spread foster income equality and employment as a significant driver of capital formation, which in turn promote economic activity, while trade openness is associated with a higher GDPG per capita and employment (Column 1 and 3). The study diagnostic test results satisfactory. It means that the panel system GMM approach is appropriate as well as the specifications of all empirical models. Also, the p values of AR (2) revealed that there is no presence of the second-order serial correlation problem while the Hansen test reveals that the instrumental variables are valid.



### 4.2.3 Analysis of the Third Hypothesis

This sub-section reports the empirical results relating to how labour productivity enhances inclusive growth in SSA countries.

### 4.2.3.1 Correlation Analysis and Scatter Plots

Table 4.2.3.1 below clearly shows degree of association exists between the variable of labour productivity and inclusive growth.

**Table 4.2.3.1:** Correlation Matrix

| Variable | *INCG* | *GDPPCG* | *INEQ* | *ER* | *GDPPPE* | *GFCF* | *DCPS* | *IRS* | *INF* | TO |
|---|---|---|---|---|---|---|---|---|---|---|
| INCG | 1 | | | | | | | | | |
| GDPPCG | 0.8092 | 1 | | | | | | | | |
| INEQ | 0.0682 | 0.0327 | 1 | | | | | | | |
| ER | 0.0681 | 0.0273 | 0.0527 | 1 | | | | | | |
| GDPPPE | 0.0102 | 0.0009 | 0.0922 | 0.5228 | 1 | | | | | |
| GFCF | 0.0278 | 0.0668 | 0.1855 | -0.0611 | 0.2107 | 1 | | | | |
| DCPS | 0.0168 | 0.0033 | 0.1013 | 0.2621 | 0.7142 | 0.2290 | 1 | | | |
| IRS | 0.0067 | 0.1020 | 0.1552 | 0.2477 | 0.1004 | 0.0388 | 0.1528 | 1 | | |
| INF | 0.0717 | 0.1741 | 0.0369 | 0.0230 | 0.0421 | 0.0793 | 0.0953 | 0.1887 | 1 | |
| TO | 0.0494 | 0.0584 | 0.1781 | 0.2824 | 0.6392 | 0.4451 | 0.6260 | 0.064 | 0.045 | 1 |

**Note:** INCG-Inclusive Growth Index; GDPPCG- GDP Per Capita Growth; EQ-Income Equality; ER – Employment Rate; GDPPPE- GDP Per Person Employed; GFCF- Gross Fixed Capital Formation; DCPS- Domestic Credit to Private Sector; IRS-Interest Rate Spread; INF- Inflation Rate and TO- Trade Openness

**Source:** Author's computation (2023).

The coefficients in Table 4.2.3.1 represents the relationships between GDP per person employed (measurement of labour productivity) and components of inclusive growth such as GDP Per Capita Growth (GDPPCG), income equality (INEQ) and employment rate (ER). GDP per person employed (GDPPPE) has a very weak positive association (0.0009) with GDP per capita growth indicates that changes in GDPPPE have almost no direct impact on the rate of GDP per capita growth. In like manner, positive association (0.0922) suggests a weak relationship between GDP per person employed and income equality. While there is some connection, other factors likely have a more significant influence on income equality. Also, there is a very weak positive association (0.0102) relationship between GDP per person employed and inclusive growth index implying that GDP per person employed does not appear to strongly impact inclusive growth. While, the strong positive correlation (0.5228) between GDP per person

employed and the employment rate indicates that an increase in GDP per person employed (GDPPPE) is associated with a higher employment rate, suggesting that productivity and employment are linked.

Notably, the study also shows a moderate positive correlation (0.2107) between gross fixed capital formation and GDP per person employed. This indicates that increased capital formation can contribute to higher productivity per employed person. While a positive correlation (0.1855) between gross fixed capital formation and income equality suggests that higher gross fixed capital formation (GFCF) may impact income distribution to some extent, but other factors also influence income equality. Furthermore, GDP Per capita growth has a strong positive relationship (0.8092) with Inclusive Growth

This suggests as a country's GDP per capita grows, it tends to experience more inclusive growth, where the benefits of economic expansion are shared broadly among the population. Thus, the weak positive correlation (0.0327) between income equality and GDP per capita growth implies that changes in income equality do not appear to have a substantial impact on the rate of GDP per capita growth. More so, employment rate tends to correlate with GDP per capita growth at 0.273 indicating higher employment rates are associated with higher economic growth, contributing to the increase in GDP per capita. The graphical results of the correlation coefficients of labour productivity (GDP per person employed) against inclusive growth, and other variables are presented in Figure 4.2.3.1 (a-d) and (e-h).

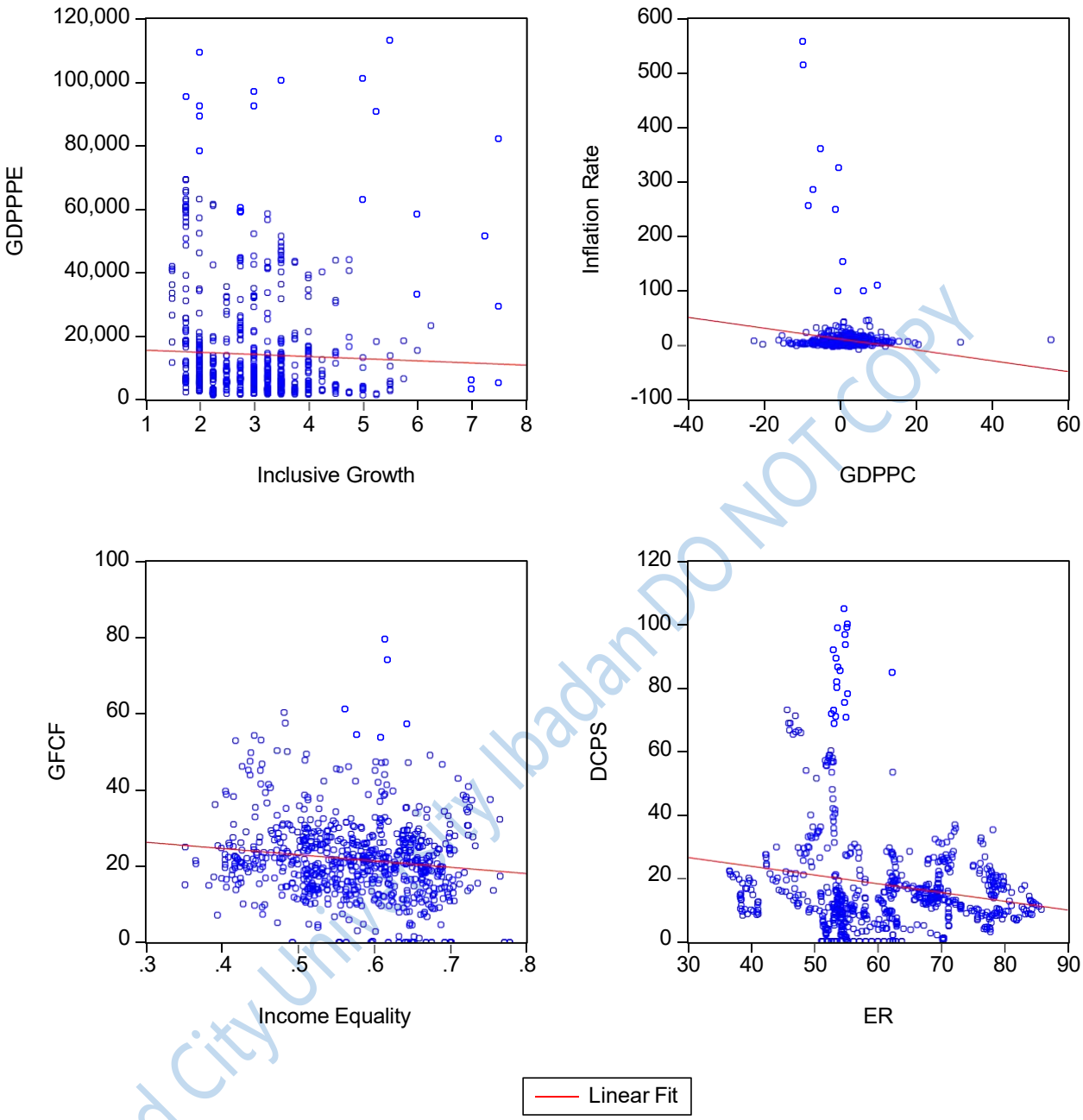



**Figure 4.2.3.1 (a-d):** Scatter graph of labour productivity and inclusive growth components

**Source:** Author's computation (2023).

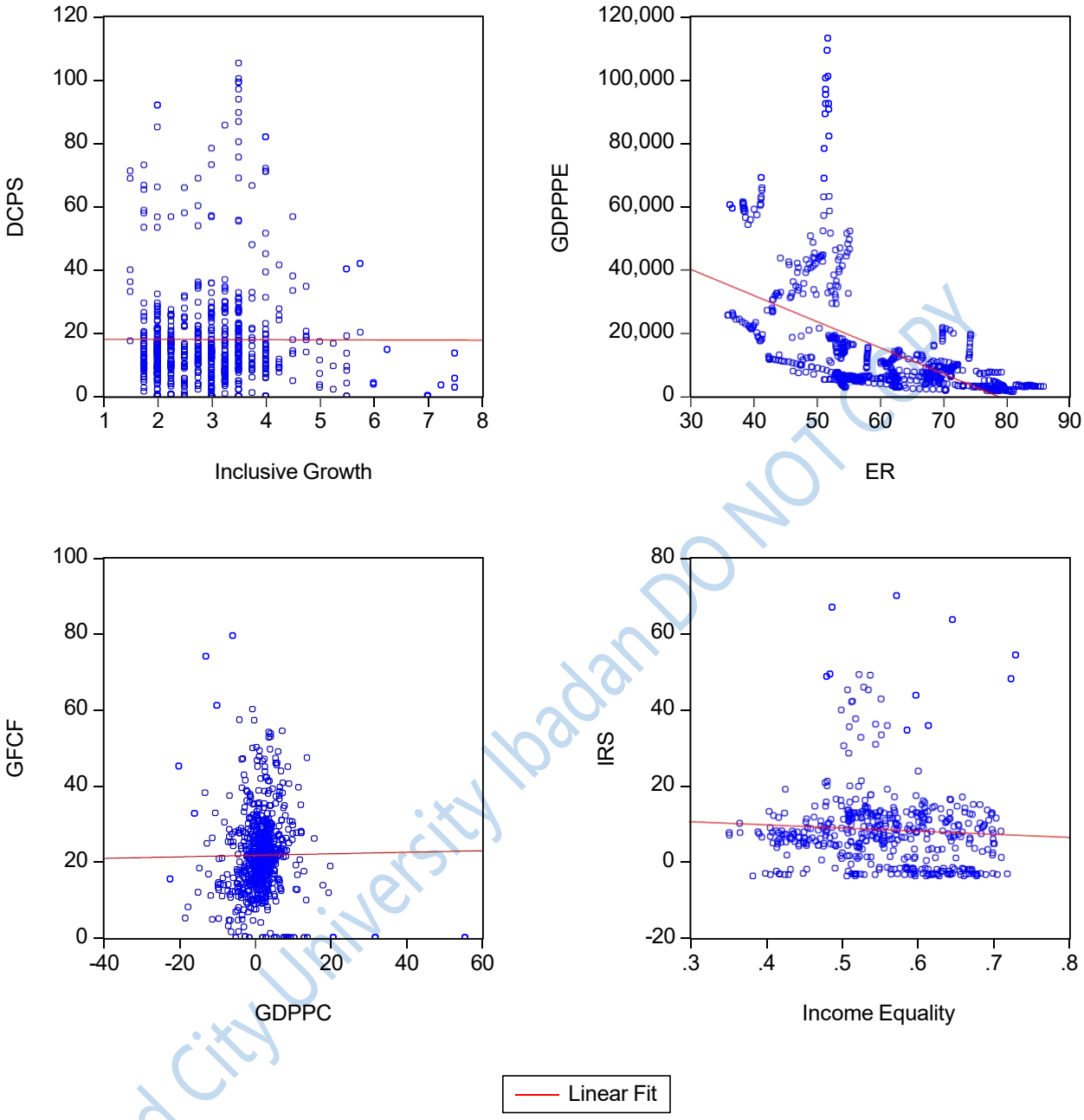





**Figure 4.2.3.1 (e-h):** Scatter graph of labour productivity and inclusive growth components

**Source:** Author's computation (2023).

**Table 4.2.3.2:** System GMM results on the Effects of Labour Productivity on the Inclusive Growth

| Variables | Dependent variable: Inclusive growth | | | |
|---|---|---|---|---|
| | GDPG per capita(GDPPCG) | Income Equality(EQU) | Employment Rate(EMP) | Inclusive Growth Index (INCG) |
| GDPPCG(-1) | -0.2924** (0.034) | | | |
| EQU(-1) | | -3.0154* (0.075) | | |
| EMP (-1) | | | 0.99045*** (0.000) | |
| INCG(-1) | | | | -0.1281** (0.036) |
| GDPPPE | 0.0003* (0.086) | -0.00001** (0.048) | 0.00005** (0.025) | -0.00006* (0.074) |
| GFCF | -0.0328* (0.084) | -0.0100 (0.492) | 0.0446 (0.476) | -0.0225* (0.089) |
| DCPS | -0.2005 (0.534) | 0.0060** (0.010) | -0.0156*** (0.008) | 0.0202** (0.023) |
| IRS | -0.1013 (0.472) | -0.0017** (0.032) | 0.0067* (0.092) | -0.0054 (0.406) |
| INFR | -0.0059** (0.032) | -0.0006** (0.018) | 0.0015 (0.263) | 0.0003 (0.162) |
| TO | 0.2967*** (0.002) | 0.0002* (0.077) | 0.0057 (0.390) | 0.0278 (0.554) |
| Constant | -15.036 (0.303) | 2.4800 (0.441) | -1.3936 (0.809) | 2.4086* (0.068) |
| AR(1) | 0.005 | 0.037 | 0.049 | 0.0019 |
| AR(2) | 0.994 | 0.580 | 0.668 | 0.4717 |
| Hansen J-test | 0.3347 | 0.5706 | 0.2425 | 0.381 |
| Observations | 629 | 629 | 629 | 629 |

**Note:** ***, ** and * indicate significance at 1%, 5% and 10% respectively.

**Source:** Author's computation (2023).

Table 4.2.3.2revealed that all the coefficients one year lagged of inclusive growth and its components (except employment) have negative and significant impact on their current levels. The coefficient of the first lagged of employment is positive (0.991) and statistically significant at the 1% level. This suggests that the previous year's employment rate has a positive impact on

the current year's employment rate.The estimated parameter show that GDP per person employed in GDPG per capita and employment has positive coefficients and statistically significant at 5% and 10% respectively. This means that 1% increase in GDP per person employed may cause GDPG per capita and employment to increase by 0.0003 and 0.00005 respectively. While the negative and statistically significant at 5% and 10% of GDP per person employed in income equality and inclusive growth index implies that 1% increase in GDP per person employed may cause income equality and inclusive growth index to decrease by 0.001% and 0.006% respectively.

Additionally, we find that coefficient of gross fixed capital formation (GFCF) is negative and statistically significant in GDPG per capita and inclusive growth index. The estimation shows that for every 1% increase in gross fixed capital formation (GFCF), GDPG per capita and inclusive growth index are decreased by 3.28% and 2.25%, respectively. Our empirical evidence on the effects domestic credit to private sector provides support for the theorised claim that access to credit facilities can build capacities for income equality and enhance inclusive growth. The findings also provide evidence for the interest rate spread suggesting that for every 1% increase in interest rate spread, employment rate tends to increase by 0.67%. This implies that wider interest rate spread drive employment which in foster shared prosperity.

Inflation has negative coefficient and significant effect on GDPG per capita and income equality. This suggests that higher inflation could negatively impact GDPG per capita and income equality

For trade openness, positive coefficient and significant effect on GDPG per capita and income equality is observed. For every 1% increase in trade openness, GDPG per capita and income equality tends to increase by 29.67% and 0.02% respectively. This implies that particularly, with enhance globalisation in the SSA region following the implementation of the AfCFTA, trade

openness can foster commercial connectivity and information dissemination. This will not only enhance the development of the human capital base needed to meet the technical needs of region output productivity but foster GDP growth and increase effort in shared prosperity.

In testing of validity of the instruments employed in the estimation of the system GMM in Table 4.2.3.2, the P-values of the coefficients, there was indeed first order autocorrelation in the disturbance term, while there was no second order autocorrelation because the P-value for AR(1) test was less than 5 per cent suggesting the rejection of the null hypothesis of 'no autocorrelation', while that of AR(2) was more than 5 per cent suggesting the acceptance of the null hypothesis of 'no autocorrelation' in the error term. Hansen J-statistic test is the most widely used test in GMM estimation to assess the appropriateness of the instruments employed in the estimation, the instrumentation validity was confirmed as p-value of J-statistic is greater than 0.25.

### 4.2.4 Analysis of the Fourth Hypothesis

This sub-section reports the empirical results relating to the joint effect of human capital development and labour productivity on inclusive growth.

#### 4.2.4.1 Correlation Analysis and Scatter Plots (Input factor)

Table 4.2.4.1a depicts the degree of association between joint effect of input of human capital development (government expenditure on education (GEE), Government expenditure on health infrastructure (GEHI)), and labour productivity and components of inclusive growth index.

**Table 4.2.4.1a:** Correlation Matrix

| Variable | *INCG* | *GDPPCG* | *INEQ* | *ER* | *GDPPPE* | *GEE*GDPPPE* | *GEHI*GDPPPE* | *GFCF* | *DCPS* | *IRS* |
|---|---|---|---|---|---|---|---|---|---|---|
| INCG | 1 | | | | | | | | | |
| GDPPCG | 0.825 | 1 | | | | | | | | |
| EQ | 0.102 | 0.008 | 1 | | | | | | | |
| ER | 0.137 | 0.027 | 0.021 | 1 | | | | | | |
| GDPPPE | 0.050 | 0.026 | 0.107 | 0.542 | 1 | | | | | |
| GEE*GDPPPE | 0.084 | 0.065 | 0.158 | 0.426 | 0.864 | 1 | | | | |
| GEHI*GDPPPE | 0.087 | 0.079 | 0.129 | 0.490 | 0.902 | 0.934 | 1 | | | |
| GFCF | 0.034 | 0.028 | 0.260 | 0.117 | 0.238 | 0.179 | 0.143 | 1 | | |
| DCPS | 0.006 | 0.012 | 0.104 | 0.270 | 0.719 | 0.586 | 0.648 | 0.231 | 1 | |
| IRS | 0.006 | 0.101 | 0.157 | 0.2271 | 0.113 | 0.114 | 0.118 | 0.041 | 0.1735 | 1 |

**Note:** INCG-Inclusive Growth Index; GDPPCG- GDP Per Capita Growth; EQ-Income Equality; ER – Employment Rate; GDPPPE- GDP Per Person Employed; GEE*GDPPPR- Interactive effect of Government Expenditure on Education and GDP Per Person Employed; GEHI*GDPPPR - Interactive effect of Government Expenditure on Health and GDP Per Person Employed; GFCF- Gross Fixed Capital Formation; IRS-Interest Rate Spread; INF- Inflation Rate and TO- Trade Openness.

**Source:** Author's computation (2023).

The table shows that a strong positive correlation (0.825) between GDP per capita growth and inclusive growth. This implies that higher GDP per capita growth is strongly associated with greater inclusivity in economic development. Thus, the relationship between income equality and inclusive growth is positive (0.1015) suggests there is some connection; other factors likely have a more significant influence on inclusivity. While, positive correlation (0.1368) exists between the employment rate and inclusive growth. This suggests that changes in the employment rate influence inclusive growth. Also variations in the employment rate appear to have a substantial impact on income equality.

Between GDP per person employed (GDPPPE) and GDP per capita growth (GDPPCG), the positive correlation (0.02611) indicates changes in GDP per person employed do influence GDPPCG. Also, there is strong positive correlation (0.5415) between GDP per person employed and the employment rate. An increase in GDPPPE is strongly associated with a higher employment rate, suggesting that productivity and employment are closely linked.

The correlation (0.0839) between the joint effect of government expenditure on education and GDP per person employed (GEE*GDPPPE) and inclusive growth (INCG) suggests a weak relationship while there is some connection, other factors likely play a more substantial role in influencing inclusive growth. Likewise, the joint effect of government expenditure on education and GDP per person employed does influence GDPPCG. The combined impact of government expenditure on education and GDP per person employed is moderately associated with income equality.

The coefficient correlation (0.4259) of joint effect of government expenditure on education and GDP per person employed is strongly associated with higher employment rates. Similarly, the combination of government expenditure on education and GDP per person employed has a strong positive influence on GDPPPE. For the combined government expenditure on health infrastructure and GDP per person employed, exhibits a weaker association with GDP per capita growth. However, the joint effect of government expenditure on health infrastructure and GDP per person employed is moderately associated with income equality. The strong positive correlation (0.490) relationship between GEHI*GDPPPE and the employment rate (ER) suggests a robust relationship. This suggests that the combination of government expenditure on health infrastructure and GDP per person employed is strongly associated with higher employment rates.

Notably, the positive correlation (0.17965) between GFCF and the joint effect of government expenditure on education and GDP per person employed (GEE*GDPPPE) suggests a moderate relationship. Gross fixed capital formation is moderately associated with this combined indicator. Additionally, there is a strong positive correlation (0.586) between domestic credit to private sector (DCPS) and the joint effect of government expenditure on education and GDP per person employed (GEE*GDPPPE). DCPS is strongly associated with this combined indicator, suggesting its significant influence on education-related productivity. In same manner, the strong positive correlation (0.648) between DCPS and the joint effect of government expenditure on health infrastructure and GDP per person employed (GEHI*GDPPPE) suggests a robust relationship. DCPS is strongly associated with this combined indicator, indicating its significant influence on health infrastructure-related productivity. The scatter graphs showing the plot of combined effect of input factors of human capital development against observed components of inclusive growth index are presented in Figure 4.2.4.1 (a-e).

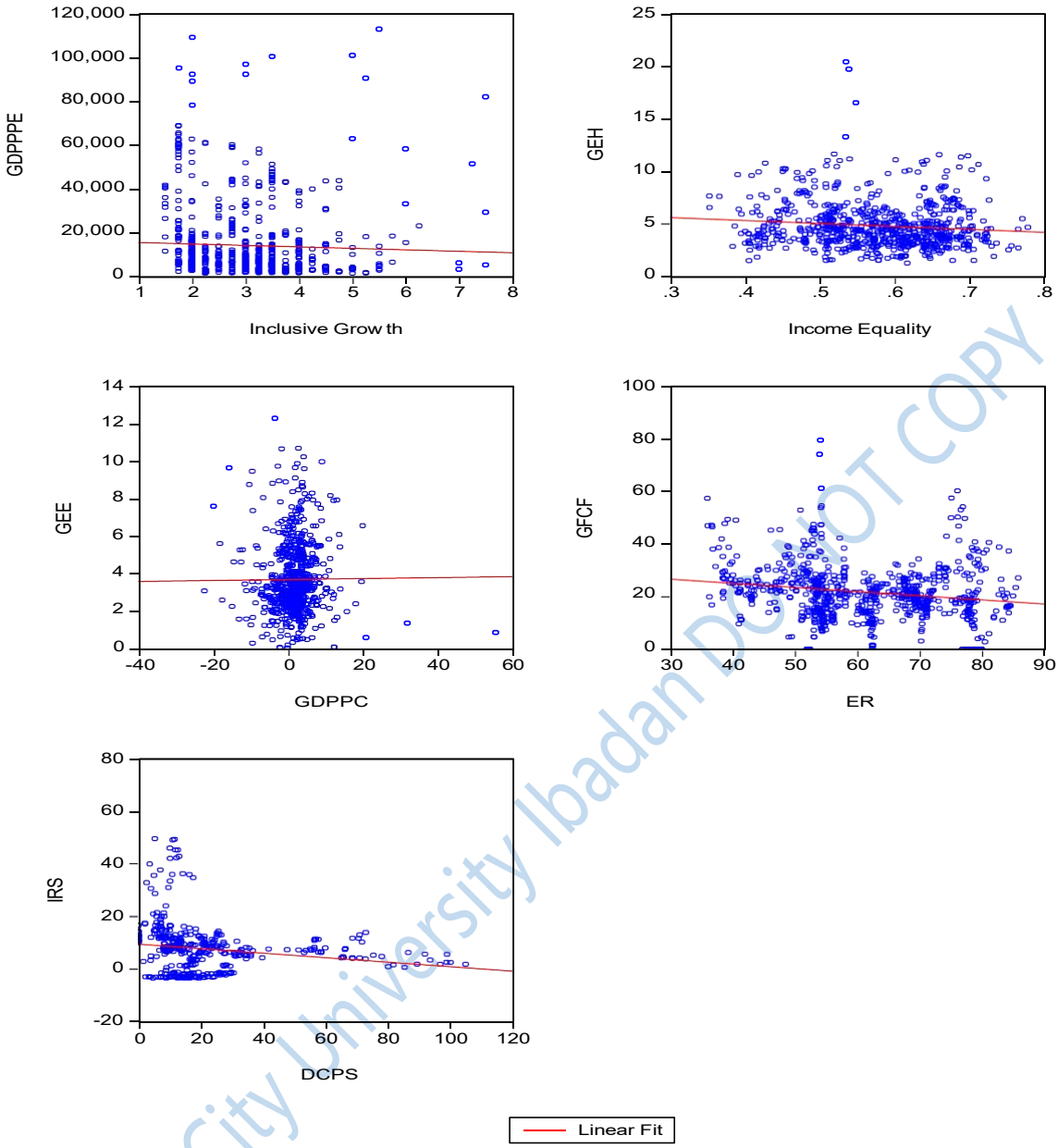





**Figure 4.2.4.1(a-e):** Scatter graph of input factor of human capital development, labour productivity and inclusive growth

**Source:** Author's computation (2023).

**Table 4.2.4.1b:** System GMM results on the Joint Effect of Input factor of Human Capital Development and Labour Productivity on Inclusive Growth

| Variables | **Dependent Variable:** Inclusive growth | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **GDPG per capita(GDPPCG)** | | **Income Equality(EQU)** | | **Employment Rate(EMP)** | | **Inclusive Growth Index (INCG)** | |
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** | 8 |
| GDPPCG(-1) | -0.3608*<br>(0.082) | -0.6226*<br>(0.055) | | | | | | |
| EQU(-1) | | | -0.6678<br>(0.658) | -0.2564*<br>(0.080) | | | | |
| EMP (-1) | | | | | 1.0810***<br>(0.000) | 1.2909*<br>(0.097) | | |
| INCG(-1) | | | | | | | 0.0730<br>(0.182) | 0.1019*<br>(0.061) |
| GEE | 0.2328**<br>(0.020) | | 0.0754***<br>(0.005) | | -0.0111<br>(0.981) | | 0.4324**<br>(0.023) | |
| GEH | | -1.0923*<br>(0.092) | | -0.1148*<br>(0.081) | | 0.3221<br>(0.653) | | -0.0572<br>(0.737) |
| GDPPPE | -0.00001<br>(0.982) | 0.0006***<br>(0.002) | 0.00002***<br>(0.008) | 0.00003<br>(0.899) | -0.0007**<br>(0.023) | 0.0003**<br>(0. 038) | -0.00002<br>(0.631) | -0.0001<br>(0.071) |
| GEE* GDPPPE | -0.003***<br>(0.006) | | -0.0003<br>(0.626) | | -0.00001*<br>(0.094) | | 0.0056<br>(0.912) | |
| GEH* GDPPPE | | -0.0001<br>(0.181) | | -0.0001*<br>(0.095) | | -0.00007**<br>(0.038) | | 0.0001*<br>(0.089) |
| GFCF | -0.1216**<br>(0.039) | -0.2784<br>(0.499) | -0.0019**<br>(0.042) | -0.0626**<br>(0.016) | -0.0337**<br>(0.031) | -0.0895<br>(0.721) | -0.0456***<br>(0.006) | -0.0003<br>(0.995) |
| IRS | -0.0784<br>(0.571) | 0.1966**<br>(0.046) | -0.0258<br>(0.651) | -0.0076<br>(0.865) | 0.0368<br>(0.650) | 0.1254<br>(0.695) | -0.0045<br>(0.660) | -0.0407<br>(0.421) |
| INFR | -0.0109<br>(0.606) | -0.0062<br>(0.946) | -0.0030<br>(0.722) | -0.0229<br>(0.071) | 0.0044<br>(0.783) | 0.0179<br>(0.779) | 0.0111<br>(0.073) | -0.0025<br>(0.826) |
| TO | -0.3009<br>(0.228) | 0.5584<br>(0.421) | -0.0107<br>(0.673) | 0.0035<br>(0.872) | 0.0235<br>(0.089) | 0.0917<br>(0.705) | -2.1060<br>(0.926) | 0.0141<br>(0.835) |
| Constant | -14.427<br>(0.323) | -19.953<br>(0.619) | 3.7403<br>(0.604) | 11.002<br>(0.860) | -6.4661<br>(0.572) | -24.759<br>(0.683) | 0.8583<br>(0.609) | (2.8752)<br>(0.181) |
| AR(1) | 0.064 | 0.003 | 0.600 | 0.026 | 0.096 | 0.038 | 0.156 | 0.018 |
| AR(2) | 0.896 | 0.996 | 0.999 | 0.849 | 0.999 | 0.898 | 0.876 | 0.696 |
| Hansen J-test | 0.4188 | 0.6807 | 0.3841 | 0.4560 | 0.5126 | 0.1215 | 0.5292 | 0.2971 |
| Observations | 708 | 708 | 708 | 708 | 708 | 708 | 708 | 708 |

**Note:** ***, ** and * indicate significance at 1%, 5% and 10% respectively.

**Source:** Author's computation (2023).

Table 4.2.4.1b shown the estimated interactive effect of input factors of human capital development on observed components of inclusive growth, the results show that the first lagged

of GDP per capita (GDPPCG) in model one and two is negatively significant indicating that the previous year of GDP per capita has a negative impact on the current year of GDP per capita. The first lagged of income equality also demonstrates negative impact on the current year in model two while model one is not statistically significant. For employment, both in model one and model two, the first lagged of employment has positive coefficients and statistically significant. This implies that the previous year of employment has a positive impact on the current year of employment in model one and model two. In same way, the first of lagged of inclusive growth index indicates positive coefficients in model one and model two while model one is not statistically significant. This implies that the previous year of inclusive growth index has a positive impact on the current year of inclusive growth index in model two.

The findings show that the joint effect of government expenditure on education (GEE) and GDPPPE has negative and significant impact on GDP per capita growth component of inclusive growth index in model one. On the magnitude for the interactive effect, a 1% increase in government expenditure on education (GEE) and GDPPPE decrease GDP per capita growth by 0.3% while the impact of joint effect of government expenditure on health (GEH) and GDPPPE on GDP per capita growth is not statistically significant in model two. This shows that governments of SSA countries have not invested significantly enough in the education sector for labour to benefit from.

For the income equality, the interactive effect of government expenditure on health (GEH) and GDPPPE exhibits negative and significant impact on income equality in model two. On the magnitude for the interactive effect, a 1% increase in government expenditure on health (GEH) and GDPPPE will decrease income equality by 0.006% while the impact of joint effect of government expenditure on education (GEE) and GDPPPE on income equality is not statistically

significant. This implies that inadequate healthcare financing hinder labor to increase productivity since healthy worker tends to be productive at work

The results further reveal that the coefficients of interactive effect of government expenditure on education (GEE) and GDPPPE as well as interactive effect of government expenditure on health (GEH) and GDPPPE exhibits negative and significant impact on employment. This suggests that 1% increase in both interactive effect of government expenditure on education and GDPPPE, and government expenditure on health (GEH) and GDPPPE decrease employment by 0.001% and 0.007% respectively.

The joint effect of government expenditure on education (GEE) and GDPPPE as well as joint effect of government expenditure on health (GEH) and GDPPPE indicates positive coefficients but only joint effect of government expenditure on health (GEH) and GDPPPE has significant impact on inclusive growth index. This indicates that education and healthcare with good financing plan enhance human capital development through good levels of education and health that will empower the citizens to participate in varied economic activities and benefit from the growth process.

As shown in the table, our model passes the Hansen post-estimation test of valid overidentifying restrictions. Similarly, based on the Arellano-Bond test we can conclude that the model does not suffer any autocorrelation problem. Accordingly, there is enough evidence to suggest that the model is correctly specified.



**4.2.4.2 Correlation Analysis and Scatter Plots (Output factor)**

Table 4.2.4.2b depicts the degree of association between joint effect of output of human capital development (primary school enrolment rate (PSE),secondary school enrollment rate (SSE), life

expectancy (LE), infant mortality (IMR)), and labour productivity and components of inclusive growth index.

**4.2.4.2a:** Correlation analysis (output factor)

| Variable | *INCG* | *GDPPCG* | *INEQ* | *ER* | *GDPPPE* | *PSE*GDPPPE* | *SSE*GDPPPE* | *LE*GDPPPE* | *IM*GDPPPE* | *DCPS* |
|---|---|---|---|---|---|---|---|---|---|---|
| INCG | 1 | | | | | | | | | |
| GDPPCG | 0.837 | 1 | | | | | | | | |
| EQ | 0.024 | 0.112 | 1 | | | | | | | |
| ER | 0.108 | 0.006 | 0.057 | 1 | | | | | | |
| GDPPPE | 0.007 | 0.001 | 0.016 | 0.545 | 1 | | | | | |
| PSE*GDPPPE | 0.031 | 0.008 | 0.015 | 0.578 | 0.953 | 1 | | | | |
| SSE*GDPPPE | 0.059 | 0.042 | 0.040 | 0.535 | 0.857 | 0.885 | 1 | | | |
| LE*GDPPPE | 0.017 | 0.010 | 0.023 | 0.554 | 0.992 | 0.957 | 0.893 | 1 | | |
| IM*GDPPPE | 0.083 | 0.082 | 0.002 | 0.369 | 0.866 | 0.751 | 0.515 | 0.809 | 1 | |
| DCPS | 0.002 | 0.020 | 0.113 | 0.185 | 0.257 | 0.270 | 0.547 | 0.338 | 0.102 | 1 |

**Note:** INCG-Inclusive Growth Index; GDPPCG- GDP Per Capita Growth; EQ-Income Equality; ER – Employment Rate; GDPPPE- GDP Per Person Employed; PSE*GDPPPE- Interactive effect of Primary School Enrollment and GDP Per Person Employed; SSE*GDPPPE - Interactive effect of Secondary School Enrolment and GDP Per Person Employed; LE*GDPPPE- Interactive effect of Life Expectancy and GDP Per Person Employed; IM*GDPPPE- Interactive effect of Infant Mortality Rate and GDP Per Person Employed and DCPS- Domestic Credit to Private Sector

**Source:** Author's computation (2023).

The table show that GDP per capita growth (GDPPCG) and inclusive growth (INCG) has a strong positive correlation (0.837) indicates a higher GDPPCG is strongly associated with greater inclusivity in economic development.

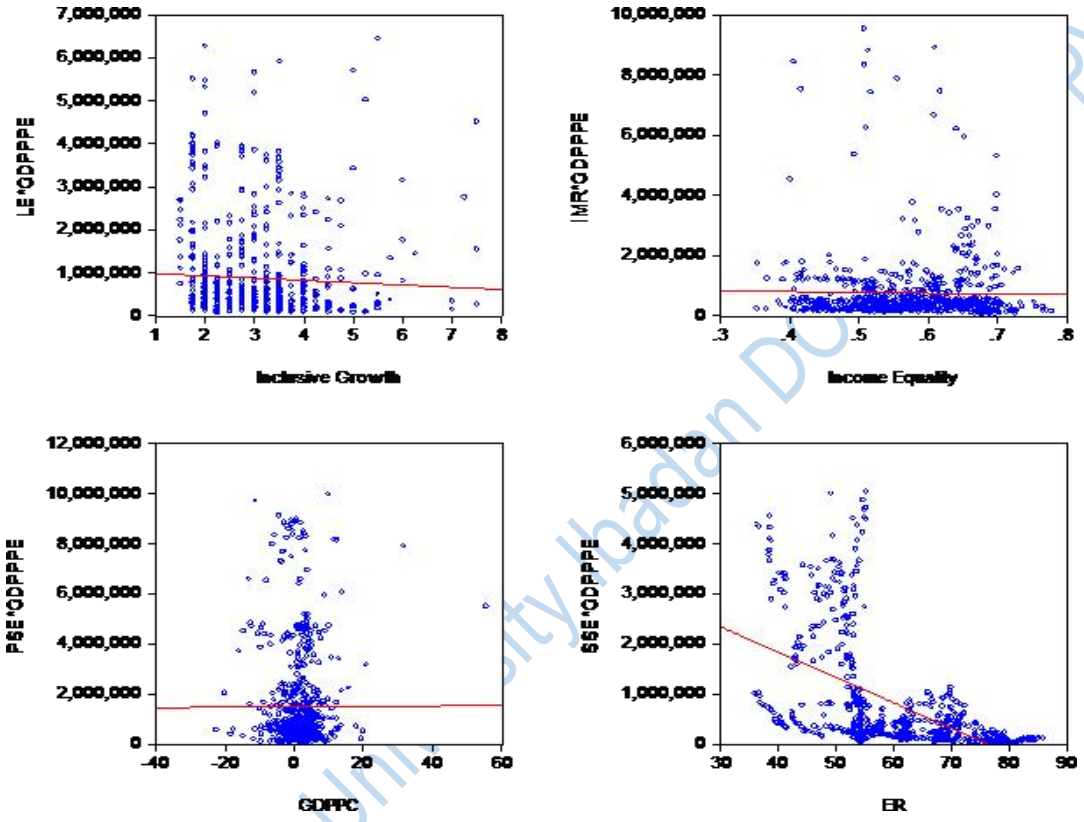
On the relationship between the joint effect of primary school enrolment (PSE) and GDP per person employed (GDPPPE) on the employment rate (ER), the strong positive correlation (0.578) indicates a robust relationship between combined PSE and GDPPPE and the employment rate (ER). Higher values of this joint effect are strongly associated with a higher employment rate, suggesting a strong link between primary school enrolment, GDP per person employed, and employment. In same vein, the robust relationship between the combination of secondary school

enrolment (SSE) and GDP per person employed (GDPPPE) and the employment rate (ER) suggests higher values of the combination of secondary school enrolment (SSE) and GDP per person employed (GDPPPE) are strongly associated with a higher employment rate.

The robust relationship between the joint effect of PSE and GDPPPE on GDP per person employed (GDPPPE) implies changes in this joint effect have a significant impact on GDPPPE, indicating that both primary school enrolment and GDP per person employed are strongly linked to productivity. In same way, a highly robust positive correlation (0.857) between joint effect of secondary school enrolment (SSE) and GDP per person employed (GDPPPE) on GDP per person employed (GDPPPE) suggests that changes in the combination of secondary school enrolment (SSE) and GDP per person employed (GDPPPE) have a significant impact on GDPPPE, indicating that both secondary school enrolment and GDP per person employed are strongly linked to productivity.

In addition, the combination of life expectancy and GDP per person employed exhibits a strong positive correlation of 0.554 and 0.992 with employment rate and GDP per person employed respectively. This indicates that higher values of these coefficients are strongly associated with a higher employment rate and GDP per person employed which implies a strong link between combined life expectancy and GDP per person employed, and employment, GDP per person employed. More so, there is a very strong positive correlation (0.866) between combined infant mortality and GDP per person employed (GDPPPE) and GDP per person employed. This suggests that changes in combined infant mortality and GDP per person employed (GDPPPE) have a highly positive correlation with GDPPPE, indicating that infant mortality and GDP per person employed are strongly intertwined and influential on productivity.

The pictorial views of the correlation coefficients of interactive effect of output factors of human capital development, labour productivity and other variables of interest are depicted in the scatter graph in Figure 4.2.5.2 (a-d) and (e-h).



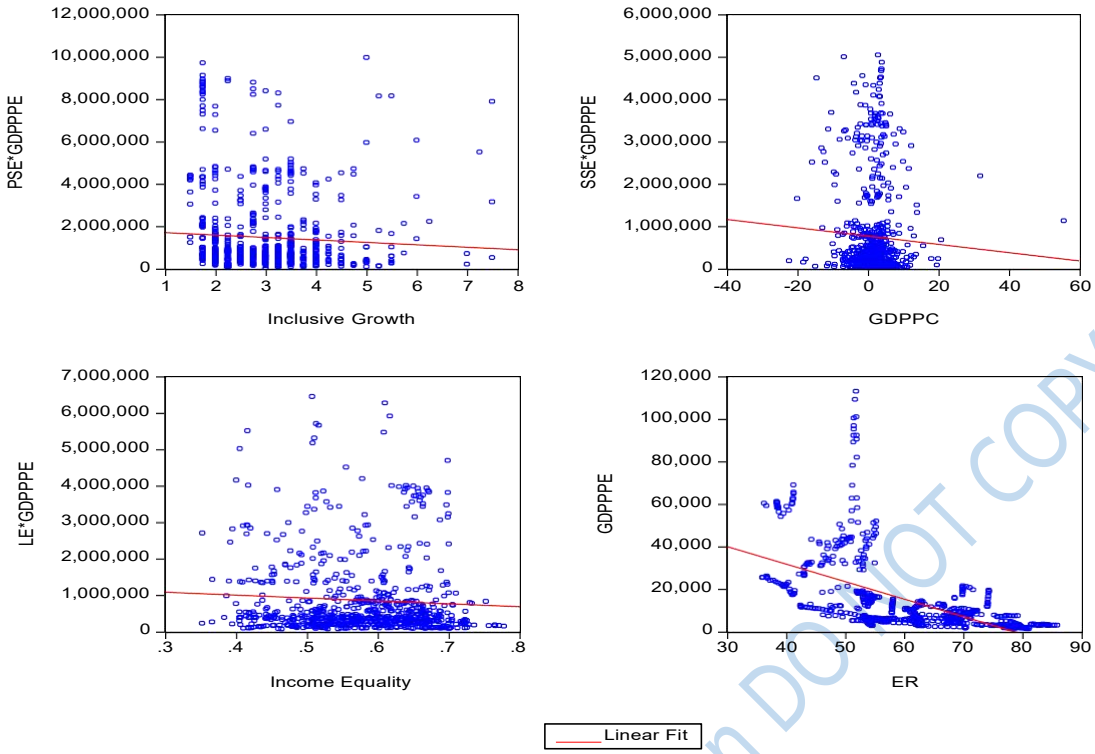



**Figure 4.2.4.2 (a-h):** Scatter graph of output factor of human capital development, labour productivity and inclusive growth

**Source:** Author's computation (2023).

**Table 4.2.4.2b:** System GMM results on the joint effect of output factor of human capital development and labour productivity on inclusive growth

| Variable | **Dependent Variables:** Inclusive Growth | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **GDPG per capita(GDPPCG)** | | | | **Income Equality(EQU)** | | | | **Employment Rate(EMP)** | | | | **Inclusive Growth Index (INCG)** | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| GDPPCG(-1) | 0.233 | -0.247*** | 1.622* | 0.3457 | | | | | | | | | | | | |
| | (0.160) | (0.002) | (0.072) | (0.620) | | | | | | | | | | | | |
| EQU(-1) | | | | | 0.934* | -0.079 | -0.163 | 0.149 | | | | | | | | |
| | | | | | (0.057) | (0.761) | (0.481) | (0.799) | | | | | | | | |
| EMP (-1) | | | | | | | | | 1.045*** | 1.002*** | 1.019*** | 1.161** | | | | |
| | | | | | | | | | (0.000) | (0.001) | (0.000) | (0.020) | | | | |
| INCG(-1) | | | | | | | | | | | | | 0.0415 | 0.3120 | -0.0665 | -0.0774 |
| | | | | | | | | | | | | | (0.572) | (0.283) | (0.510) | (0.150) |
| PSE | 0.273* | | | | 0.205** | | | | -0.06* | | | | -0.006** | | | |
| | (0.078) | | | | (0.025) | | | | (0.068) | | | | (0.034) | | | |
| SSE | | 0.881 | | | | -0.061** | | | | 0.052*** | | | | -0.204** | | |
| | | (0.278) | | | | (0.044) | | | | (0.007) | | | | (0.021) | | |
| LE | | | 9.041 | | | | -0.034 | | | | -0.142** | | | | -0.075 | |
| | | | (0.682) | | | | (0.190) | | | | (0.018) | | | | (0.197) | |
| IMR | | | | -1.251 | | | | 0.047 | | | | 0.167** | | | | 0.027 |
| | | | | (0.514) | | | | (0.134) | | | | (0.011) | | | | (0.122) |
| GDPPPE | -0.001 | 0.003 | 0.027** | -0.004* | 0.001* | -0.006 | -0.005 | 0.001** | -0.002** | 0.002 | -0.004 | 0.006 | -0.001** | -0.008** | -0.001 | 0.010 |
| | (0.522) | (0.716) | (0.029) | (0.091) | (0.053) | (0.131) | (0.836) | (0.045) | (0.025) | (0.399) | (0.271) | (0.119) | (0.011) | (0.034) | (0.276) | (0.350) |
| PSE×GDPPPE | 0.006 | | | | -0.001* | | | | 0.021* | | | | 0.002 | | | |
| | (0.518) | | | | (0.053) | | | | (0.096) | | | | (0.150) | | | |
| SSE×GDPPPE | | -0.008* | | | | 0.007** | | | | -0.006** | | | | 0.002* | | |
| | | (0.096) | | | | (0.016) | | | | (0.028) | | | | (0.059) | | |
| LE×GDPPPE | | | -0.004* | | | | 0.021 | | | | 0.002** | | | | 0.004** | |
| | | | (0.062) | | | | (0.575) | | | | (0.030) | | | | (0.030) | |
| IMR× DPPPE | | | | 0.006 | | | | -0.004* | | | | -0.003 | | | | -0.0091 |
| | | | | (0.672) | | | | (0.050) | | | | (0.269) | | | | (0.180) |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GFCF | 0.082*** | -0.215 | 0.760** | -0.0645 | 0.0522 | -0.005 | -0.028 | 0.098 | -0.010 | 0.0192 | -0.0017 | 0.006 | -0.006 | 0.0324 | -0.0103 | -0.0199 |
| | (0.006) | (0.600) | (0.035) | (0.269) | (0.9496) | (0.039) | (0.363) | (0.168) | (0.014) | (0.724) | (0.014) | (0.192) | (0.266) | (0.273) | (0.323) | (0.511) |
| IRS | -0.515 | 0.150 | -1.136 | 0.094 | -0.098 | -0.023 | -0.027** | -0.045 | 0.067 | -0.013* | 0.017* | -0.0186 | -0.0375 | -0.1099 | -0.0243 | 0.0002 |
| | (0.230) | (0.253) | (0.167) | (0.434) | (0.940) | (0.308) | (0.019) | (0.160) | (0.140) | (0.055) | (0.069) | (0.108) | (0.731) | (0.760) | (0.167) | (0.610) |
| INFR | -0.0411 | -0.0504 | -0.0781 | -0.0200 | 0.0052 | 0.0027 | -0.0017 | -0.0034 | 0.0037 | 0.0023 | 0.0014 | 0.0048 | -0.0037 | 0.0003 | -0.0019 | 0.0188 |
| | (0.124) | (0.143) | (0.330) | (0.216) | (0.957) | (0.030) | (0.190) | (0.104) | (0.196) | (0.040) | (0.853) | (0.236) | (0.863) | (0.915) | (0.451) | (0.164) |
| TO | -0.1702 | 0.5278 | -0.9767 | 0.2018 | -0.0468 | -0.0210 | -0.0077 | -0.0232 | 0.0277 | -0.0060 | 0.0004 | -0.0284 | 0.0096 | -0.0847 | 0.0177 | 0.7371 |
| | (0.637) | (0.164) | (0.285) | (0.236) | (0.008) | (0.287) | (0.144) | (0.252) | (0.176) | (0.340) | (0.039) | (0.253) | (0.230) | (0.255) | (0.696) | (0.236) |
| Constant | -13.614 | -66.988 | -498.22 | 55.213 | -28.431 | 8.4933 | 6.6585 | 3.7874 | 2.2229 | -3.0055 | 6.7165 | -17.218 | 3.7955 | 18.005 | 7.4484 | 1.4112 |
| | (0.333) | (0.489) | (0.285) | (0.597) | (0.536) | (0.063) | (0.032) | (0.373) | (0.158) | (0.231) | (0.238) | (0.246) | (0.770) | (0.875) | (0.339) | (0.508) |
| AR(1) | 0.0019 | 0.0065 | 0.075 | 0.107 | 0.149 | 0.038 | 0.059 | 0.095 | 0.044 | 0.1963 | 0.0982 | 0.069 | 0.066 | 0.3428 | 0.0015 | 0.491 |
| AR(2) | 0.292 | 0.1536 | 0.758 | 0.643 | 0.9914 | 0.939 | 0.9997 | 0.575 | 0.9996 | 0.9963 | 0.9997 | 0.9992 | 0.756 | 0.945 | 0.595 | 0.9331 |
| Hansen | 0.3459 | 0.5833 | 0.4506 | 0.3925 | 0.3825 | 0.6146 | 0.5345 | 0.5158 | 0.5847 | 0.0079 | 0.2875 | 0.4957 | 0.4563 | 0.3575 | 0.3774 | 0.3952 |
| Obs | 700 | 715 | 715 | 715 | 710 | 715 | 715 | 715 | 710 | 715 | 715 | 715 | 710 | 715 | 715 | 715 |

**Note:** ***, ** and * indicate significance at 1%, 5% and 10% respectively.

**Source:** Author's computation (2023).

Table 4.2.4.2b depicted that the coefficient of first lagged of GDP per capita (GDPPCG) is positive (except in model 2) while model three is statistically significant indicating that the previous year of GDP per capita has a positive impact on the current year of GDP per capita. The first lagged of income equality exhibits positive coefficient in model one and four indicating that the previous year of income equality has a positive impact on the current year in model one while other two models exhibit negative coefficient but are not statistically significant. Further, we find evidence of positive and significant coefficient in the first lagged of employment for all the models. This implies that the previous year of employment has a positive impact on the current year of employment in all the models (column 9 to 12).

The coefficient value of 0.006 as indicated by the interaction term of primary school enrollment (PSE) and GDPPPE is not statistically significant concerning GDP per capita growth, while resulted to 2.1% increase in employment. However, PSE itself is statistically significant at 10% and positively associated with GDP per capita growth. This implies 1% increase in primary school enrollment (PSE) and GDPPPE resulted to 27.3%, 20.54%, and 6% increase in GDP per capita growth, income equality and employment respectively.

The results of joint effect of secondary school enrollment (SSE) and GDPPPE on GDP per capita, income equality, employment and inclusive growth index varies. The joint effect of secondary school enrollment (SSE) and GDPPPE on GDP per capita as well as on employment has a negative impact while statistically significant at 10% and 5% level respectively. On the magnitude, 1% increase in combination of secondary school enrollment (SSE) and GDPPPE resulted to 0.8% and 0.6% decrease in GDP per capita and employment respectively. This implies that secondary school enrollment, in terms of measured productivity per worker; appear not to be significantly increase per capita and employment. Also, the joint effect of secondary

school enrollment (SSE) and GDPPPE on income equality as well as on inclusive growth index has a positive impact while statistically significant at 5% and 10% level respectively. On the magnitude, 1% increase in combination of secondary school enrollment (SSE) and GDPPPE resulted to 0.7% and 0.2% increase in income equality and inclusive growth index respectively. This indicates that higher returns to education tend to have lower inequality in the wealth distribution.

The combination of life expectancy (LE) and GDPPPE, as indicated by the interaction term, is statistically significant concerning GDP per capita growth, employment and inclusive growth index. However, LE itself is statistically significant and negatively associated with employment. As its coefficient value of 0.142 implied that one percent increase in life expectancy (LE) resulted in 14% decrease in employment.

Additionally, gross fixed capital formation has significant and positive effect on GDP per capita growth, suggesting that 1% increase in gross fixed capital formation resulted to 8.2% increase in GDP per capita growth. This implies that growth in physical capital can spur output growth which could result from adequate government spending on education and infrastructure.

### 4.3 Discussion of Findings

The results from our first hypothesis in table 4.2.1.1b and table 4.2.1.2b. Table 4.2.1.1b presents the empirical results of the effects of input factor of human capital development on the inclusive growth. The three notable results are disclosed as follows. First, the impact of government expenditure on education on GDPG per capita and income equality; government expenditure on education had a positive and statistically significant impact on GDPG per capita and income equality. This finding supports the theoretical notion that investments in education have positive effect on income equality by providing individuals with skills and opportunities for higher-

paying jobs. Likewise, the positive effect of government expenditure on education (GEE) on income equality underscores the role of education in decreasing income disparities[2]. Education equips individuals with skills that can lead to higher incomes and reduce income inequality.

Second, government Expenditure on Health (GEH) had a negative and statistically significant impact on GDPG per capita and income equality. The negative impact of GEH on income equality indicating that, limited access to healthcare contributes to income inequality. However, it positively impacts inclusive growth, highlighting the role of healthcare in fostering economic growth. This suggests that a 1% increase in government expenditure on health is associated with an increase of 3.2% in inclusive growth indicating that government expenditure on health is likely to have a significant impact on growth inclusiveness. This finding aligns with the empirical evidence on importance of government expenditure, which suggests that health outcomes influence human capital development[8].

Third, the marginal impact of gross fixed capital formation on inclusive growth reveals inadequate investment in infrastructure, potentially limiting its benefits to citizens. This finding contradicts conventional stance, which often emphasizes the importance of investment in physical capital for economic growth[11].

In Table 4.2.1.2b, we examine the impact of output factors of human capital development; three important findings are equally notable. First, primary school enrollment (PSE) has a positive effect on GDP per capita, suggesting government policies encouraging enrollment lead to higher income. This result aligns with previous research[3] [4.] Second, positive coefficient of life expectancy indicates significant impact on income equality, suggesting that life expectancy is a significant predictor of income equality. This finding aligns with other studies[5].

Third, infant mortality rate has a negative coefficient in GDPG per capita, income equality and inclusive growth with the p-value of 0.041, .0015 and 0.025 respectively. This suggests that a decrease in the infant mortality rate is associated with higher GDPG per capita, income equality and inclusive growth, underscoring the benefits of child health investment. Fourth, gross fixed capital formation has a positive effect on income equality and employment, indicating the potential for increased investment in fixed capital to promote these aspects. This finding is consistent with empirical studies that have demonstrated the positive relationship between physical capital productivity and poverty reduction[9].

Further, the uniqueness of our findings is on input indicator of human capital and how it affects labour productivity. From table 4.2.3.2, the following findings can be discerned. We affirm the two input indicators of human capital (government expenditure on education and government expenditure on health). Thus, input indicators of human capital development positively influence labor productivity, suggesting that increasing expenditure in these areas enhances productivity. This finding aligns with previous research on the provision of education and healthcare infrastructure[6].

More also, the estimated parameter shows that GDP per person employed significantly affects GDP per capita and employment, reflecting labor productivity's impact on job creation. The results further show primary school enrollment and life expectancy positively affect labor productivity, indicating that these factors are found to be more effective in driving labour productivity, contributing to higher workforce participation rates and economic productivity. The finding is consistent with theories highlighting the role of education in driving economic productivity[10].

The results of the other covariates that served as control variables are worth discussing. In line with previous studies, access to domestic credit facilities is an enabler for creation of jobs and capacity building, and income equality[7]. The findings also provide evidence for the interest rate spread suggesting that wider interest rate spread drive employment which in turn fosters shared prosperity. Additionally, trade openness shows positive coefficient and significant effect on GDPG per capita and income equality. For every 1% increase in trade openness, GDPG per capita and income equality tends to increase by 29.67% and 0.02% respectively. This implies that particularly, with enhance globalisation in the SSA region following the implementation of the AfCFTA, trade openness can foster commercial connectivity and information dissemination. This finding supports theories emphasizing the role of globalization and trade liberalization in promoting economic development[11].

We discuss the joint effects of government expenditure on education and health with GDPPPE on inclusive growth. The interaction of GEH and GDPPPE positively impacts inclusive growth, highlighting the synergy between healthcare and economic productivity. Although the joint effect of PSE and GDPPPE on employment is not significant, it underscores the importance of primary education for future skill development. Similarly, the joint effect of SSE and GDPPPE on income equality is not significant, indicating the influence of other factors or policies. However, the interaction between LE and GDPPPE positively impacts employment, emphasizing the role of health in labor force participation.

Furthermore, we discuss the joint effects of government expenditure on education and health with GDPPPE (labor productivity) on inclusive growth. The interaction of GEH and GDPPPE positively impacts inclusive growth, highlighting the synergy between healthcare and economic productivity. Although the joint effect of PSE and GDPPPE on employment is not significant, it

underscores the importance of primary education for future skill development. Similarly, the joint effect of SSE and GDPPPE on income equality is not significant; indicating the other factors or policies may play a more significant role in income distribution. The negative joint effect of SSE and GDPPPE on employment might be linked to skills mismatch and underemployment. However, life expectancy (LE) did not have a significant direct effect on employment, but the interaction between LE and GDPPPE positively impacts employment, emphasizing the role of health in labor force participation. Lastly, we observe that the positive impact of IMR on employment may be associated with the "demographic dividend" hypothesis, wherein reduced child mortality rates lead to a larger working-age population, potentially increasing the labor force and employment opportunities.

The study's findings diverge from previous research by providing comprehensive insights into the nuanced relationship between human capital development, inclusive growth, and labor productivity in Sub-Saharan Africa (SSA). The contribution of these findings include

1. Impact of Government Expenditure on Education and Health: The study reveals that while government expenditure on education positively affects GDP per capita and income equality, expenditure on health has a negative impact on income equality but positively affects inclusive growth. This underscores the complex interplay between healthcare accessibility, economic growth, and income distribution, highlighting the need for targeted policy interventions in both sectors.

2. Output Factors of Human Capital Development: Primary school enrollment, life expectancy, and infant mortality rate emerge as crucial determinants of economic outcomes. These findings emphasize the significance of early education, healthcare access, and child health investment in driving economic growth, reducing income inequality, and fostering inclusive development.

3. Impact on Labor Productivity: The study uniquely explores the relationship between input indicators of human capital development and labor productivity. It finds that government expenditure on education and health positively influences labor productivity. It suggests the importance of education and healthcare infrastructure in enhancing workforce productivity.

4. Joint Effects and Policy Implications: The study delves into the joint effects of government expenditure on education and health with GDP per person employed (GDPPPE) on inclusive growth and employment. It underscores the synergy between healthcare and economic productivity while emphasizing the role of primary education in future skill development. Additionally, the study highlights the potential impact of trade openness and access to domestic credit facilities on economic growth and income equality, providing valuable insights for policy formulation.

Overall, the study enriches the existing literature by offering comprehensive empirical evidence on the intricate dynamics between human capital development, inclusive growth, and labor productivity in SSA.

## Endnotes


1. S.O Akinbode., A.O Dipeolu., T.M Bolarinwa & O.B Olukowi. *Effect of Health Outcome on Economic Growth in Sub-Saharan Africa: A System Generalized Method of Moment Approach*. **Journal of Economics and Development**, 23(3), 2021, 254-266

2. T. Akinlo & O. Oyeleke. *Human Capital Formation and Economic Growth in Sub-Saharan African Countries: An Empirical Investigation.***The Indian Economic Journal,** 2(6),2020. 001946622097284–. doi:10.1177/0019466220972848

3. I. Oseni, S. O., Akinbode, A., Babalola, & B Adegboyega. *Government Spending and School Enrolment in sub-Saharan Africa: A system GMM approach*. **Journal of Economics & Management,** 40(2), 2020, 91-108.

4. Q.S Wang., Y.F Hua., R. Tao & N.C Moldovan. *Can Health Human Capital Help the Sub-Saharan Africa Out of the Poverty Trap? An ARDL Model Approach*. Frontiers in Public Health, 9, 2021,642.

5. R. A Mohamed., A.I Abd El-aziz., H.N Ramadan., M.H Abd El-sayed & H.A Emam. *Impact of Human Capital on Economic Growth in Egypt: An ARDL Approach*. **European Journal of Economics, Finance and Administrative Sciences,** 108, 2021.

6. A.B Dankyi., O.J Abban., K Yusheng & T.P Coulibaly. *Human Capital, Foreign Direct Investment, and Economic Growth: Evidence from ECOWAS in a Decomposed Income Level Panel*. Environmental Challenges, 9, 2022, 100602

7. Asian Development Bank. *Infrastructure for Supporting Inclusive Growth and Poverty Reduction in Asia*. Asian Development Bank, Working paper, Mandaluyong City, 2019**.** http://www.adb.org/sites/default/files/pub/2012/infrastructure-supporting-inclusive-growth.pdf.

# Chapter Five

# Conclusion

## 5.1 Summary of Findings

This study has delved into the intricate nexus among human capital development, labor productivity, and inclusive growth in Sub-Saharan African (SSA) countries. With a focus on empirical analysis using System GMM, data spanning from 1999 to 2021 was obtained for 32 SSA countries from WDI and ILO statistical database.

The study provides evidence robust to several specifications from the dynamic system GMM while examining the interplay between various input and output factors of human capital development, labour productivity and components of inclusive growth in Sub-Saharan African countries, the empirical analysis revealed that investments in human capital development, particularly government expenditure on education (GEE) and health (GEH), have a substantial positive impact on labor productivity in SSA countries. Moreover, factors such as secondary school enrollment (SSE), higher life expectancy (LE), and lower infant mortality rates (IMR) are closely associated with increased labor productivity. These findings underscore the pivotal role of education and healthcare in enhancing the efficiency and effectiveness of the labor force. It underscores the critical importance of investing in education and healthcare to drive economic progress and reduce income inequality, ultimately paving the way for a more inclusive and prosperous future for the region.

The Two-step system-GMM results showed that three out of the several measures of human capital employed (government expenditure on health, primary school enrolment as well as life expectancy) exert significant influence on labour productivity. While government expenditure on

health influences labour productivity positively, primary school enrolment is found to be more effective in driving productivity. Similar life expectancy also exerts posittive influence on labour productivity. Thus, human capital significantly contributes to labour productivity in SSA. Also, labour productivity exerts positive influence on GDPG per capita and employment but exerts negative influence on income equality and inclusive growth index.

The study also demonstrated a significant connection between human capital development and income equality. Specifically, government expenditure on education (GEE) emerged as a key driver of reduced income inequality in the region. Additionally, primary school enrollment (PSE) and secondary school enrollment (SSE) were identified as instrumental in decreasing income disparities. Moreover, higher life expectancy (LE) was found to be associated with lower income inequality, emphasizing the importance of health as an equalizer.

Inclusive growth, characterized by equitable distribution of the benefits of economic development, was found to be positively influenced by investments in human capital development. Government expenditure on education (GEE) was identified as a catalyst for inclusive growth in SSA countries. Furthermore, primary school enrollment (PSE) and secondary school enrollment (SSE) emerged as crucial factors promoting inclusive economic development. Improved health outcomes, as indicated by higher life expectancy (LE), were also linked to more inclusive growth.

Therefore, the findings offer critical insights that have significant implications for policymakers, development practitioners, and stakeholders seeking to foster sustainable growth and reduce income inequality in SSA. The study contributes to the understanding of how investments in education and healthcare impact both labor productivity and inclusive growth. The findings

provide valuable insights for policymakers seeking to design effective strategies to foster economic development and reduce income inequality in SSA.

## 5.2 Conclusion

Sub-Saharan Africa, despite its vast potential, has faced significant challenges in achieving sustainable economic growth and reducing income inequality. This study addresses these challenges by exploring the nexus among human capital development, labor productivity, and inclusive growth. Human capital, encompassing education, health, and skills, is recognized as a critical driver of economic progress. Labor productivity, on the other hand, determines the efficiency with which this human capital is utilized. Inclusive growth is the ultimate goal, ensuring that the benefits of economic development are distributed equitably across society.

The importance of human capital development in SSA countries with education and healthcare playing pivotal role in driving labor productivity, economic growth, reducing income inequality and fostering inclusive development. Improving access to education and enhancing healthcare systems and addressing income inequality are critical for the region's sustainable development. Policies that increase access to education and healthcare can enhance both productivity and income equality. Moreover, policymakers in the region should prioritize investments in education and healthcare to stimulate economic development and reduce income inequality.

## 5.3 Recommendations

The findings of this study have several policy implications for Sub-Saharan African (SSA) countries:

1. Sub-Saharan African (SSA) countries should prioritize increased government expenditure on education and healthcare, as indicated by the positive impact of these investments on labor productivity and income equality. This investment not only enhances labor productivity but also contributes to reducing income inequality and fostering inclusive growth.
2. Efforts should be directed toward ensuring universal access to quality education, with a particular emphasis on primary and secondary school enrollment. This approach can serve as a powerful tool for promoting both economic development and social equity, aligning with the positive findings regarding primary school enrollment.
3. Improving access to healthcare services and extending life expectancy should be central to development strategies. A healthier population not only contributes to labor productivity but also plays a pivotal role in achieving inclusive growth, in line with the study's results.
4. Beyond primary and secondary education, SSA countries should invest in vocational and technical training programs that equip individuals with the skills needed for the modern job market. This will enhance employability and boost labor productivity, consistent with the study's findings.
5. To address income inequality, SSA countries should implement targeted poverty alleviation programs. These initiatives should focus on providing support to vulnerable

and marginalized populations, ensuring that the benefits of economic growth are shared more equitably, in accordance with the findings.

6. Policymakers should adopt a long-term perspective when implementing these policies. Achieving meaningful progress in human capital development, labor productivity, and inclusive growth often requires sustained efforts over many years, as indicated by the findings.

7. Labor market reforms that promote flexibility and adaptability can lead to increased job creation. Policies that match job seekers with employers' needs and provide opportunities for skills development and retraining are essential.

8. Collaborative efforts among SSA countries can lead to the sharing of best practices and the development of regional strategies to address common challenges. SSA countries should actively engage in regional economic integration efforts. Regional integration can facilitate the movement of labor, goods, and services, trade agreements and cooperation which can expand markets, attract investment, create opportunities for specialization and diversification, and fostering economic growth.

## 5.4 Contributions to Knowledge

The following major contributions are stated below:

a) The study decomposes inclusive growth into its essential components. Notably, the study places a particular emphasis on the multifaceted nature of inclusive growth, dissecting it into income growth, income equality, and employment dimensions. This decomposition offers a comprehensive perspective on the drivers and dynamics shaping the inclusive growth trajectory in SSA.

b) The study applies the Principal Component Analysis (PCA) to generate a comprehensive Inclusive Growth Index. The utilization of PCA as a methodological tool allows for the integration of multiple dimensions of inclusive growth, including income growth, income equality, and employment, into a unified and robust metric. The Inclusive Growth Index derived from PCA serves as a comprehensive and parsimonious measure, facilitating more nuanced analyses and policy discussions.

c) The research advances the field by intricately dissecting human capital development into both input and output factors. By examining input factors such as government health expenditure and public education expenditure, the study provides insights into the policy dimensions influencing the development of human capital in the region.

d) Furthermore, the decomposition of human capital development into output factors, including primary school enrolment, secondary school enrolment, life expectancy, and infant mortality rate, unveils a distinct understanding of the tangible outcomes associated with investment in human capital.

## 5.5 Suggestion for Future Studies

While this study offers critical insights, future research can delve deeper into several areas:

1. SSA is a diverse region with varying levels of development. Future studies can explore regional variations in the relationships examined here and tailor policy recommendations accordingly.
2. Investigating the role of gender in human capital development and its implications for labor productivity and inclusive growth can provide valuable insights into addressing gender disparities.
3. Examining the long-term impact of human capital development on labor productivity and inclusive growth is crucial. Future research can track the progress and outcomes of individuals who have benefited from education and healthcare investments over several years. This longitudinal approach can reveal the sustained effects and the importance of continuous investment in human capital.
4. Comparative studies with regions outside SSA can provide valuable insights into the unique challenges and opportunities faced by SSA countries. Understanding how SSA compares to other regions in terms of human capital development and its impact on labor productivity and inclusive growth can highlight best practices and areas for improvement.

## Bibliography

### Journals


Adedeji, A. *Inclusive Growth, Human Capital Development and Natural Resource Rent in SSA*. **Economic Change and Restructuring,** 51(1), 2018, 29–48. https://doi.org/10.1007/s10644-016-9193-y

Adeleye, B., Bengana, I., Boukhelkhal, A., Shafiq, M & Abdulkareem, H. *Does Human Capital tilt the Population-Economic Growth Dynamics? Evidence from Middle East and North African countries.***Soc Indic Res,** 162(2), 2022, 863–883. doi: 10.1007/s11205-021-02867-5.

Akinbode, S., Dipeolu, A., Bolarinwa, T & Olukowi, B. *Effect of Health Outcome on Economic Growth in Sub-Saharan Africa: A System Generalized Method of Moment Approach.* **Journal of Economics and Development**, 23(3), 2021, 254-266

Akinola, G & Mbonigaba, J. *Human Capital in the Sub Saharan African Countries: Productivity and the Policy Implications* **AUDOE**, 15(1), 2019, 163-189.

Alekhina, V & Ganelli, A. *Determinants of Inclusive Growth in ASEAN*. ***Journal of the Asia Pacific Economy*****,** 2021. Available at https://doi.org/10.1080/13547860.2021. 1981044A

Andrian, T *"Unemployment, Education, Poverty, and Inclusive Growth": Evidence from Provinces in Indonesia* .**Article in International Journal of Psychosocial Rehabilitation**, 2020.

Arellano, M & Bond, S. *Some Tests of Specification for Panel Data: Monte Carlo Evidence and An Application to Employment Equations.* **The Review of Economic studies**, 58(2), 1991, 277-297.

Azenui. N & Rada, C. *Labor Productivity Growth in Sub-Sahara African LDCs: Sectoral Contributions and Macroeconomic factors. Structural Changes Economic Dynamics*, 56, 2021, 10–26.

Barkhordari, S., Fattahi, M., & Azimi, A. *The Impact of Knowledge-Based Economy on Growth Performance: Evidence from MENA countries*. **Journal of the Knowledge Economy** 10, 2019, 1168–82.

Becker, G., Murphy, K & Tamura, R. *Human Capital, Fertility, and Economics Growth.* **Journal of Political Economy**, 5(98), 1990, 12-37.

Becker, G.S. *Investment in Human Capital: A Theoretical Analysis*. **The Journal of Political Economy,** 1962, 9-49.

Bernard, S & Edward, N. *Financial Inclusion and Inclusive Growth in Sub-Saharan Africa*. **Cogent Economics & Finance**, 10(1), 2022, 205-734.

Bloom, D., Canning, D., & Sevilla, J. *The Effect of Health on Economic Growth: A Production Function Approach*. **World development,** 32(1), 2004, 1-13.

Bruhn, S., Grebel, T & Nesta, L. *The Fallacy in Productivity Decomposition*. **GREDEG Working Papers Series**, 39, 2021.

Campbell, A & Ojo, I *"Human Capital and Poverty in Nigeria"***Working Paper in Progress 2021.**

Campbell, A & Aderinto, E. *Human Capital Development and Labour Market Outcomes in Africa: Evidence from Sub-Saharan African Countries*. **Journal of Economics and Sustainable Development**, 13(6), 2020.

Chikalipah, S & Okafor, G.*Dynamic Linkage Between Economic Growth and Human Development: Time Series Evidence from Nigeria*. **Journal of International Development,** 31(1), 2019, 22-38

Dixit, S., Satya, N., Mandal, A., Sawhney, A., & S. Subhav. *Relationship between Skill Development and Productivity in Construction sector: A literature Review*. International **Journal of Civil Engineering and Technology**, 8(5), 2017, 649–65.

Ezaal, O & Owede, V. *Human Capital Development and Labour Productivity in Nigeria, 1980-2016*. **Australian Research Journal of Humanities, Management and Social Sciences**. 11(1), 2019.

Forbes, M., Barker, A & Turner, *The Effects of Education and Health on Wages and Productivity*. Productivity Commission Staff Working Paper. **Australian Government Productivity Commission**, 2021.

Gruzina, I. Firsova & W Strielkowski. *Dynamics of Human Capital Development in Economic Development Cycles*. **Economies. 9(2),** 2021, 67- 87.

Hippe, R . *Human Capital in European Regions since the French Revolution: Lessons for Economic and Education Policies*. **Revue d'économie politique**, 130(1), 2020, 27-50.

Howell, D & Wolff. E. *Trends in the Growth and Distribution of Skills in the U.S. Workplace, 1960-1985*. **Industrial and Labor Relation Review 2**(44), 1991, 486-502.

Inglesi-Lotz, V & Toit. *The Evolution and Contribution of Technological Progress to the South African Economy: Growth Accounting and Kalman Flter Application*. **Applied Econometrics and International Development,** 14(1), 2019.

Jalles, J & de Mello. *Cross-country Evidence on the Determinants of Inclusive Growth episodes*. **Review of Development Economics**, 23(4), 2019, 1818–1839.

Joseph, T & Obikaonu, P. *Economic Growth and Quality Adjusted Human Capital Equation: Moderating Role of Social Capabilities in Africa*. **Applied Journal of Economics, Management and Social Sciences,** 2(2), 2021,1–9. https://doi.org/10.53790/ajmss.v2i2.19

Korkmaz, S & Korkmaz, O. *The Relationship between Labor Productivity and Economic Growth in OECD Countries*, **International Journal of Economics and Finance**; 9(5), 2017.

Kotsantonis, S. & Serafeim, G. *Human Capital and the Future of Work: Implications for Investors and ESG integration*. **Journal of Financial Transformation**, 51(2), 2020, 115–30.

Kpognon, K & Mamadou, B. *Does Institutional Quality Contribute to Increasing Labour Productivity in Sub-Saharan Africa?* An Empirical Analysis. Pan African University, 2020.

Lee, N. *Inclusive Growth in Cities: A Sympathetic Critique*. **Regional Studies**, 53(3), 2018, 424–34.

Li, H., P. Loyalka, S. Rozelle, & B. Wu. *Human Capital and China's Future Growth*. **Journal of Economic Perspective**s 3, 2017, 25–48.

Mačiulytė-Šniukienė, A. & Matuzevičiūtė. *Impact of Human Capital Development on Productivity Growth in EU Member States*. **Business, Management and Education**, 16(1), 2018, 1–12.

Mamdouh, A.M & Abdelsalam, M. *Education and Human Capital on Inclusive Growth in Egypt During period 1990-2020*. Econometrics Study**,** 1(2), 2022, 1-26.

Mamoloko, F., Rangongo, C & Ngwakwe, C . *Human Capital Investment and Economic Growth: A Test of Endogenous Growth Theory in Two Developing Countries*. **ACTA Universitatis Danubius** 15(1), 2019.

Marginson, S. *Limitations of Human Capital Theory*. **Studies in Higher Education** 44, 2019, 287–301.

Mastromarco, C & Simar, L . *Latent Heterogeneity to Evaluate the Effect of Human Capital on World Technology Frontier*. **Journal of Productivity Analysis** 55(1), 2021, 71–89.

McGillivray, M & Clarke, M. *Fairness in the International Allocation of Development Aid*. **The World Economy**, 41(4), 2018, 1068–1087.

Mitra, A & Das, D. *Inclusive Growth: Economics as if People Mattered*. **Global Business Review.** 19(3), 2019, 756–770.

Muhammad, E. *Labour Force Participation and Economic Growth in Nigeria*. **Advances in Management & Applied Economics**, 10(1), 2020, 1-14.

Munir, F & Ullah. S *Inclusive growth in Pakistan: Measurement and Determinants*. **The Pakistan Journal of Social Issues,** 6(6), 2018, 150–162.

Mutiu, A., Abdulfatai A., Adedeji, A & Onitekun, O. *Human Capital, Innovation, and Inclusive Growth in Sub-Saharan African Region*, **Economic Analysis and Policy**, 72, 2021, 609-625.

Ngepah, N., Saba, C & Mabindis, N. *Human Capital and Economic Growth in South Africa: A Cross-Municipality Panel Data Analysis*. **South Africa Journal of Economic. And Management Sci**. 24 (1), 2021, 1–11.

Nwambuko, T . *Human Resources Management and Capacity Building: A Pragmatic Approach to Sustaining Microfinance Institutions in Nigeria.* Conference on Microfinance and Enterprise Development Selected Conference Papers, Benin City, Edo State, Nigeria. 2019, 31-35.

OECD, *The Productivity Inclusiveness Nexus.* Meeting of the OECD Council at Ministerial Level, 2016

Ohanyere, C.P., Atueyi, C.L & Angela, O.L. *Impact of Human Capital Development on Economic Sustainability in Nigeria.* **International Academy Journal of Business Administration Annals,** 7 (1), 2019, 68-77

Okowa, E & Vincent, M. O. *Human Capital Development and Labour Productivity in Nigeria*. **Australian Research Journal of Humanities, Management and Social Sciences** 11(1), 2019, 142-155.

Olarewaju, F., Areo, A., Ogundipe, S., Ogunbiyi, T. & Asaleye, A. *Capital and Labour Productivity: A Comparative Study of Nigeria and South Africa*. **AsianEconomic and Financial Review**, 10(12), 2020, 1384-1395.

Ogundari, K & Awokusi, T. *"Human Capital Contribution to Economic Growth in Sub-Saharan Africa: Does Health Status Matter more than Education"?* **Economic Analysis and Policy**, 58, 2018,131-140.

Oseni, I., Akinbode, S. O., Babalola, A & Adegboyega, B . *Government Spending and School Enrolment in Sub-Saharan Africa: A System GMM Approach*. **Journal of Economics & Management,** 40(2), 2020, 91-108**.**

Osiobe, E. *A Literature Review of Human Capital and Economic Growth*. **Business and Economic Research**, 9, 2019, 179–196.

Oyinlola, M.A., Adedeji, A & Onitekun, O. *Human Capital, Innovation and Inclusive Growth SSA Region***. Economic Analysis and Policy**, 7(3), 2021, 609-625.

Oyinlola. M & Adedeji, A . *Human Capital, Financial Sector Development and Inclusive Growth in Sub-Saharan Africa*. **Economic Change and Restructuring**, 52(1), 2019, 43–66.

Owopet, A., Oyedele, O & Tella, S. *Human Capital Development and Inclusive Growth in Sub-Saharan Africa: The Case for Health*. **Applied Journal of Economics, Management and Social Sciences,** 5(1), 2024, 28–38. https://doi.org/10.53790/ajmss.v5i1.90

Pant, B. Shekar, M & Bagali. A. *Conceptual Analysis of the Theory of Human Capital: A New Dimension*. **Global J Comm Manage Perspect**. 11(1), 2022

Psacharopoulos, G & Patrinos, A. *Returns to Investment in Education: A Decennial Review of the Global Literature*. **Education Economics**, 26(5), 2018, 445-458.

Raheem, I., Isah, K., & Adedeji, A. *Inclusive Growth, Human Capital Development and Natural Resource Rent in SSA*. **Economic Change and Restructuring,** 51(1), 2018, 29–48.

Sarpong, B & Nketiah-Amponsah, E. *Financial Inclusion and Inclusive Growth in Sub-Saharan Africa*, **Cogent Economics & Finance**, 10(1), 2022, 2058734.

Schultz, T. *The Economic Importance of Human Capital in Modernization*. MPRA, 1993.

Sima, V., Georgiana, I., Subic, J., & Nancu, D. *Influences of the Industry 4.0 Revolution on the Human Capital Development and Consumer Behavior***. A systematic review. Sustainability**, 1(2), 2020, 4-35.

SIÉ, K. *Industrial Policy and Labour Productivity Growth in Africa: Does the Technology Choice Matter?* Economic Structures 12, 10, 2023. https://doi.org/10.1186/s40008-023-00305-y

Surya, B., Hadijah, H., Suriani, S., Baharuddin, B., Tenri, A., Menn, F & Rasyidi, E. *Spatial Transformation of a New City in 2006–20: Perspectives on the Spatial Dynamics, Environmental Quality Degradation, and Socio—Economic Sustainability of Local Communities in Makassar City, Indonesia*. Land, 9, 2020, 324.

Tasheva, S & Hillman, A. *Integrating Diversity at Different Levels: Multilevel Human Capital, Social Capital, and Demographic Diversity and their Implications for Team Effectiveness*. **Academy of Management Review** 44, 2019, 746–65.

Wang, Q, Hua, R. Tao, & N. Moldovan. *Can Health Human Capital Help the Sub-Saharan Africa Out of the Poverty Trap? An ARDL Model Approach*. **Frontiers in Public Health,** 9, 2021, 642.

Wang., X. Lin., H. Xiao., N.Bu & Li, Y. *Empirical Study on Human Capital, Economic Growth and Sustainable Development: Taking Shandong Province as an Example*. Sustainability, 14(12), 2022, 7221. doi: 10.3390/su14127221.

Wirajing, M., Nchofoung, T & Nanfoss, R. *Revisiting the Inequality-Well-being Nexus: The Case of Developing Countries. Global Social Welfare*. 2023 doi: 10.1007/s40609-023-00278-7.

World Bank. *World Development Report*. The Changing Nature of Work, 2019.

Yeo, Y & Lee, J. *Revitalizing the Race between Technology and Education: Investigating the Growth Strategy for the Knowledge-based Economy based on a CGE Analysis***.** Technology in Society 62, 2020, 101-295.

**Online Sources**

AFDB. *Measuring Inclusive Growth: From Theory to Applications in North Africa* 2016. Available at www.afdb.org

African Development Bank (AFDB). *Africa's Economic Growth to Outpace Global Forecast in 2023-2024* – African Development Bank Biannual Report, 2023

African Development Bank *"Human Capital Development"*. ADB, 2022. Available at https://www.afdb.org/fr/topics-and-sectors/human-capital-development

African Development Bank"*African Economic Outlook 2020*. Developing Africa's Workforce for the Future, 2020.

Business Development Bank of Canada (BDC). *Labour productivity*, 2023. Available at https://www.bdc.ca/en/articles-tools/entrepreneur-toolkit/templates-business-guides/glossary/labour-productivity

Cleartax. *Labour Productivity,* 2023 available at https://cleartax.in/?utm_ref=undefined_pages_navbar

Economic Commission for Africa. *Africa Regional Forum on Sustainable Development*. Fifth session Marrakech, Morocco, 2019, 16–18.

Gandhi. D. *Africa in Focus: Figures of the week: Diverging Trends on Income Inequality in Sub Saharan Africa*. Brookings, 2019.

Gov.Scot. *Inclusive Growth: What Does it Look Like? Economic Development Directorate. Part of Economy, Equality and rights*. MPRA,2022. Available at https://www.gov.scot/publications/inclusive-growth-look/#page-top

GradesFixer. *Human Resource Development*. 2021, from https://gradesfixer.com/free-essay-examples/human-resource-development/

Huang, Y & G. Quibria. G. *The global Partnership for Inclusive Growth* (no. 2013/059). WIDER Working Paper, 2022 Available at http://hdl.handle.net/10419/81052

International Labour Organization (ILO). *World Employment and Social Outlook*: Greening with Jobs. International Labour Office, 2018.

Karamabakuwa. T., Ncwadi, R & Phiri. A. *The Human Capital-Economic Growth Nexus in SSA Countries: What Can Strengthen the Relationship*? MPRA, 2019. Available at https//:mpra.ub.uni-muenchen.de/95199.

Kpognon, K. & Mamadou, B. *Does Institutional Quality Contribute to Increasing Labour Productivity in Sub-Saharan Africa? An Empirical Analysis.* Pan African University, 2020. athttps://mpra.ub.uni-muenchen.de/98674/ MPRA Paper No. 98674.

Nicholas Ngepah, *A Review of Theories and Evidence of Inclusive Growth: An Economic Perspective for Africa*. For: COSUST 2021 Special Issue on 'Inclusive Development

OECD. *Inclusive Growth. Centre on Well-being, Inclusion, Sustainability and Equal Opportunity* (WISE), 2023. Available at https://www.oecd.org/inclusive-growth/

OECD. *Innovating Education and Educating for Innovation: The Power of Digital Technologies and Skills*. OECD Publishing, Paris 2016. Available at http://doi.org/10.1787/97892642655097-en

OECD. *Promoting Productivity for Inclusive Growth in Latin America*. Better Policies Series, 2016.

OECD. *The Economy of Wellbeing*: Remarks by Angel Gurría, 2019. Available at https://www.oecd.org/about/secretary-general/the-economy-of-well-being-icelandseptember-2019.htm

Reserve Bank of Australia. *Productivity.* In Education, 2023. Available at https://www.rba.gov.au/

Scottish Government. '*Wellbeing Economy Governments*: WeGo, 2021. Available at https://www.gov.scot/groups/wellbeing-economy-governments-wego/

Taylor, S.A Greenlaw, E. Dodge & Sonenshine, R. *Principles of Economics*. US: Rice University,Open Stax. 2019.

Tobias Knedlik. *Sustainable Development Goal Nine and African Development: Challenges and Opportunities.* LIT Verlag Munster, 2021. Available at https://books.google.com/books?id=O3hMEAAAQBAJ

U.S. Bureau of Labor Statistics. *What is Productivity? Labor Productivity*, 2023. Available at https://www.bls.gov/k12/productivity-101/content/what-is-productivity/what-is-

UNESCO "*Funding Skills Development, the Private Sector Contribution."* Paris: UNESCO 2018. Available at: https://unevoc.unesco.org/go.php?q=Publications+ UNEVOC&lang=en&null=&null=&akt=id&st=&qs=6098

World Bank Blogs: *Where the Extreme Poor live*, 2020. Available at https//bogs.worldbank.org/opendata/where-the-extreme-poor-live

World Bank Database. *Government Expenditure on Education, total (% of GDP), 2023*.

World Bank. Poverty and Equity Databank, 2020. Available at https://databank.worldbank.org/source/poverty-and-equity

World Bank. *The Human Capital Project*. World Bank, 2018. Available at https://openknowledge.worldbank.org/handle/10986/30498

World Bank. *World Development Report. The Changing Nature of Work*. World Development Indicators Databank, World Bank, 2019. Available at https://databank.worldbank.org/source/world-development-indicators

World Bank. World Development Report. *The Changing Nature of Work*, 2019.

World Bank: *Sub Saharan African Growth Slows Amid Ongoing and New Economic Shocks*. Press Release, 2022.

World Development Indicators Databank. World Bank, 2020. Available at https://databank.worldbank.org/source/world-development-indicators

**Textbooks**

Becker, G *"Human Capital–A Theoretical and Empirical Analysis Human Capital–A Theoretical and Empirical Analysis*, Published on Labour Economic & Labour Relations", ed, 1975.

Becker, G. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education. Chicago*: University of Chicago Press, 1964.

Campbell, A. O . *Investment in Human Capital for Inclusive Growth: Limitata or Illimitata Accessum to Sustainable Development.* Lead City Univsersity, Ibadan, 12th Inaugural Lecture, 2021.

Chang, H. *Economics: The User's Guide: A Pelican Introduction*. United Kingdom: Penguin Books 2014

Datta, S. *The Economist: Economics: Making Sense of the Modern Economy*. United Kingdom: Economist Books, 2011.

Gandhi, D "*Africa in Focus: Figures of the week: Diverging Trends on Income Inequality in Sub Saharan Africa"* . Brookings, 2019.

**Theses**

Anumudu. C *The Impact of Human Capital on Labour Productivity in Manufacturing Industries in Enugu and Anambra States, Nigeria.* Being a Ph.D. Thesis Dissertation Submitted to the Department of Economics, Faculty of Social Sciences, University of Nigeria, Nsukka, in Partial Fulfillment of the requirement for the degree of Doctor of Phil, 2020.

Baruwa. O. *Institutional Quality, Financial Development and Inclusive growth in Nigeria*. Award of Doctor of Philosophy (PhD) in Economics, Lead City University, Ibadan , Oyo State, Nigeria, 2022.

Kgwaridi B.M. *The Relationship between Labour Productivity and Economic Growth in South Africa from 2000-2016.* A Research Report Submitted to the Faculty of Management, University of the Witwatersrand, in the field of Public and Development Management April 2017.

Mandlebe. W, " *Human Capital and Inclusive Growth" :A Case Study of Botswana.* Doctor of Philosophy (PhD), Walden University, 2014.