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Investigating the Effect of Public Debt on Capital Formation Across the Sub-Saharan African Countries via the Theoretical and Empirical Lens of Dual Gap and Financing Gap

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Abstract: This study examines a conceptual analysis of the relationship between public debt and capital formation among the Sub-Saharan African (SSA) countries, respectively. Specifically, public debt and domestic debt as well as external debt serve as a meant to an end that all SSA economies must contend with. Over the periods of pre-, during and post-debt relief from 1980 to 2020 of public debt stocks in the SSA region, the macroeconomic indicators have demonstrated unfavorable connections among and between all variables of interest in these nations. The dual gap hypothesis, finance gap theory, and their corresponding economic repercussions often have major negative effects. The analysis demonstrates that it has caused a negative influence on capital formation that is one of the crucial macroeconomic factors for sustained investment growth and economic development.

Keywords: Capital Formation; Dual Gap; Financing Gap; Public Debt; Sub-Saharan African.

1. Introduction

The study is concerned with public debt and its impact on capital formation through both domestic and external debt stocks. According to Hooley, Mugnier, Tamene and Togo (2021), public debt, which is the total amount of debt stocks of the government in both external and domestic debt, can be borrowed to close the gap in excess public expenditure over its total revenue payment. Capital formation is the process of accumulating considerable funds for valuable investments, wealth expansion, or the production of new wealth. Public debt is generally viewed as the primary cause of the enormous deficit gap in the economy, which at present is 63 percent of SSA's GDP (World Economic Outlook Database, 2021; Heitzig, Ordu, & Senbet, 2021). This is true even though other sources of revenue payment, in particular revenue from taxation, are also intended to carry such capacities. According to Coulibaly, Gandhi, and Senbet (2019), the SSA economy's public debt structure has gradually grown and deeply integrated. Capital formation is crucial for economic growth and development. Bridging fiscal deficits via the use of debt stock is essential for enhancing national savings and stimulating investment growth. Capital formation is a significant fund that directly improves financial development and growth. Accumulation of capital fund stock is essential for promoting investment growth. As more capital funds are available, financial institutions improve, thus leading to increased income, savings, and investment (Sachs, 2002). After a given degree of development in savings and investment, available funds will be sufficient to support a capital formation that will be required for the growth and development of an economy. This study is subsequently aimed at understanding how does capital formation influence the SSA economy through debt stock. The theoretical review and empirical literature are discussed in the following section. The third section examines the SSA's public debt and its impact relationship

with capital formation, while the last section of the paper sums up and concludes upon the review on public debt in SSA that has truly discredited the requirement for a stronger economy within the regional bloc.

Theoretical Review

Theoretical frameworks suggest that developing nations acquire public debt that increases capital accumulation and growth. This debt improves investment through capital formation and economic expansion (Hameed, Ashraf & Chaudhary, 2008). Neo-classical economics theory suggests that debt fills the saving-investment gap, raising capital formation volume and reflecting economic growth. Developing countries fill the domestic saving rate deficit, motivating production and export quota contribution to global output (Pattillo, Poirson & Ricci, 2002). Emerging and developing nations face a saving-investment gap in their domestic economies, thereby reducing capital formation and investment growth. External resources are needed to bridge this deficit for improved capital formation and economic growth.

Dual Gap Theory

Debt stock positively impacts capital fund availability and investment growth, but it gradually fades as it reaches a specific level. This is due to one-overlay as developing nations face limited capital formations and see a relief in acquiring more debt to improve production and output. This is because the turnover from principal capital is higher than interest rate coupons, allowing for more debt to be acquired (Pattillo, Poirson & Ricci, 2004). Debt and capital formation are often a topic of debate in panel data analysis and cross-country investigations. Khan and Knight (1981, 1982) suggest that expansionary fiscal policy through debt financing can stimulate capital formation to stabilize the saving-investment gap in the real sector economy. Blejer and Khan (1984) and Ajayi (1994) recommend that capital formation should be reflected in government fiscal policies for long-term improvement and short-term adjustment strategies. Harrod's dual gap theory (1939) identifies the need for efficient capital formation for growth in developing nations' free market economies. This theory is based on the dual gaps of savings-investment gap and export earning-imports spending. Sachs (2002) and Hunt (2007) formalized this theory, stating that developing nations face inadequate capital formation, resulting in weak investment growth and development due to poor income-saving mechanisms and inadequate reserve funds. Savings and investment through capital formation stimulate growth, as Sachs (2002) suggests. To maintain growth and efficient investment, the frequency of capital formation must reach at a certain edge point. Debt stock stimulates capital formation and investment, invigorating economic growth and development through increased total savings and capital formation over time. The dual gap model impacts capital formation and growth in developing nations through saving-investment deficits and trade deficits. To achieve growth, the public sector must invest in infrastructure to support domestic production and industrialization. The trade gap debate among policymakers, investors, and economists can improve capital formation and growth. However, developing nations must fill this trade imbalance deficit with productive capital formation through debt. Pattilo, Poirson, and Ricci (2004) found that public debt becomes a burden, reducing output growth and negatively impacting capital formation and total factor productivity. This negatively impacts productivity growth and the economy's total output. The burden also reduces investment growth due to decreased accessibility of capital formation, which is affected by principal debt stock payments and debt servicing. Were (2001) contributed to dual gap theory by stating that deficit gaps in income and consumption in developing and emerging economies lead to low saving and capital formation, resulting in poor investment growth? The theory encourages debt stock formation for enhanced investment, stimulating growth rates. The dual gap hypothesis, proposed by Ajab and Audu (2006), suggests that capital formation deficiencies in emerging and developing economies are primarily due to weak export earnings and foreign exchange rate fluctuations. This theory suggests that debt stock should form the necessary capital fund for productive capacity and efficient investment development.

Domestic and external debt stocks can influence capital formation through private income and savings in the economy. The relationship between public debt and capital formation has mixed effects, with some studies showing negative effects and others showing mixed results. Krugman (1988) argues that the overall impact is equivocal due to the frequency of public debt stock increasing, leading to capital flight from deficit countries to surplus economies, reducing the threshold for efficient investment and economic growth. Krugman (1988)

suggests that when public debt accumulates as a burden in an economy, investors expect low turnover on investment proceeds. This is because the government raises more taxes to repay debt principal and coupon, reducing saving-investment flow and capital formation, and slowing economic growth. Other trade gaps of dual gap theory include the work of Chenery and Strout (1966), Serieux and Samy (2001), and Pattilo, Poirson, and Ricci (2004). Dual gap theory suggests that developing nations' trade gaps are caused by weak export gains over strong import spending, creating a deficit in trade. This imbalance between import spending and export earnings creates a deficit in trade. Trade relations in developing economies heavily depend on natural resources and agriculture commodities with low prices and poor quality at the international commodity market. In developed economies, finished products with higher industrial prices include capital and consumer goods, providing value chain and employment opportunities. However, developing countries face trade deficits due to cost and quality discrepancies, resulting in trade deficits. Similarly, Chenery and Strout (1966) and Hameed, Sarwar, Mushtaq and Ali (2020) view it as cost and quality differential caused poor per capita income as well as the high frequency of debt incurred by developing countries. The theoretical review analysis suggests that public debt can negatively impact capital formation in an unproductive base economy. The trade gap debate among policymakers, investors, and economists reduces capital formation and growth. To address this deficit, developing nations must fill the trade imbalance deficit with investible capital formation through productive debt stock.

Financing Gap Theory

The financing gap theory explains the relationship between external debt and capital formation, based on Domar's hypothesis that foreign debt bridges the financing gap between capital funds and investment requirements. This theory has been confirmed by Easterly (1999), who highlights the connection between capital funds for investment and overall economic growth. The financing gap theory, developed by Rostow (1960), suggests that investment capital is closely related to external capital funds for economic growth. The theory emphasizes the stages of growth, "postulate that a country's transition from less developed to develop requires a sequence of events (Abdullahi, Hassan & Abu Bakar, 2016)." This perspective suggests a proportionate relationship between capital formation and economic growth. External debt stock bridges the gap between capital formation and investment growth in the economy. Rostow (1960) suggests that capital formation should be improved to stimulate investment by 100% of returns. External debt stock could help developing countries fill the required capital formation gap due to inadequate domestic capital funds for investment growth. Chenery and Strout (1966) studied Domar's financing gap theory suggests that capital formation can be enhanced by public debt in cases of deficiency between savings and investment capacity. However, Efendi (2001) suggests that high per capita income leads to a high consumption-saving model. Various studies such as Cunningham (1993), Suma (2007), Dougherty (2011), Khumalo (2018) and Ampah and Kiss (2019) have emphasized the need for capital formation to finance investment opportunities and impact growth through total savings. The overall impact is ambiguous. Financing gap theory suggests a direct connection between investment growth and domestic savings funds, and an indirect connection between capital formation and growth. It incorporates Keynesian assumptions and deficit financing components, assuming growth is directly related to capital formation through domestic savings levels. The financing gap theory is used in research studies to evaluate the financing gap in various economies. It assumes labor supply components are available, but capital formation is the main limitation to growth in investment and output (Effendi, 2001). Capital formation stimulates investment relative to growth rate, and growth is equal to investment divided by the incremental capital-output ratio. To estimate required investment, multiply the target with the incremental capital output ratio. The theory suggests that the gap between capital formation and investment financing to be bridged by using external debt. This would stimulate growth and development in developing nations. However, studies show that most external debt in Sub-Saharan Africa, since the 1950s, has not improved living standards or reduced income inequalities.

Empirical Review

Empirical literature suggests that public debt stock burden negatively impacts growth in both short term and long term by decreasing capital formation and productive investment. Agenor and Montiel (1996) suggests that excessive debt stock burden discourages investment growth, negatively affecting capital formation in the

economy. Consequently, too much debt stock burden discourages investment growth. Henceforth, this negatively influences capital formation in both the short run as well as the long run (Agenor & Montiel, 1996). Using a sample of developing countries, Eichengreen, Hausmann and Panizza (2005) investigated the relationship between domestic and external debt on capital funds in developing economies. They found that developing nations have short-term or long-term domestic debt in their markets. However, a time series analysis showed a long-run relationship between domestic debt, maturity, currency mismatch, and capital formation, while no long-run relationship was found between external debt, maturity, currency mismatch, and capital formation. Whajah, Bokpin, & Kuttu (2019) examine public debt, government size, and growth utilizing the panel data method for fifty-four African countries. Variables such as public debt, capital formation, trade openness, inflation, population growth, and labor productivity were used in their works. Among others, the results from the fixed effect model of the panel method disclosed that there is a negative relationship between public debt and capital formation. Also, their findings are observed to be reliable and consistent with the hypothesis of debt overhang theory. Hausmann and Panizza (2003) advocate a strong robust positive relationship between capital formation and domestic debt with a high correlation through monetary credibility. The findings of Hausmann and Panizza (2003) show a weak correlation between capital formation and external debt in emerging markets. Meanwhile, the findings of Mehl and Reynaud (2005) are found to contradict the results of Hausmann and Panizza (2003) that indicate a non-robust result due to the shortage of a smaller sample of time series and two nations with panel data techniques. Obinyeluaku (2013) emphasized that Sub-Saharan African countries comprise the regional blocs of West, South, East, and Central Africa using few panel techniques. Among others, Obinyeluaku (2013) found that government spending in SSA countries has surpassed revenue income. Aigheyisi (2013) and Chude and Chude (2013) apply both cross-sectional as well as panel studies in Africa to examine debt in public expenditure. Their findings show total government revenue is below aggregate spending, thereby indicating an increase in deficit expenditure in most African countries. Edwin, Ezinando, and Jeroh (2017) carried out a panel analysis study to examine public debt in the budget deficits of the government of Sub-Saharan Africa, using techniques of OLS and correlation analysis method. The study revealed positive relationship between public debt and revenue decline in SSA's government spending profiles. Also, their findings that SSA heavily over relied on debt finance expenditure gap of their budget deficits. Their findings in the study however contradict the results of Mayper, Granof and Mayper (1991) by showing that public debt is evidence that government revenue is not judiciously channeled in line with public priorities through budget processes in the long-term. That is public debt in budget deficits indicates a lack of judicious revenue channeling.

Dual Gap

The literature review highlights the linear impact of debt on capital formation, possibly due to domestic saving or total productivity growth. The connection between debt and stock-capital formations was conducted from various panel data methodologies. Hameed, Sarwar, Mushtaq and Ali (2020) carried out a study in seven South Asian economies namely Pakistan, Bangladesh, India, Sri Lanka, Bhutan, Nepal, and Maldives. They found an inverse relationship between debt and capital formation, and the same association was observed between debt servicing and capital formation. Using panel unit root and panel co-integration analysis, Hauner (2009) investigated the effects of public debt on capital formation and financial development in 79 developing and emerging countries. The results demonstrated that there is no causal relationship between the variables, however, there was a significant positive relationship between debt and capital formation. Baharumshah, Lau, and Khalid (2006) studied on the relationship between public debt and investment funds in Asian countries like the Philippines, Indonesia, Malaysia, and Thailand. They found a negative relationship between public debt and current account deficits, but a long-run relationship was found in Malaysia, Indonesia, and Thailand. The study of Serieux and Samy (2001) applied dynamic panel data technique and found a strong positive relationship between public debt and growth in 53 low-middle income economies through capital formation.

Financing Gap

Kocha, Iwedi, and Sarakiri (2021) investigated the dynamic impact of public external debt on capital formation in SSA using the PMG panel data. A weak short-run relationship between foreign debt and borrowing cost was

found in their works and a strong negative long-run relationship between external debts on capital formation. Public debt negatively impacts economic growth as demonstrated by Friedman (1983). Diamond (1965) suggests that public debt spreads stock from young to old, reducing saving-investment funds and capital formation in the short run and reducing capital-to-labor proportion. Cohen (1993) examines a theoretical model showing a non-linear effect of external debt on capital formation, with threshold effects. At the initial point, public debt has a positive effect on capital formation, but after that threshold point, it shows an inverse relationship. Aschauer (2000) suggests public debt is valuable for forming productive capital funds with positive outcomes up to a specific threshold and adverse relationships beyond that. Gong & Zou (2000) utilized an infinite-horizon framework by showing by mixed results on the relationship between external debt and capital formation. Long-term, external debt negatively affects capital formation, while short-run analysis shows a positive relationship between external debt and capital formation. Debt-productive financing increases capital formation, thereby decreasing debt accumulation. Abdullahi, Hassan and Abu Bakar (2016) found a negative long-run relationship between public external debt and capital formation growth. A unidirectional causality from debt to capital formation growth was found and subsequently argued that there is no bi-directional causal relationship between capital formation growth and public external debt. Specifically, the lack of a bi-directional causal relationship affects investment growth and development. Were (2001) found that Kenya's external debt positively impacts capital formation and private investment, but the cost of debt servicing hinders capital formation. Less-developed countries often rely on debt to improve their financial institutions and accelerate growth. This is due to inadequate domestic investment and weak national savings. To address this, they need resources to address the saving-investment gap caused by poor domestic revenue from primary commodities and natural resources. This can boost domestic revenue, improve income and aggregate consumption, and reduce the saving-investment gap through capital formation in the economy.

2. Conclusion and Recommendation

The study analyzes the relationship between public debt and capital formation. Most of the study findings suggest that public debt to serve as a means to an end for all countries. However, mixed results have been found on this path. A significant positive finding is the dual gap and financing gap on capital formation, which positively impacts the economy. This gap is a key macroeconomic indicator for improved investment, financial development, and sustained economic growth. This study explores the relationship between public debt and capital formation, focusing on the relationship between investment funds and capital formation. It begins with dual gap theory, which identifies the gap between domestic capital formation and the required capital fund for a productive economy. The financing gap theory, based on Domar's (1946) hypothesis, suggests that the gap between capital fund and investment requirements should be filled with debt stock from outside the economy to boost domestic economy and investment growth. This idea was further expanded by Chenery and Strout in 1966. This has further confirmed by Easterly (1999) who explained that there is a connection between capital funds for investment and the overall growth of the economy. This study explores the reasons behind increasing public debt in least-developed countries, focusing on capital formation and its relationship with debt stock. Public debt is a significant part of government expenditure in these nations, and capital formation is essential for productive venture capital. This stock of funds relates to investment development in a nation's genuine resources and involves borrowing debt stock. Accumulating cash flow is crucial for investment purposes, wealth expansion, and output creation, similar to McKinnon's (1973) theory of financial intermediation. It focuses on monetary extension and borrowing costs to stimulate investment and economic performance in least developed countries. Previous studies have shown that developing economies primarily accumulate debt as a productive base for their economic performance (Wang, 2009). This debt is accepted to improve capital formation and expand production based on the domestic economy (Hameed, Ashraf & Chaudhary, 2008). Neo-classical economists believed that increasing debt would lead to more output in a specific economy. However, this hypothesis suggests that capital movement can be facilitated by external resources for available debt. Debt stock motivates nations with a shortage of capital funds to acquire debt and contribute, as the rate of return is more significant than the institutional cost of borrowing (Pattillo, Poirson, & Ricci, 2002).

The dual gap model impacts capital formation and growth in developing nations through saving-investment deficits and trade deficits. To achieve growth, the public sector must invest in infrastructure to support domestic production and industrialization. The trade gap debate among policymakers, investors, and economists reduces capital formation and growth. To fill this deficit, developing nations need to fill it through debt stock and invest in infrastructure to support domestic production. Domestic and external debt stocks can influence capital formation through private income and savings in the economy. The relationship between public debt and capital formation has mixed effects, with some studies showing negative effects and others showing mixed results. Krugman (1988) argues that the overall impact is equivocal due to the frequency of public debt increasing, leading to capital flight from deficit countries to surplus economies, reducing the threshold for efficient investment and economic growth. Krugman (1988) suggests that when public debt accumulates as a burden in an economy, investors expect low turnover on investment proceeds. This is because the government raises more taxes to repay the debt principal and coupon, reducing saving-investment flow and capital formation, and slowing economic growth. Studies such as Cunningham (1993), Suma (2007), Dougherty (2011), Tchouassi and Ngangué (2014), Khumalo (2018) have explored the relationship between public debt and capital formation in SSA nations. These studies examine both external and domestic debt stocks, focusing on developing nations and SSA countries. The aim is to investigate starting points and develop strategies based on study outcomes. Obinyeluaku (2013) used panel techniques to investigate public debt and capital formation in using panel techniques across sub-regions of West, South, East, and Central SSA countries. The study reveals that SSA government spending has exceeded revenue over 33 years, causing public debt accumulation to negatively impact capital formation and economic growth. Aigheyisi (2013) and Chude and Chude (2013) conducted cross-sectional and panel studies to examine debt in fiscal deficit public expenditure. The results showed that total government revenue was below aggregate spending, indicating an increase in deficit expenditure in most African countries. The literature review on capital formation has been influenced by debates (Tchouassi & Ngangué, 2014). Debt stock is crucial for investment growth and economic development in emerging and developing nations (Youopoulos & Nugent, 1976). Bakare (2011) and Ugochukwu and Chinyere (2013) explain that capital formation is essential for investment growth. The available stock of capital formation enhances real sector performance in economies with high borrowing costs. Capital formation is often misunderstood as an investment, as it involves setting aside funds for value and growth, leading to wealth development (Ugochukwu, Judith & Edith, 2014; Ugochukwu & Chinyere, 2013). However, there are divergent views on investment, with gross private investment focusing on private interests within an economy and gross public investment being a government entity controlling public sector affairs. Strategic thinkers and policymakers generally believe that the connection between capital formation and growth is significant and positive (Beddies, 1999; Ghura & Michael, 1996; Ghura, 1997). Thus far, various studies have explored dual gap and financing gap theories, with some examining dual gap theory and others investigating financing gap theory. Key studies include Harrod (1939), were (2001), Serieux and Samy (2001), Sachs (2002), Pattilo, Poirson, Ricci (2004), Ajab and Audu (2006), and Hunt (2007). Meanwhile, other studies on financing gap theory include Domar (1946), Chenery and Strout (1966), Cunningham (1993), Easterly (1999), Efendi (2001), Suma (2007), Dougherty (2011), Khumalo (2018), and Ampah and Kiss (2019). Few researchers have explored the relationship between public debt and capital formation, specifically for sustainable growth. For example, Serieux and Samy (2001) found that debt negatively impacts capital formation, reducing private investment power and reducing growth. Major theories like dual gap theory, financing gap theory, and Keynesian theory report contradictory contentions in their theories.

Policy Implication

The study analyzes public debt's impact on capital formation in SSA nations and suggests policy measures to reduce the frequency of debt-driving economy. These include increasing capital formation, investing in productive sectors, minimizing budget deficits, and implementing import substitution and export diversification. Factors influencing public debt emphasize the need for a robust economy, better debt management measures, and cooperation among nations. Institutional frameworks, such as fiscal laws, inflation targeting, and financial supervision, may affect public debt composition in specific economy. Panel data model can help compare geographically and examine the link between macroeconomic variables and public debt in SSA nations.

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