EFFECT OF FOREIGN DEBT
ON LITERACY RATE IN KENYA

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Abstract:

This paper investigated the effect of foreign debt on the literacy rate in Kenya. In the fiscal year 2021/2022, public debt as a percentage of gross domestic product was 67 per cent, which was higher than the debt ceiling of 55 per cent of gross domestic product. External debt accounted for 52% of this total debt as of 2022, exhibiting a consistent increase since 2013, surpassing domestic debt. The burden of servicing foreign debt may subsequently pose a challenge to the government in fulfilling its commitments in the education sector. Consequently, lower literacy rates impede a nation's socio-economic progress as literacy is critical for promoting peace and adopting new technologies, both of which drive development. This study used the primary school completion rate as a proxy for literacy. Secondary data published in international and national organizations from 1990 to 2021 was employed for analysis. The study's theoretical framework was pegged on a consumer utility maximization of a merit-good education constrained by the government's financing. The relevant time series and diagnostic tests were performed on the data series and models. Auto Regressive Distributed Lag model was used for estimation using ordinary least squares. The findings were that foreign debt hurt the literacy rate in the long run and had a positive effect in the short run. The study recommends prudent management of foreign debt, so that it can facilitate improvements in the education sector.

JEL: I25; H63; O55; C22

Keywords: foreign debt, literacy rate, ARDL Model, utility maximization

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1. Introduction

The significance of education to human development cannot be overstated. The causal relationship between education and transforming an individual, community and a country's social economy is globally acknowledged. The primary objective of development, as written by Mahbub ul Haq in the first Human Development Report (1990), "*is to create an enabling environment in which people can enjoy long, healthy and creative lives.*" This implies that investment in human capital, education and health are critical towards improving the standard of living. The level of literacy may greatly influence an individual's success. According to the International Labour Organization publication in 2020, "*Education pays off, but you have to be patient.*" An educated person can better interpret his/her environment, fight for his/her rights, and indirectly improve the lives of others. Education, which is associated with higher literacy rates, can also increase employment possibilities in specialized fields (Gammarono, 2020). The Millennium Development Goals of the United Nations were to achieve universal primary education goals by the year 2015. The Sustainable Development Goals (SDG) Agenda four aims to achieve quality education, especially in sub-Saharan Africa, by 2030. The Social Pillar in Kenya's Vision 2030 contains education and training as critical pillars for achieving Vision 2030.

Article 53(1) (b) of the Kenyan Constitution guarantees every child a free and compulsory primary education. In contrast, article 55(a) mandates the government to implement measures that facilitate youth's access to education and training. In this study, education was a proxy for the primary school competition rate, which measures literacy. There has been no standard definition of literacy rate in scholarship. However, literacy rate can be defined as the percentage of the population that can read, communicate, write and count in a particular geographical area in an increasingly digital age (UNESCO, 2004; 2017; 2023).

Lower literacy rates may hinder a country's socio-economic progress, as literacy is critical in fostering peace and facilitating the adoption of new technologies, which are both essential for a nation's prosperity (Reder, 2010). In Sub-Saharan Africa and Kenya in particular, disparities persist between the literacy rates in men and women, underscoring literacy's important role in affirmative action initiatives. In addition, public debt in Sub-Saharan Africa is at an average of fifty five per cent of GDP, and some low-income countries are facing a debt crisis (Comelli, 2023). The pressure of debt servicing and other government obligations affect these governments' ability to finance the much-needed human rights to health, education and shelter. Against this backdrop, this paper aims to investigate the effect of foreign debt on the literacy rate in Kenya.

2. Foreign Debt in Kenya

In the past two decades, Kenya has increased public debt as a percentage of GDP. Public debt (% of GDP) has risen from 42% in the 2012/13 fiscal year to approximately 67% by the 2021/2022 budgetary year, registering a total debt stock of KSH 8.74 trillion. This is

above the debt ceiling proposed by the national treasury of 55% of GDP (Republic of Kenya, 2022). This signals that the current debt could be unsustainable. The overall debt has been from both external and domestic sources. Domestic debt is issued and repaid to creditors within the country using domestic currency. In contrast, foreign debt is borrowed from foreign lenders, and the loan repayment is denominated in the currency in which the loan was made. The Kenyan government's external debt is bilateral, commercial and multilateral debt. The share of external public debt increased when the government embarked on heavy infrastructural projects and borrowed to cater to budget deficits. The IMF and World Bank have a debt sustainability threshold of 55% present value (PV) for middle-income countries. This has been surpassed in Kenya, and the debt situation has also been exacerbated by the COVID-19 pandemic, where the government had to borrow to cushion businesses and support the recovery of the Kenyan economy. The increase in foreign debt beyond the required threshold has implications for HDI. Figure 1 presents foreign, domestic, and total debt as percentages of GDP and external and domestic debt as percentages of total debt in Kenya.

Figure 1: Foreign Debt and Domestic Debt as a % of GDP in Kenya
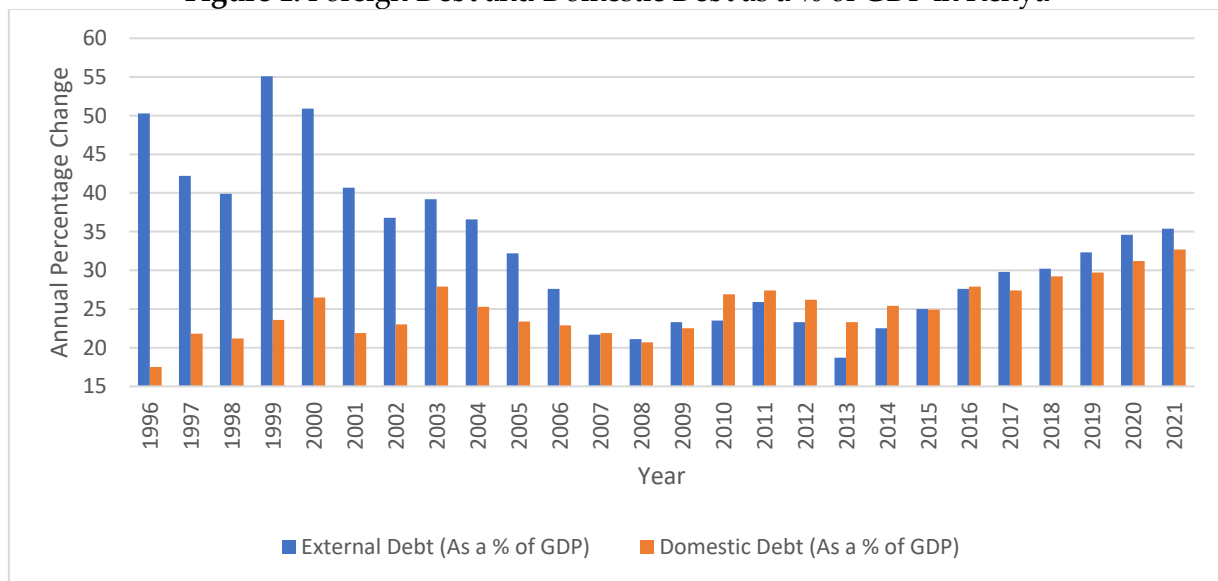
Source of Data: Kenya Annual Public Management Reports (Several Issues)

Figure 1 above shows a significant rise in external debt as a percentage of GDP since 2013. External debt surpassed domestic debt in 2016 and has since accounted for a larger share of total public debt at approximately 52% by 2022. This marked a switch in the public debt landscape where foreign debt surpassed domestic debt in 2016, and its impact on human well-being needs examination. In 2002, public debt stood at approximately 60 per cent of GDP when there was a political transition. Foreign debt contributed a larger share of this debt at 47 per cent of GDP in the same period. In Figure 1 above, in 1996, external debt as a percentage of GDP was 50.3 per cent, while domestic debt was 17.5 per cent in the same period. Foreign debt as a percentage of GDP was approximately 40 per cent months before the presidential campaigns in 2001. External debt as a share of GDP continuously declined from 2003 to 2013. Public debt was stable,

and the Kenya National Treasury financed a more significant portion of the annual budgets through revenues collected by taxation; hence, there was less reliance on the IMF and the World Bank by the government. External debt as a percentage of GDP declined from 39.2 per cent to 18.9 per cent from 2003 to 2013, respectively. Foreign debt as a percentage of GDP was also lower than domestic debt as a percentage of GDP, while total public debt was approximately 41 per cent of GDP by 2013. Foreign debt as a percentage of GDP declined to its lowest value from 2012 to 2013, recording 18.7%. Since 2014, there has been a reversal in the public debt trend, hence a general increase to approximately 67 per cent of GDP by 2022. The share of external debt as a percentage of GDP started to record higher percentages than domestic debt as a percentage of GDP from 2014 to 2022. Foreign debt has since overtaken domestic debt as a percentage of GDP, recording 37.9 per cent in 2021 against 32.7 per cent respectively. The burden of servicing this external debt affects the current and future generations if the uses of the debt cannot generate enough to repay the same.

In the years 2014 and 2021, domestic debt accounted for 25.4% and 32.7 % of GDP, respectively, while external debt accounted for 22.5% and 37.9% of GDP, respectively, in the same period. This was a departure from the situation in 2012, where external debt and domestic debt declined significantly by 23.6% and 26.2%, respectively, during the political transition. In the year 2021, foreign debt was approximately 52% of the total debt, representing a larger share of total debt in Kenya. This is due to growth in both external commercial and bilateral loans. The general trend of external debt as a percentage of GDP has increased with percentage fluctuations, as shown in Figure 1. This trend implies that Kenya is increasingly needing foreign currency for imports. The country is highly dependent on foreign currency, making its exchange rate highly prone to external shocks. Debt in foreign-denominated currency is risky, and excessive leverage leads to undue pressure on the exchange rate and monetary policy distress (National Democratic Institute for Economic Affairs, 2022).

The external borrowing is related to the increased demand for foreign-produced goods and services and decreased domestic production, including exports. When the country cannot generate adequate foreign reserves to facilitate the settlement of external debt, it is forced to borrow again to pay the maturing foreign debt obligations (National Democratic Institute for Economic Affairs, 2022). With it, the real effective exchange rate then takes an appreciating trend, therefore denying Kenya her initial access to foreign markets as domestic prices become more expensive and foreign prices become lower. This results in exports being stimulated, and the imports keep going up. This can put the country in a persistent state of external borrowing to pay for its imports.

Foreign debt is meant to achieve the economic development of a country with capital deficits and promote a better macroeconomic environment. However, Kenya's continuous increase in foreign borrowing has posed repayment challenges. Furthermore, the debt repayments that are made in foreign currencies put pressure on the country's foreign reserves, exchange rate, and the costs of inputs. In addition, the exports are not stimulated, and the imports keep on rising. Trade balance, consequently, is in deficit. The deficit is often financed through borrowing. According to a report by IMF (2021), Kenya's

real effective exchange rate (REER) has been on an upward trend recently. The REER appreciation has been greater than its nominal value and more significant than that of its regional peers. This has led to a high demand for imports and a weak demand for exports. Exports of goods and services as a GDP ratio remained above 20 per cent from 2001 to 2012 and about 19 per cent from 1998 to 2020. In recent years, Kenya has undergone a weak export performance. Recent data indicates that Kenya has lost its market share since 2015, while other non-resource-intensive SSA countries have gained the market share. Kenya has experienced losses in competitiveness; the reason is the overvalued currency, which is mainly due to foreign borrowing.

Despite the Kenyan government's efforts to reduce foreign debt through parliament legislation where domestic debt was proposed to be the primary source of the total public debt, formulation of relevant policies and institutional framework through extended debt facility arrangements and sustainability assessments. The expanding budgetary demand to improve infrastructure and provide social amenities in Kenya has led to pressure on the limited resources available. As a consequence, the government has resorted to various channels of financing her expenditure, such as taxation and external borrowing, which in turn may affect the overall health of the economy and human development. Furthermore, a recent report by CBK indicates that the government has rescheduled debt and debt interest repayment with the IMF, hence the possibility of debt distress (Republic of Kenya, 2021).

3. Education Challenges in Kenya

According to UNESCO (2023), Kenya's adult literacy rate is 77.53 per cent. The literacy rate is simply the percentage of the population that can read, communicate, write, and count in a particular geographical area in an increasingly digital age.

Figure 2 below shows the trends in the adult literacy rate in Kenya.

Figure 2: Adult Literacy Rate in Kenya
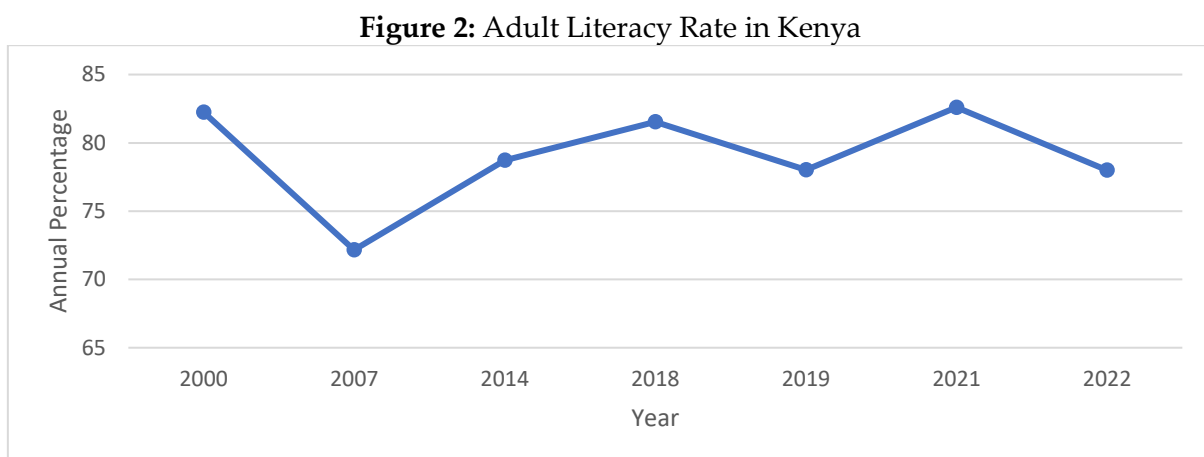
Source: World Bank; UNESCO Institute for Statistics, (2022).

Figure 2 shows the adult literacy rate in Kenya from 2000 to 2022. The long-run average literacy rate was 79.45 per cent in the same period. However, the government

needs to catch up to the target literacy rate, while the expected literacy rate, according to Vision 2030, is 90%. The financing of education, the healthcare system, and infrastructure, as well as improvements in the standards of living, have led to the government seeking foreign debt. Foreign debt is meant to improve human development in Kenya and not to worsen the economic conditions through debt servicing.

Figure 3 below shows the literacy rate of other different groups in Kenya.

Figure 3: Literacy Rate in Kenya for Different Groups
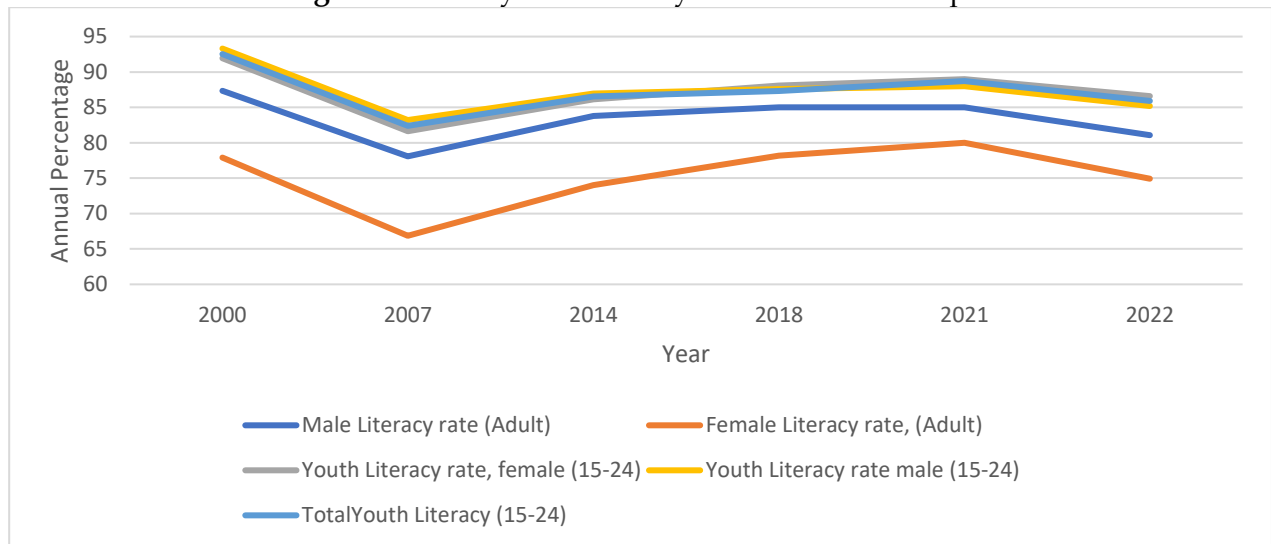
Source: World Bank; UNESCO Institute for Statistics, (2022).

Figure 3 shows the literacy rate of the adult male, adult women, male and female youth between the ages (15-24) and the total youth literacy rate age (15-24). The graph shows that youth have a higher literacy rate than adult females and males. The youth (female) had a high literacy rate compared to their male counterparts from 2018 to 2022. The bulge in the youthful population and the degree of their inclusion in the social and economic development of the country still needs to be solved with high youth unemployment and the rising cost of education. This has exerted pressure on both parents and the government to finance education.

Expenditure on education has been increasing in Kenya, with the government spending KSH 506 billion in the 2020/21 financial year. This was an 8.9 per cent increase from the previous financial year, 2019/20. The continued growth in budgetary allocations in the education sector has also contributed to the high foreign debt to GDP ratio. According to Kenya Vision 2030's target, Kenya aims to achieve an adult literacy rate of about 80 per cent by 2012. However, this was not realized; as of 2014, the adult literacy rate was 78.73%. According to the SDGs report of 2019, the adult literacy rate is expected to reach 90% by 2030.

4. Literature Review

4.1 Theoretical Literature

Theoretical literature on human capital accumulation can be indirectly attributed to economists such as Adam Smith. Smith (1776) postulated that a country's economic progress depended on its citizens' ability to learn and utilize available resources. Hence, the degree of knowledge accounted for differences in wage rates. Adam Smith's growth theory favoured free markets and labour market specialisation. Simply put, Smith advocated for investments in human capital to improve labor productivity, hence promoting economic development (Smith, 1776). However, classical economists like Ricardo, unlike Smith, had reservations about economic growth due to the rapid increase in population growth. Ricardo argued that population growth leads to an increased supply of labour, which can cause labour prices to rise or fall (Ricardo, 1817). Furthermore, Smith did not conceptualize today's unemployed intellectual population. He did not treat utility maximization from a social point of view but rather from a political-economics perspective (Spengler, 1977)

Later, in 1929, during the great depression, Keynes criticized Ricardo and other classical economists who did not foresee that the lack of demand could result in a high unemployment rate. Keynesian theory advocated for full employment in an economy to stimulate demand (Keynes, 1935). In his day, Keynes's approach was effective. However, like the previous economists, he did not foresee that the welfare state would end and that unemployment would be a persistent problem that would need long-term structural transformations even in the present-day world.

For a long time, other theories of economic growth have also been preoccupied with human capital accumulation. The commonly used financial models to interrogate human capital include the Lewis, Harrod-Domar, Rostow, Solow model and Romer growth theories. The theoretical discourse is hinged on the assumption that capital accumulation is necessary for transformational growth, hence the need for investment in it. This will help developing countries bridge the gap with the developed world. Lewis (1984), in his book "Principles of Economic Planning", theorized that in a capitalist economy, economic growth requires capital accumulation and continuous use of profits to train and expand the employment sector.

Harrod-Domar used the Keynes model to explain economic growth. He explained economic growth to be dependent on savings and capital accumulation. When the level of savings increases, investments are expected to increase, increasing labour demand, leading to more capital accumulation and, hence, higher output and income. Here, capital includes fixed capital, human capital, and *health and education*" (Harrod, 1939). Later, neoclassical economists criticized the Harrod Domar model for its inability to be employed in the developing world. This led to the development of economic models such as the Solow-Swan model. The criticisms were on the H-D model assumptions that savings and capital-output ratios were constant. The theory also ignored non-economic factors in a country, such as the sociological setting, which are equally essential to achieving economic development (Solow-Swan, 1956).

Schultz (1961) expanded the theoretical literature to human capital theory in his book "Investment in Human Capital". He argued that education was part of human capital and skills, which led to increased economic output and earnings by the labourers. The theory advocated investing in health facilities, on-the-job training, and skills acquisition to increase labour productivity. It advocated for formal education, extension programmes for adults in agriculture and migration of people searching for better job opportunities. There were many objections to this theory, having been coined at the time of slavery in the USA when minorities were denied access to education. Notably, Maringe (2015) criticized this theory, arguing that there are inconsistencies due to gender disparity, education levels and the job market may not be fair.

Uzawa (1965) introduced the concept of education in the Solow growth model. However, less attention was given to this model due to the lack of rigorous research in economic growth theories from the 1970s to the 1980s. Later, Lucas (1988) resuscitated Uzawa's arguments due to the enormous differences in income per capita worldwide as he explored its effect on human welfare. This led to the formation of the Uzawa-Lucas endogenous growth model. However, the theory was more inclined to Lucas's thinking Uzawa (1965) and Lucas, (1988). Uzawa corresponded with Schultz (1961) when he argued for having a formal education, while Lucas corresponded with Schultz (1961) when he favoured the importance of adult training outside their firms. Lucas's (1988) theoretical discourse on human capital accumulation asserts that an individual's labour time is between acquiring knowledge and production. Additionally, Lucas assumes that utility can only be derived from consumption. Furthermore, Lucas computes capital as the ratio of physical to human capital.

The Solow model attempts to explain differences in living standards worldwide (Solow-Swan, 1956). However, according to Mankiw *et al.* (1992), Solow fails to precisely predict the outcomes of population growth and savings across countries. Subsequently, an augmented Solow model was developed, which includes human capital, hence taking into account the relations between population growth, savings and countries' income differences. Incorporating human capital in this model affects income through physical capital, and population growth and biases due to previously omitted variables in the Solow model are accounted for. A is labor augmenting technology and grows at the rate g. Human capital is accumulated through learning. L is labor.

New endogenous growth theories also emphasize investments in human capital as a key contributor to human development and economic growth, Romer (1986) and Lucas (1988). Romer (1986) argues that investment in education or knowledge is achieved through various means, and it can be primary or advanced knowledge that is important to economic growth. On-the-job training, Research and Development (R&D), and formal and informal education are generally referred to as knowledge. He further asserts that physical capital accumulation in developing countries is not enough. Instead, investment in human capital will lead to the effective use of physical capital.

Building on Lucas (1988), Chakraborty and Gupta's (2006) interrogation of Lucas's theoretical literature argued that human capital accumulation plays two key roles: it is a factor of production and a measure of well-being. In their argument, human capital enters

both the production and utility functions in contradiction to Lucas's (1988) assumption that utility can only be derived from consumption. Bosi, Camacho, and Desmarchelier (2022) further argue that increasing a household's bundle of preferences would be prudent to investigate the effect of health and education on well-being. They add that, theoretically, introducing human capital in the utility function needs careful consideration. Building on this argument (Bosi *et al.*, 2022) argue that marginal utility on consumption may increase when, say, a well-educated person can watch a movie and understand it as compared to an illiterate person who does not derive any utility from such a movie. Hence, human capital affects an individual's preferences, and there would be a high growth rate on the Balanced Growth Path (BGP).

Some economic theories, such as Amartya Sen's (1979) capability approach, provided a welfare argument for policy formulation where people's freedom is a core value. However, (Alkire, 2002) supplemented the capability approach with the concept of human development stemming from a belief that freedoms such as health and education both makeup human capital. To operationalize Amartya Sen's approach, HDI, which comprises education and health, is then incorporated into the consumption utility function. Based on previous studies of Schroyen (2003) built on Besley's (1988) arguments to model consumer utility maximization behaviours given government opinion on merit goods.

4.2 Empirical Literature

Akpan (2019) studied the impact of foreign debt on human development in Nigeria, focusing on poverty reduction to improve human development. The study used ordinary least square (OLS) to analyse time series data on poverty, GDP per capita, expenditure on education and health, inflation, external debt to export ratio and debt servicing. The study concluded that the poverty rate in Nigeria increased due to a poor economic growth record, increasing inflation, and inadequate financing in the health and education sectors. External debt had adverse effects on the fight against poverty. The study then recommends revamping the production sector to improve human development and achieve low poverty rates. However, the study did not capture the actual reality of poverty in Nigeria because it only looked at economic growth. Poverty is multidimensional in nature, and other factors such as income, access to healthcare facilities, and a good education should be considered (White, (2017).

Another study by Viddy, Rafiqoh, and Asniwati (2019) examined the influence of foreign debt on the human development index in Indonesia from 2010 to 2018. The study used the Structural Equation model, while debt and human development were treated as exogenous variables. The human development index was used as an intervening variable concerning economic growth. The results indicated that foreign debt hurt Indonesia's GDP and that human development positively affected the country's GDP. At the same time, both foreign debt and human development had no significant influence on Indonesia's economic growth. However, the measurement approaches to human development index and economic growth differ, although there is a consensus that investing in human development leads to growth (Stewart *et al.*, 2018). External debt, if

used prudently, is expected to yield positive outcomes on human development and economic growth of a country (Manasseh *et al.*, 2022)

A 2023 World Bank report authored by (Wendlassida Miningou, 2023) indicates that high levels of foreign debt can lead to fiscal consolidation, impacting government spending in sectors such as education. Developing countries, he argues, grapple with addressing their debt burdens primarily through strategies like inflation targeting, debt default, or debt restructuring. Nevertheless, fiscal consolidation, mainly through reductions in government expenditure, has been the primary focus of debt management policies. This approach, he postulates, impedes investment in the education sector, which relies on public funding, consequently affecting human capital development in Africa. Additionally, foreign debt poses a significant threat to public spending on education, especially in the aftermath of the Covid-19 pandemic. The report proposes mitigating measures to safeguard investment in public education, thereby enhancing human capital. His study suggests exploring alternative funding sources for public education to reduce the impact of high foreign debt in the sector.

Khundadze and Alvarez (2022) investigated public debt alleviation mechanisms and education financing in seven selected countries. This was part of a research project on the Global Campaign for Education. The project aimed to report the linkage between foreign debt stock and government expenditure on education in Zambia, Nepal, Lebanon, El Salvador, Gambia, Mongolia, and Georgia. Using the relevant econometric model, the study concluded that high foreign debt is not a problem because it enables developing countries with a capital shortage to acquire resources that can be used for economic development. The study hypothesized that debt servicing constrains expenditure on education. The econometric results from Khundadze & Alvarez (2022) showed that a 1% increment in the foreign debt to export ratio leads to a 0.33 per cent decline in public expenditure on education. Their research concluded that different debt-stock ratios had an inverse relationship with spending in education. This makes it difficult for highly indebted countries to increase funding in public education because of the pressures that come from loan repayments. This was especially the case for Zambia and Gambia.

Farayibi and Folarin (2021) conducted a study motivated by the underperformance of African countries in global human capital competitiveness. Their research delved into the effectiveness of public expenditure on education across 31 Sub-Saharan African nations from 2000 to 2019. Employing the Generalized Method of Moments (GMM), the study identified key areas of government spending on public education in the region. The findings revealed a predominant focus on primary and secondary education in Africa, attributed to the political advantages associated with these levels compared to tertiary education. Moreover, they argued that institutional rigidities within the governance structure led to unequal resource allocation to higher education, rendering it less adaptable to the global labour market and knowledge demands. The study advocated for two policy interventions: first, targeting government public expenditure across all levels of education to enhance human capital development,

and second, improving the capacity of educational institutions through equitable resource distribution.

On the contrary, Hall & Jones (1999), Klenow & Rodriguez-Clare (1997), and others argue that there are shortcomings to cross country regressions, such as those done by Zaghdoudi (2018) and Mezni & Djebali (2022), in that there could be differences in cross country observations due to differences in human capital. Hence, a country-by-country approach is desirable. This agrees with Azam and Guillaumont's (1988) assessment of the challenges associated with cross-country studies. The study explains that cross-country studies in developing countries give contradicting results, and a researcher may lack available complementary statistical data, especially regarding the government's budgetary allocations and sample selections, making the study recommendations weak to inform economic policy. Similarly, Levine and Renelt (1991) caution about the reliability of findings associated with cross-country regressions. Furthermore, Levine *et al.*, (2016) argue that linking policies may be misleading in the long run.

Other studies have used human capital as a proxy for health, education and labor productivity. Bahrain, Syah Aji, Yussof & Saukan (2019) investigated labour productivity in Indonesia from 1981 to 2014 using World Bank data. The research utilized the ARDL method and showed that primary and secondary school education positively affected short- and long-term labour productivity. In contrast, tertiary education only had a positive effect in the short term and a negative correlation to labour productivity in the long term. Health had positive but not significant outcomes on the productivity of labor. Igudia, (2021) also examined the effects of external debt on human capital development in Nigeria from 1960 to 2019. The OLS regression results indicated that foreign debt servicing negatively correlated to human capital development. Meanwhile, GDP, inflation, and other variables have increased education and health spending. The study further reveals that a non-political approach should be employed to guide the accusation of foreign debt so that the funds can be used productively. Hence, enough revenue can be generated to pay off the debt.

5. Research Methodology

In line with Chakraborty and Gupta's (2006) discussion of human capital (education) and Schroyen's (2003) representation of a merit good (education), this study takes a merit good (x) to represent the various components of HDI. When the government finances the provision of merit goods, there is a burden to be borne by the citizens through taxes now or borrowed funds that will be paid by an additional interest rate. Consequently, when there are numerous public goods to be provided for in an economy, the variable T in Equation (i) will represent the various methods of financing merit goods (education) in a country.

From the above discussions, the effect of foreign debt on human development (education) was determined using the equation derived from Schroyen's (2003) study of human development below.

$$HDI = \mathrm{f}(X_i, T_i) \tag{i}$$

HDI is human development representing the dependent (response) variable. Ti represents HDI financing options, and X_{it} represents other independent (explanatory) variables determining HDI. The empirical literature reviewed on human development gives clear merit on several socio-economic indicators to be used to analyse human development. For this reason, lending interest rates, manufacturing, exports, FDI, gross domestic product, and population growth rate were some of the explanatory variables in used in this study. Given that human development is an education component, the equation can be simplified further to introduce education, which measures literacy rate as defined in the UNDP report (UNDP, 2010) and the other social-economic variables.

$$e = \alpha + \beta_1 ed + \beta_2 fdi + \beta_3 m + \beta_4 pg + \beta_5 \exp + \beta_6 li + \beta_7 ex + \beta_8 dd + \mu \tag{ii}$$

Where the dependent variable e education measured by the literacy rate, which is the primary school completion rate, α is a constant, ed is the external debt, fdi is the foreign direct investment, m is manufacturing as a percentage of GDP, exp is exports as a percentage of GDP, pg is the population growth rate, li is the domestic lending interest rates, ex exchange rate, dd is the domestic debt and μ is the error term.

6. Findings

To establish the effect of foreign debt on the literacy rate in Kenya, the literacy rate was treated as a dependent variable. In contrast, external debt, domestic debt, lending interest rates, exports, foreign direct investments, manufacturing value addition, population growth rate and exchange rate were used as independent variables. The ARDL model was used for estimation, employing OLS in the long-run and short-run analyses.

The error correction term (ECT) of literacy rate was more significant than one, but it had a negative sign and was statistically significant. A magnitude of -1.110703 implies that there is an over-reaction for the system to adjust in the long run with oscillatory convergence to the stable state to correct errors of the previous period after an economic shock. D1 is the current period, while LD is the previous period. In the long run, external debt, exports, population growth rate, manufacturing, and domestic lending interest rates were statistically significant with a p-value of less than 0.05; hence, they could explain changes in literacy rate.

In the long run, a percentage point change in external debt is associated with a 0.45 per cent decline in literacy rate. This implies that external debt negatively influences the literacy rates in the country in the long run. Igudia (2021) OLS regression results indicated similar results that foreign debt servicing negatively correlated to human capital development in Nigeria. A percentage change in exports as a percentage of GDP is associated with a 0.56 per cent increase in the literacy rate. A percentage change in population growth is associated with a 1 per cent decline in the literacy rate. A unit change in lending rates was associated with a 0.54 unit decline in literacy rate.

Table 1: ARDL regression results

Dependent variable: Literacy rate				
Estimation Method: Ordinary Least Squares				
Long run relationship				
	Coef.	**Std. Err**	**T**	**P > t**
ADJ literacy rate	-1.110703	.2328121	-4.77	0.005
External debt	-0.4522433	0.0762369	-5.93	0.002
Domestic debt	-0.2802369	0.1401031	-2.00	0.102
Foreign direct investment	-0.029628	0.0204583	-1.45	0.207
Exports	0.5596815	0.0723087	7.74	0.001
Population growth rate	-104758	0.1935888	- 6.22	0.002
Manufacturing	-0.4974599	0.1234499	-4.03	0.010
Lending interest rate	-0.548079	0.0492076	-11.14	0.000
Exchange rate	-0.0528581	0.0578756	-0.91	0.403
Short Run relationship				
	Coef.	**Std. Err**	**T**	**P > t**
Literacy rate	0.9538171	0.1922189	4.96	0.004
External debt	0.46685	0.0920732	5.07	0.004
Domestic debt D1	0.0799785	0.1098754	0.73	0.499
LD (Lagged Difference)	0.2291313	0.0814802	2.81	0.037
Foreign direct investment D1	0.0427967	0.0146072	2.93	0.033
LD (lagged difference)	0.0310248	0.0087211	3.56	0.016
Exports D1(1ˢᵗ Difference)	-0.7871562	0.0880262	-8.94	0.000
Population growth rate D1	0.5914506	0.364201	1.62	0.165
LD (Lagged Difference)	0.4944486	0.3742478	1.32	0.244
Manufacturing D1	0.1524088	0.1039537	1.47	0.203
LD (lagged difference)	0.1054368	0.0723712	1.46	0.205
Lending interest rate D1	0.1930943	0.1076968	1.79	0.133
LD	0.0875805	0.0643239	1.36	0.231
Exchange rate D1	0.2090078	0.0788004	2.65	0.045
LD	0.3519936	0.0869232	4.05	0.010
Cons	10.14901	2.335668	4.35	0.007
Sample: 1992 - 2021 Number of obs = 30 R-squared = 0.9872 Adj R-squared = 0.9256 Log likelihood = 108.89176 Root MSE = 0.0157				

Source: Author.

In the short run, external debt, domestic debt during the previous period, foreign direct investment in the previous and current periods, and exports during the last and current periods were statistically significant. A percentage change in external debt was associated with a 0.46 increase in the literacy rate. External debt affects the literacy rate positively and negatively in the long run. This could be an indication of unproductive debt. In the short run, a percentage change in domestic debt at first lag was associated with a 0.23 per cent increase in literacy rate. A percentage change in foreign direct investment in the current and previous periods was associated with a 0.043 and 0.03 unit increase in literacy

rate, respectively, holding other factors constant. This may be due to the expected skills transfer with increased foreign direct investments in flowing into the country. A percentage change in exports as a percentage of GDP was associated with a 0.787 per cent decline in the literacy rate. A unit change in the exchange rate at the level and first lag was associated with a 0.209 and 0.35 unit increase in literacy rate, respectively.

7. Discussions

External debt is expected to contribute to sustainable development and influence the general well-being of society. Foreign debt through investments is expected to create employment, where the populace can earn income, facilitating improvements in sectors such as education. The study findings have indicated varied outcomes of foreign debt on the literacy rate. The study equation literacy rate had both the long-run and short-run relationships that were used to answer the research objective, which was to investigate the effect of foreign debt on the literacy rate.

In the long run, a percentage point change in external debt was associated with a decline in literacy rate. This was in line with economic expectations where resources meant for investments in the education sector may have been used for debt servicing. These constraints financial resources intended for development programs in the education sector. Other independent variables showed the following outcomes on literacy rate in the long run. A percentage point change in exports was associated with an increased literacy rate. A percentage point change in population growth is a decline in literacy rate. A percentage-point change in lending rates was associated with a decrease in literacy rates.

In the short run, a percentage point change in external debt was associated with an increased literacy rate. The positive association between external debt and literacy rate in the short run does not imply long-term improvement in literacy. However, it may be because external debt stimulates the sector in the short term. When external debt is used to finance programs such as campaigns during a pandemic, it may lead to public awareness and increases in the literacy rate, which has a positive impact and is context-specific in the short term without a long-term associated outcome. A percentage change in domestic debt at first lag was associated with an increased literacy rate. A percentage change in foreign direct investment was associated with an increased literacy rate. This may be due to skills transfer when foreign companies relocate some of their operations to Kenya. A percentage change in exports was associated with a decline in the literacy rate and a unit change in the exchange rate was associated with an increase in the literacy rate.

8. Conclusions

External debt is essential in acquiring capital that is not locally available and can help boost development in the country. Furthermore, foreign indebtedness is not an entire problem, but investment in sectors with higher returns, especially the tradable sectors, is

key to shifting the country's overreliance on foreign debt. In the short run, external debt had positive and negative associations with education, which measured literacy rate. Debt should be prudently managed to alleviate the associated risks of high foreign indebtedness to future generations. In the long run, foreign debt was associated with a decline in literacy. This indicates the possible costs related to debt servicing, which may make it difficult for the government to break the cycle of borrowing funds, sometimes even to repay the already existing debt. In the short run, foreign debt positively correlated with literacy rate.

The short-run positive influence resulting from external and domestic debt may be due to its stimulating effect on the economy. An increase in government expenditure is an expansionary fiscal policy which is expected to boost aggregate demand, as explained by Keynesian economists. In the short run, the domestic debt positively impacted the literacy rate. The domestic lending rate was associated with a decline in the literacy rate in the long run. This indicates the possibility of a crowding-out effect where funds meant for private investments and expenditure in the education sector are reduced because commercial banks may prefer lending to the national government at a higher interest rate, locking out private investors. Domestic debt is less susceptible to external macroeconomic shocks; therefore, effective management of domestic lending interest rates and a balance between foreign and domestic debt will help the national government cover the budget deficits and still promote economic advancement, leading to overall stability in the economy.

Conflict of Interest Statement
The authors declare no conflicts of interest.

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