The Impact of High Living Costs, Urban Agglomeration, and Inequality on the Core Economic Drivers of Urban Out-Migration in Sub-Saharan African Cities

*Nzabirinda Etienne**

Abstract

This paper examines the impact of high living costs, urban agglomeration, and inequality on urban out-migration in Sub-Saharan African (SSA) cities, focusing on the spatial geo-economic dynamics that shape migration flows. Using World Bank data and the fixed effects technique, the study identifies income inequality, rapid urbanization, and rising living costs as the main determinants of migration. The study finds that SSA cities are urbanizing rapidly, with an average net migration rate of 1.09, driven by rising living costs, inequality, and uneven economic opportunities. Major cities like Lagos, Kinshasa, and Johannesburg attract migrants but face severe housing shortages and high expenses. Income inequality remains high (Gini = 0.81), and urban growth at 5.29% strains infrastructure. The fixed effects model shows that inequality (β = 0.9784), slum prevalence (β = 0.0029), and youth unemployment (β = 0.1854) significantly drive out-migration. In contrast, agglomeration (β = -0.2041) and health spending (β = -0.0754) reduce it. The model's robustness (Hansen's J = 0.183) confirms that high living costs, inequality, and weak welfare systems fuel migration from Africa's major cities. The study concludes that urban out-migration is shaped by the paradox of agglomeration economies, where opportunities coexist with exclusionary pressures; and recommends policy interventions such as affordable housing, economic decentralization, slum upgrading, and improved service provision to address migration challenges, and promote sustainable urban development.

Keywords: *high living costs, agglomeration, inequality, out-migration Sub-Saharan Africa*

JEL Classification: R23, O18, D3

1. Introduction

Urbanization has long been recognized as a critical driver of economic growth, innovation, and access to essential services globally. Cities concentrate labour, capital, and knowledge; thereby fostering productivity, entrepreneurship, and social dynamism. However, alongside these opportunities, rapid urban growth often brings significant challenges; including rising living costs, inequality, and social exclusion. These dynamics are particularly pronounced in sub-Saharan Africa (SSA), where urbanization occurs under more constrained socio-economic and infrastructural conditions than in many other regions. The region's urban

*PhD Candidate at the University of Rwanda, College of Business and Economics, in collaboration with the University of Gothenburg, Gothenburg School of Business, Economics and Law:E-mail: etienne.nzabirinda @gmail.com

population has grown rapidly, from 133m in 1990 to over 360m in 2022; reflecting a demographic transition comparable to trends in Latin America and Asia, but within contexts of weaker institutional capacity, limited infrastructure, and widespread poverty (United Nations, 2022).

African urban centres—such as Lagos, Nairobi, Kinshasa, and Johannesburg—are increasingly becoming hubs of economic opportunity, attracting both domestic and international investments. They concentrate industries, services, and labour markets; thereon providing potential pathways out of poverty for some households. Yet, the benefits of urbanization are unevenly distributed. A substantial proportion of the population resides in informal settlements or slums, where housing is inadequate, infrastructure is poor, and access to essential services is limited. UN-Habitat (2020) reports that over 58% of urban residents in SSA live in such conditions, reflecting a persistent urban challenge: the simultaneous coexistence of economic growth and extreme inequality. Cities like Lagos and Kinshasa exemplify these dynamics: struggling to provide affordable housing for burgeoning populations, and thereby forcing many households into informal housing arrangements or peri-urban areas (Cira et al., 2016).

High urban living costs further exacerbate social and economic inequalities. Studies indicate that urban households in SSA pay between 20% and 30% more for basic goods and services—including food, water, electricity, and transportation—compared to rural households. This disparity arises from inefficient supply chains, inadequate infrastructure, and limited competition in urban markets (Lall et al., 2021; Frayne et al., 2014). Higher costs of living directly affects household welfare by constraining disposable income, food security, and financial stability; and forcing low- and middle-income families to adopt coping strategies such as moving to peri-urban or rural areas.

Urban agglomeration, i.e., the concentration of population and economic activity in specific urban centres, can intensify these inequalities. Affluent households tend to secure better access to healthcare, education, transportation, and other urban amenities; while poorer communities face spatial and socio-economic exclusion. Furthermore, economic growth and foreign investment frequently favour already prosperous areas, reinforcing socio-economic divides, and marginalizing low-income populations (Satterthwaite & Tacoli, 2020).

The cost of living in SSA's urban centres has risen sharply, driven by factors such as housing shortages, inflation, and inadequate infrastructure. Urban households often pay 20% to 30% more for essential goods and services compared to their rural counterparts (Lall et al., 2021; Frayne et al., 2014). This disparity exacerbates economic inequality, as wealthier households can better absorb these costs, while low- and middle-income families face financial strain.

In SSA, the combined pressures of high living costs, urban agglomeration, and economic inequality, shape distinct patterns of migration. While rural-to-urban migration has historically been viewed as a pathway to economic opportunity, urban out-migration is increasingly observed as a strategy for coping with the high

cost of city living. In seeking for more affordable housing, lower food prices, and reduced financial stress, households often relocate to smaller towns, secondary cities, or rural areas. This phenomenon underscores the need to conceptualize urban out-migration not solely as a response to rural underdevelopment, but also as a pragmatic response to urban socio-economic pressures.

This paper aims to examine the factors driving urban out-migration in SSA, with a focus on the interactions between high living costs, urban agglomeration, and inequality. It also situates these dynamics within a broader geo-economic and political context; by considering how governance structures, infrastructure development, and human capital investments shape migration decisions. By exploring these interlinked processes, the study seeks to inform policy interventions aimed at promoting inclusive urban development, and mitigating the socio-economic costs of rapid urbanization.

The structure of the rest of the paper is as follows. Section 2 presents a review of the relevant literature; section 3 describes the methodology; while section 4 provides the empirical analysis and results. Section 5 concludes with policy recommendations.

2. Literature Review
2.1 Introduction
Sub-Saharan Africa (SSA) is experiencing one of the fastest rates of urbanization globally, which is driven by population growth, rural-to-urban migration, and the pursuit of economic opportunities. However, this rapid urban expansion has frequently outpaced the development of infrastructure, housing, and public services; giving rise to complex socio-economic challenges.

This section reviews the theoretical and empirical literature pertaining to high urban living costs, urban agglomeration, and economic inequality; with particular focus on how these factors influence urban out-migration. The review situates these dynamics within SSA's distinctive socio-economic context; and highlights the mechanisms through which urbanization pressures interact with migration decisions.

2.2 Theoretical Review
2.2.1 High Urban Living Costs
Urban centres in SSA—including Lagos, Nairobi, and Kinshasa—have experienced substantial increases in the cost of living. These trends are primarily driven by housing shortages, inflationary pressures, and the concentration of economic opportunities within cities (UN-Habitat, 2020). In West African cities—such as Abidjan and Douala—housing prices have increased by up to 80% over the past five years; thereby exacerbating affordability challenges (UN-Habitat, 2023). Moreover, the prevalence of informal settlements, where over 60% of urban residents reside, exposes households to inadequate infrastructure, poor sanitation, and limited access to basic services (World Bank, 2022). These conditions contribute to heightened economic vulnerability among low-income urban populations.

2.2.2 Urbanization and Economic Growth

SSA countries have witnessed rapid urban population growth, with urban dwellers comprising 43% of the population by 2020; and projected to exceed 60% by 2050 (UN, 2022). Migration to urban centres is predominantly motivated by the pursuit of employment, education, and healthcare opportunities. Although urbanization theoretically fosters economic growth through agglomeration economies, the benefits in SSA have been unevenly distributed. Many urban residents continue to face high living costs and limited employment opportunities, which constrain the potential economic advantages of urbanization (World Bank, 2022).

2.2.3 Economic Disparities and Migration Patterns

Economic disparities between urban and rural regions significantly shape migration patterns in SSA. While urban centres provide higher wages and greater employment opportunities, living costs—including housing, transportation, and access to services—often exceed the financial capacity of many residents. For example, in Nairobi, housing costs alone may account for up to 70% of household income, despite a per capita GDP of USD2,400 (World Bank, 2022). Conversely, rural areas, though economically underdeveloped, offer lower living costs and more affordable housing, rendering them an attractive alternative for households unable to sustain urban livelihoods. These dynamics frequently give rise to *circular migration*, wherein individuals alternate between urban and rural areas to balance income opportunities against living costs (Tacoli, 2017; UN-Habitat, 2023).

2.2.4 Urban Agglomeration and Informal Economies

Urban agglomeration refers to the concentration of populations and economic activities within urban centres. In SSA, rapid urban expansion has often exceeded the capacity of city planning and infrastructure development. This has resulted in high-density informal settlements, insufficient public services, and a pervasive informal labour market. The informal economy constitutes over 60% of the urban workforce, with employment concentrated in low-paid and precarious jobs (ILO, 2021). While informal settlements on urban peripheries reduce living costs, they remain economically marginalized, limiting access to markets, services, and productive opportunities (Satterthwaite, 2016).

2.2.5 Agglomeration Economics

The theory of agglomeration economics posits that *concentrated economic activity within urban centres generates productivity gains* through mechanisms such as division of labour, economies of scale, and knowledge spillovers (Duranton & Puga, 2004; Glaeser et al. 1992). Agglomeration economies are typically classified as:

(a) *Localization economies* – Benefits accrued by firms within the same industry, such as shared labour pools, suppliers, and customer bases.

(b) *Urbanization economies* – Advantages derived from proximity to diverse industries, which facilitate innovation, information exchange, and productivity enhancement (Krugman, 1991; Marshall, 1890).

Despite these theoretical benefits, the realization of agglomeration economies in SSA is often constrained by inadequate infrastructure, weak urban planning, and persistent inequality: all of which limit the capacity of urban centres to function as engines of economic growth; thereby influencing migration dynamics.

2.3 Empirical Review
2.3.1 Urbanization and Economic Outcomes in SSA
Empirical studies indicate that urbanization in SSA does not consistently produce the poverty reduction and economic growth observed in other developing regions, such as Latin America and Asia (Gollin et al., 2013; World Bank, 2015). Rapid urban population growth has, in some cases, intensified inequalities and constrained economic opportunities for lower-income residents (Behrman et al., 2007; World Bank, 2016).

2.3.2 Living Conditions, Informality, and Migration
High living costs and limited access to essential services compel urban residents to relocate to smaller cities, peri-urban areas, or rural regions where affordability is higher. Informal settlements provide some social support networks but remain characterized by inadequate infrastructure and service provision, thereby reinforcing socio-economic inequalities (Tacoli, 2009; Selod & Shilpi, 2021). Hence, circular migration emerges as a coping strategy that enables households to balance urban economic opportunities against living costs (Serdeczny et al., 2017). Policy interventions focusing on housing affordability, income equality, and access to services are critical in reducing pressures for urban out-migration, and promoting sustainable urban development (Mueller et al., 2020; Fields, 1982).

3. Materials and Methods
3.1 Source of Data
The data for this study are extracted and combined from several databases, which included: (i) the SWIID, which provides the Gini index to assess the level of income inequality across SSA; (ii) World Bank data on urbanization, industrialization, and GDP, which helps analyse economic growth and urban expansion; (iii) the UNDP, which offers urbanization rates, highlighting the rapid growth of cities in the region; (iv) World Governance Indicators, which provides governance metrics that are crucial to the understanding of how effective policies affect living conditions; and (v) the World Penn Tables Human Capital Index, that provides data for education and labour market participation—both basic causes of migration and inequality.

According to the sources in Tables 1, the data for this study was gathered from sources of international reliability. Gini index related to income inequality has

been sourced from SWIID; while information on urbanization, GDP growth, industrialization, and employment in urban industries was sourced from the World Bank. Further, the UNDP provided the data related to urbanization, while the Governance Effectiveness Index was availed from the WGI (World Governance Indicators). Finally, human capital from educational attainment is captured by the World Penn Tables. These data ensure consistency and credibility for the analysis of economic factors determining urban out-migration in SSA.

Table 1: Variable Description, Measurements, and Data Sources

Variable Name	Measure	Data Source
Income Inequality (-1)	Gini index (lagged by 1 period)	SWIID
Urban Share	Urban share (%) of population (total urban population ÷ total country's population)	World Bank
Urban Share. Sq	Square of the urban share (%) of population	World Bank
Urban Share > 1M	Share (%) of urban population in agglomerations of more than 1 million people	World Bank
Urbanization Rate	Ratio of urban population to rural population	World Bank/ UNDP
Urbanization Rate. Sq	Square of the urbanization rate	World Bank/ UNDP
GDP per capita growth	GDP per capita growth (annual % change)	World Bank
GDP per capita growth	Square of the GDP per capita growth (annual % change)	World Bank
Industrialization	Share (%) of population employed in urban industries	World Bank
Governance policy preference	Governance Effectiveness Index (proxy measure)	WGI/World Bank
Human capital index	Human Capital Index per person (based on years of schooling and returns to education)	World Penn Tables

Source: Author (2024)

3.2 Study Setting
3.2.1 *GDP Per Capita and Urban Agglomeration in SSA Cities.*
Figure 1 shows that the very low GDP per capita averaging at $1,600 in SSA in 2022 contributes to rising income inequalities, especially in urban areas. Even with low incomes, rapid growth has marked cities like Lagos and Nairobi, with housing costs having increased by 50-80% in the past ten years. In Nairobi, for instance, despite the GDP per capita being $2,400, about 60% of the population lives in informal settlements that are characterized by inadequate infrastructure. High living costs and low incomes make urban life unaffordable for many, who then move to city fringes, or rural areas where living is cheap; but where economic opportunities are limited. Although cities like Lagos have higher GDPs, the growth is concentrated in certain sectors, leaving the majority of the population behind and contributing to continued rural population growth, although at a slower rate of 1.2% annually.
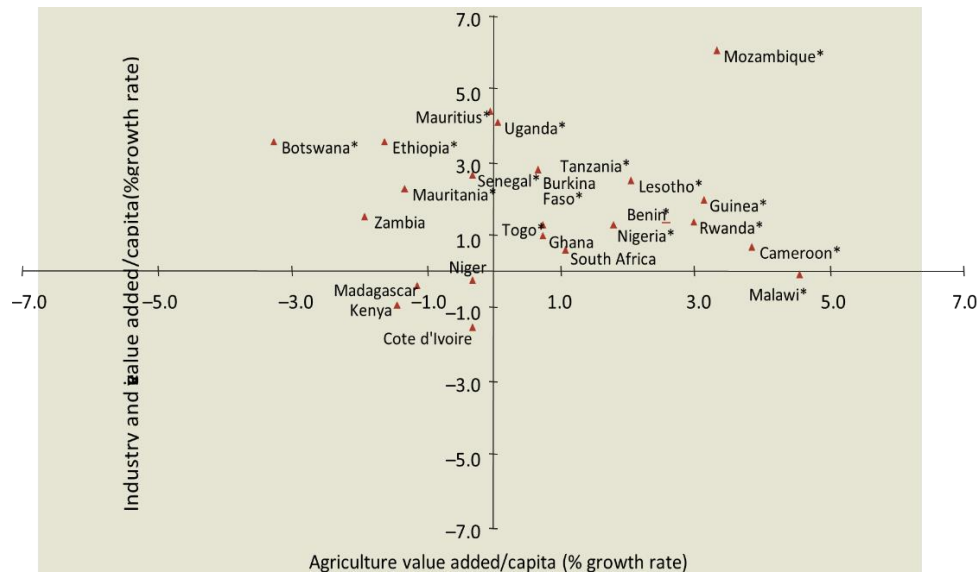
Figure 1: GDP per capita in Sub Saharan Africa
Source: Author,2025

3.2.2 Employment in Agriculture vs. Urban Population, 1991–2024.
Figure 2 shows that between 1991 and 2024, SSA countries experienced a shift
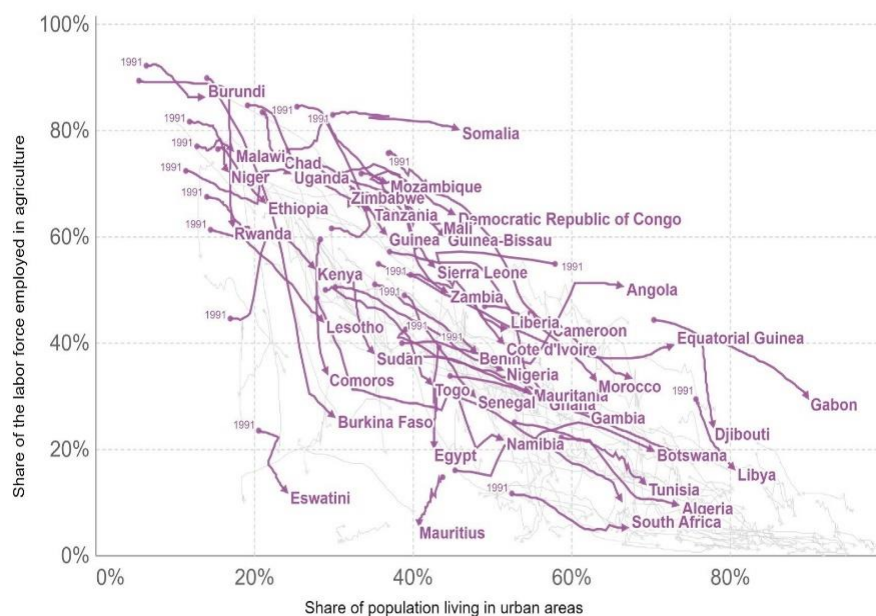from agriculture to urbanization.

Figure 2: Employment in Agriculture vs. Urban Population, 1991–2024.
Source: Ritchie and Roser (2018), CC BY.

As per Figure 1, agricultural employment decreased from 65% to 45%; while urban populations grew from 25–30% to over 50%. While this migration to urban areas has created economic opportunities, it has also exacerbated inequality as many people work in informal sectors. The decline in agricultural jobs raises concerns about food security, as urban areas become more reliant on food imports; while rural regions face labour shortages. This trend is evident in cities such as Kinshasa (DRC), Lagos (Nigeria), Johannesburg (South Africa), Nairobi (Kenya), Luanda (Angola), Dar es Salaam (Tanzania), Accra (Ghana), Abidjan (Ivory Coast), Douala (Cameroon), and Kampala (Uganda).

3.2.4 Study of Geographic Location of Largest Agglomeration City in SSA
From Figure 3, cities such as Kinshasa, Lagos, Johannesburg, Nairobi, Luanda, Dar es Salaam, Accra, Abidjan, Douala, and Kampala illustrate the complex challenges of rapid urbanization in SSA.
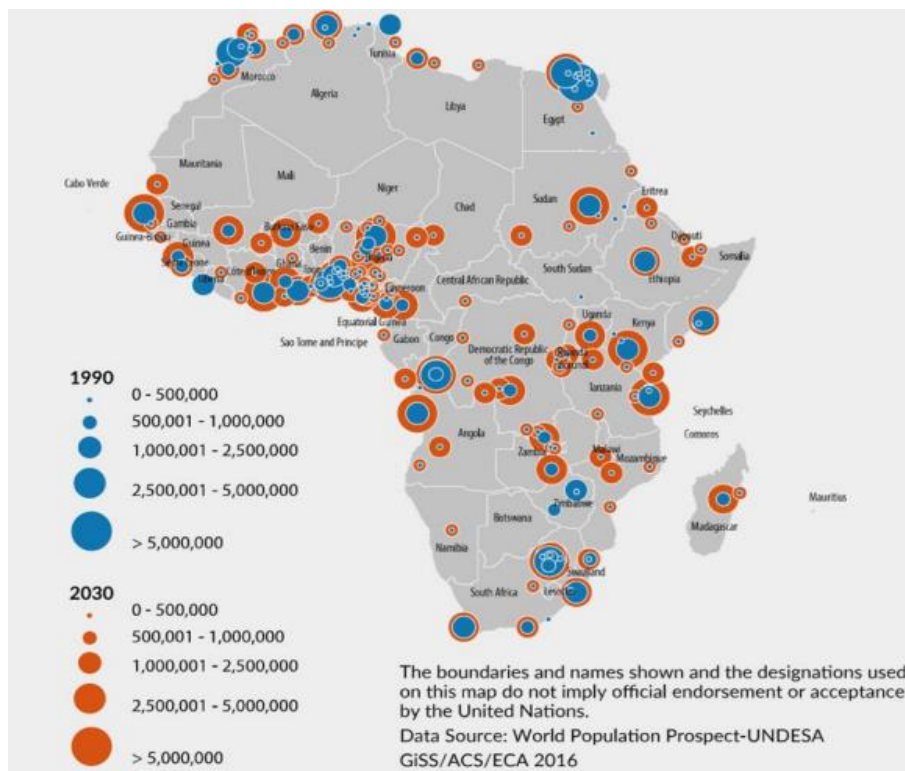

Figure 3: Map showing the largest cities by population in SSA
Source: UNECA (2017)

As these cities grow, living costs rise sharply due to increased demand for housing, goods, and services. For instance, in Lagos and Kinshasa, housing prices

are soaring, forcing many to live in informal settlements that have limited infrastructure. Urban agglomeration creates economic opportunities but also strains resources, with cities like Nairobi and Accra becoming hubs of commerce, while grappling with overcrowded streets and underdeveloped public services. Inequality remains a key issue, with wealth being concentrated in specific areas; while large portions of the population work in informal sectors with low wages and poor conditions, as seen in cities like Abidjan and Douala.

3.3 Econometric Model

A dynamic econometric model estimated using fixed effects model will be employed to analyse high living costs, urban agglomeration, inequality, and urban out-migration in SSA cities. Following the stylized UE model of Bertinelli and Black (2004), we take a step further with an empirically testable prediction: the quality of urban infrastructure significantly influences economic performance by enhancing the benefits of urban agglomeration.

The system fixed effects model is specified as follows:

Migration it = a + $\beta1$Income inequality it + $\beta2$Urbanization Rate it + $\beta3$Night-Time Lights it + $\beta4$GDP per capita it + $\beta5$Slum%it + $\beta6$Youth Unemployment it + $\beta7$Food insecurity it + $\beta8$Agglomeration it + $\beta9$Health expenditure it + μe + τt + ϵit　　　　　(1)

Urban migration in SSA is largely driven by a combination of high living costs, urban agglomeration, and economic inequality. As cities grow, rising costs and overcrowding push many people—particularly from poorer backgrounds—to migrate to less populated areas or rural regions. Income inequality within cities further exacerbates these migration patterns, with poorer individuals often unable to afford basic services, or housing in urban centres. Youth unemployment and food insecurity also play significant roles in driving people to seek better opportunities elsewhere. In some cases, economic growth in cities may create new opportunities; but may also increase living costs, thereby making migration a complex balancing act between seeking jobs and dealing with urban pressures.

4. Results

4.1 Descriptive Statistics of Data

This section presents descriptive statistics and stylized facts based on an analysis of urban growth, inequality, and migration trends in SSA. The data highlights factors showing whether high living costs and urban agglomeration push people to out-migrate. By examining these variables, the analysis identifies the patterns that suggest a connection between rising urban living costs, the concentration of economic activities, and the increasing disparities within urban populations that may compel people to leave for more affordable and less congested areas.

Table 2 provides descriptive statistics of SSA cities, offering critical insights into the nature of urban out-migration. This phenomenon is associated with high living costs, agglomeration, and inequality.

Table 2: Urban, Economic, Social, and Environmental Trends in Sub-Saharan Cities

Variable	N	Mean	SD	Min	Max
Log Net migration	400	1.092	0.23	0.8	1.9
Log Income inequality	250	0.81	0.9	0.43	0.73
Urban rate (% of total population)	320	4.403	1.545	1.021	9.237
Log Urban rate (past five years) (%)	320	5.287	0.589	3.08	9.012
Log Night-time lights	100	6.40	1.320	3.75	10.90
Log GDP per capita (log)	220	7.45	0.840	5.60	9.45
Log GNI (annual growth, %)	210	1.25	0.980	1.230	2.210
Log Employment in industry (%)	200	2.595	0.483	2.90	3.485
Log Slums (% of urban population)	150	0.310	1.187	0.01	1.70
Log Agglomeration	160	4.650	0.410	3.50	4.700
Log Employment in agriculture (%)	190	7.510	0.185	6.00	8.8
Log Health expenditure (% of GDP)	200	1.89	1.210	0.40	4.75
Log Mobile cellular subscriptions	210	2.530	0.324	1.175	2.6770
Log Current education expenditure (%)	130	5.020	1.230	7.790	9.890
Log Agricultural land (%)	210	4.835	1.875	4.20	8.500
Log Forest area (% of land area)	200	2.485	1.090	0.10	9.050
Log Youth unemployment (%)	220	1.690	1.430	2.20	5.001
Log Food insecurity	160	4.990	1.650	2.050	8.530

Table 2 shows that the net migration rate averages 1.092, indicating a significant inflow into urban centres, particularly in cities like Lagos, Kinshasa, and Johannesburg, which serve as economic hubs despite facing challenges such as housing shortages. In contrast, migration rates are low for cities like Mogadishu and Juba due to political turmoil.

Further, the table shows that income inequality is high, with a Gini coefficient of 0.81, leading to a concentration of wealth in cities such as Johannesburg and Lagos. A large proportion of residents in these cities experience poverty, and lack access to services; thereby motivating migration towards cities with more economic opportunities. The average urbanization rate is 4.403, with high growth rates in cities like Abuja, Accra, and Kampala putting pressure on housing and infrastructure. In contrast, cities like Windhoek and Dodoma grow at a slower rate, allowing for a more manageable expansion.

Over the last five years, the average urban growth rate has been 5.287, resulting into intense sprawls in cities like Lagos, Nairobi, and Johannesburg; leading to strained resources and services. Night-time light intensity averages 6.40, indicating high demand and economic activities in cities like Lagos and Kinshasa, leading to increased living costs. Cities such as Abuja, Johannesburg, and Cape Town have a higher GDP per capita at 7.45, though this wealth is still unequally distributed.

The GNI growth is at 1.25, showing steady economic expansion in cities like Accra, with slower growth in Kinshasa and Mogadishu limiting job creation and prompting migration. Industrial employment remains low, with more

opportunities in Cape Town and Mogadishu needing to be created. The average slum population is 0.310, highlighting urban housing crises that intensify migration due to inadequate living standards.

Agglomeration, averaging 4.650, reflects economic processes that ensure growth while increasing living costs inequality. Youth unemployment averages 1.690, posing a significant challenge in cities like Kinshasa, Lagos, and Mogadishu; and leading to increased migration in search of better job prospects. Food insecurity, averaging 4.990, also contributes to migration; with cities like Kinshasa and Lagos struggling to provide affordable and nutritious food to their populations.

4.2 Fixed Effects Model Estimation Results

Table 3 highlights the interplay between urban dynamics, economic geography, and inequality, specifically focusing on the drivers of urban out-migration in SSA cities.

Table 3: Fixed Effects Model Estimation Results

Variables	Coefficient	Z-value	P-value > Z
Constant	-0.0012	0.432	0.005
Log Migration	0.1823*	2.253	0.024
Log Income Inequality (Lag)	0.9784***	75.262	0.000
Log Urban Rate (% of Total Pop)	-1.5023	-1.056	0.001
Log Urban Rate (Past 5 Years, %)	-0.0034	-0.162	0.001
Log Night-Time Lights (Log)	0.7356*	1.526	0.007
Log GDP per Capita (Log)	-0.0163	-0.429	0.008
Log GNI (Annual Growth, %)	0.2418***	3.358	0.001
Log Employment in Industry (%)	0.0023	0.841	0.000
Log Slums (% of Urban Population)	0.0029***	4.821	0.000
Log Agglomeration	-0.2041	-1.293	0.006
Log Employment in Agriculture (%)	0.1124***	4.887	0.000
Log Health Expenditure (% of GDP)	-0.0754	-1.794	0.043
Log Mobile Cellular Subscriptions	0.0034	0.340	0.004
Log Agricultural Land (%)	-0.0342	-1.587	0.113
Log Forest Area (% of Land Area)	0.0587	1.634	0.002
Log Youth Unemployment (%)	0.1854**	2.438	0.015
Log Food Insecurity	-0.0131**	-2.620	0.009

Notes: Significance Levels: *p < 0.01, p < 0.05, *p < 0.1*.

The results from the fixed effects model estimation imply that the high cost of living, agglomeration, and inequality are key drivers of out-migration in urban dynamics for cities like Abidjan, Lagos, Nairobi, and Johannesburg. In Lagos, rapid urbanization results in informal settlements, housing shortages, and high rents, leading low-income residents to move to peri-urban areas or secondary cities like Ibadan. Similarly, in Nairobi, slum conditions and high food prices drive many inhabitants to migrate, as indicated by the coefficient for Log Slums of 0.0029.

Also, urban agglomeration presents challenges in cities like Johannesburg and Dar es Salaam. While Johannesburg's economic opportunities attract migrants, congestion, housing shortages, and inequality push others to nearby areas like

Pretoria. Dar es Salaam faces similar issues, with poor urban planning leading to outward migration to regions like Dodoma. The negative coefficient for agglomeration (Log Agglomeration, coefficient: -0.2041) reflects this trend. The positive relationship of night-time lights (Log Night-Time Lights, coefficient: 0.7356) in cities like Nairobi and Cape Town shows how developed urban areas attract migration and contribute to population growth.

Moreover, inequality is a significant issue in cities like Kinshasa and Luanda, where income disparities force marginalized groups to migrate. The positive and significant coefficient for income inequality (Log Income Inequality: 0.9784) highlights wealth concentration in urban centres. In cities like Harare and Mogadishu, high youth unemployment (Log Youth Unemployment: 0.1854) further drives migration trends.

To address out-migration, targeted urban policies tailored to each city's challenges are necessary. Affordable housing programs and improved infrastructure can alleviate living costs in cities like Addis Ababa and Kampala. Cities like Lusaka, Juba, and Nairobi could benefit from policies promoting equitable economic growth, education, and youth job creation. Addressing these challenges will make SSA cities more inclusive and sustainable.

The estimates from Table 3 have important implications for Nairobi, where high living costs, agglomeration, and inequality drive out-migration. As the capital of Kenya, Nairobi experiences rapid urbanization and high housing demand. High living costs push low-income residents to the outskirts, reflecting the impact of slum populations and housing affordability (Log Slums, coefficient: 0.0029). Despite infrastructure improvements, congestion and unequal resource distribution contribute to migration patterns (Log Agglomeration, coefficient: -0.2041).

Similarly, income inequality is a major driver of urban migration in Nairobi, with wealth concentration limiting opportunities for low-income groups. The high coefficient for income inequality (Log Income Inequality: 0.9784) forces migration in search of better living standards. High youth unemployment (Log Youth Unemployment: 0.1854) further exacerbates migration trends. Hence, policies in Nairobi should focus on reducing income inequality, providing affordable housing, and creating job opportunities for the youth. Rural-urban integration, improved public services, and sustainable urban growth strategies are essential to address these challenges.

4.3 Robustness Check

The robustness of the results was assessed through Hansen's J-statistic test. First, alternative model specifications, including different lag structures and regional controls, confirmed that the key relationships between high living costs, urban agglomeration, and inequality remained consistent. Expanding the sample to include more cities like Kinshasa and Luanda did not alter the findings, indicating that the results are generalizable across different urban areas in SSA.

Instrument validity was confirmed through Hansen's J-statistic and serial correlation tests, ensuring no endogeneity issues. Placebo tests also showed no

significant effects, further validating the results. Non-linear relationships—particularly for GDP per capita and urbanization—were stable across different specifications. Sensitivity analyses with various data sources and time periods confirmed the robustness of the findings, supporting the conclusion that high living costs, inequality, and urbanization are key drivers of migration in SSA cities.

4.4 *Hansen's J-statistic*
The p-value of 0.183 follows Hansen's J-statistic for the two-stage least squares estimation model presented in Table 5.

Table 5: Hansen's J-statistic

Statistic	Value	P-value
Hansen's J-statistic	12.643	0.183

The results in Table 5 reveal the validity of the instruments taken up by the model, i.e., the consumption-investment instrumental variable does not necessarily correlate with the error term, meaning there is no over-identification in this model. This means that the model can actually analyses the drivers of urban out-migration in some cities across SSA; including Abidjan, Abuja, Accra, Addis Ababa, Cape Town, and many others.

5. Discussions
The findings of this study demonstrate that high living costs, urban agglomeration, and income inequality are significant determinants of urban out-migration in SSA cities. The descriptive statistics indicate that cities—such as Lagos, Kinshasa, and Johannesburg—experience elevated living costs due to rapid urbanization, high housing demand, and limited infrastructure; which compel low-income residents to relocate to peri-urban or secondary cities. Econometric results corroborate this pattern, with slum populations (Log Slums, coefficient 0.0029) and night-time lights (Log Night-Time Lights, coefficient 0.7356) being positively associated with out-migration; thereby highlighting the dual pressures of inadequate housing and rising consumption costs. Non-linear estimates reveal a threshold effect, whereby higher GDP per capita initially attracts migrants, but excessive wealth concentration and urban costs eventually drive out-migration (Log GDP per Capita^2 coefficient 0.543); indicating the paradoxical role of economic growth in migration dynamics.

Urban agglomeration exerts both attractive and repulsive effects on migration. While agglomerated cities provide employment opportunities, such issues as congestion, resource scarcity, and housing shortages push residents to less dense areas, as reflected by the negative coefficient for Log Agglomeration (-0.2041). Non-linear analysis suggests that beyond a certain population density, urban growth increases migration pressures (Log Urban Rate^2 coefficient 0.032), exemplified by cities such as Cape Town and Kigali, where rapid urbanization and resource strain

compel residents to seek more affordable and less congested locations. Income inequality is a persistent push factor, with both linear (0.9784) and non-linear (0.432) coefficients confirming that concentrated wealth in cities like Johannesburg and Lagos limits access to economic opportunities for low-income residents, motivating migration in search for more equitable living conditions.

High youth unemployment (coefficient 0.1854) and slum prevalence (coefficient 0.419) further amplify out-migration pressures, particularly in Kinshasa, Nairobi, and Lagos; where poor housing and limited economic prospects reinforce the push to peripheral or secondary cities. Food insecurity—averaging 4.990 across sampled cities—adds an additional layer of pressure, driving households toward areas with more reliable access to affordable food. Rural employment opportunities, especially in agriculture, provide a partial pull factor as indicated by the positive coefficient for Log Employment in Agriculture (0.763). However, the negative interaction between slum conditions and agricultural employment (-0.032) suggests that urban poor populations face constraints in transitioning to rural livelihoods, reflecting the limits of rural absorptive capacity.

6. Conclusions and Recommendations

This study examined the determinants of urban out-migration in SSA cities, focusing on the roles of high living costs, urban agglomeration, and income inequality. Based on descriptive statistics, linear and non-linear fixed-effects model estimations, and robustness checks, several key conclusions emerge. First, high living costs are a central driver of out-migration. Cities such as Lagos, Kinshasa, and Johannesburg exhibit elevated housing costs, intensified by rapid urbanization, informal settlements, and limited urban infrastructure. Empirical evidence shows that slum prevalence (Log Slums, coefficient 0.0029) and urban economic activity (Log Night-Time Lights, coefficient 0.7356) are positively associated with migration; indicating that residents facing high rents and inadequate living conditions are compelled to relocate to peri-urban or secondary cities. Non-linear estimates reveal that, beyond a certain threshold, high GDP per capita can paradoxically increase migration pressures due to rising inequalities and urban congestion (Log GDP per Capita^2 coefficient 0.543).

Second, urban agglomeration has a complex influence on migration. While agglomerated cities offer economic opportunities that attract migrants, the negative linear coefficient for agglomeration (Log Agglomeration, -0.2041) demonstrates that congestion, resource scarcity, and high living costs act as push factors. Non-linear effects (Log Urban Rate^2 coefficient, 0.032) suggest that the benefits of urban growth are initially positive but diminish as cities exceed manageable density levels, exemplified by Cape Town and Kigali, where overpopulation and resource strain drive migration to less dense areas.

Third, income inequality significantly contributes to migration patterns. The high mean Gini coefficient (0.81) across the sampled SSA cities indicates substantial wealth disparities. Both linear (0.9784) and non-linear (0.432) model

results confirm that inequality restricts access to opportunities for low-income populations, forcing migration toward more inclusive urban or peri-urban regions. This effect is compounded by youth unemployment (0.1854), food insecurity (-0.0131), and slum prevalence (0.419); which collectively exacerbate the pressures that push residents to relocate. Moreover, rural employment opportunities, particularly in agriculture (0.763), act as a partial pull factor. However, interactions with slum conditions (-0.032) suggest that the urban poor may face barriers in transitioning to rural livelihoods due to the lack of capital, skills, or social support networks.

Taken together, these findings highlight the multidimensional and interconnected nature of urban out-migration in SSA, where economic, spatial, and social factors converge to shape mobility patterns. The results are robust across linear and non-linear specifications, and Hansen's J-statistic confirms the validity of the instruments used, supporting the reliability of the conclusions across diverse SSA cities.

The findings have several important policy implications. First, affordable housing programs and investments in urban infrastructure are essential to reduce the pressure of high living costs in cities such as Lagos, Nairobi, and Johannesburg. Second, equitable economic policies, including measures to reduce income inequality and expand employment opportunities—particularly for the youth—are critical to limit forced migration. Third, rural-urban integration and support for peri-urban and secondary cities can help manage population distribution, alleviate congestion, and provide alternatives for urban dwellers. Fourth, sustainable urban planning that addresses density, congestion, and access to basic services is necessary to ensure inclusive urban growth. Finally, strengthening social safety nets and improving access to education, health, and food security: all can mitigate the push factors that drive migration from urban centres.

Data availability
The data for this study was obtained from the World Bank websites. The datasets utilized and examined throughout the study can be obtained by reaching out to the author, subject to reasonable request.

Declarations
Ethics Approval and Consent to Participate
The study was conducted in accordance with the ethical standards set out in the 1964 Declaration of Helsinki and its later amendments, or comparable ethical standards.

Informed Consent
Informed consent was obtained from all individual participants included in the study.

Competing Interests
The author declares no competing interests.

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