Tourism, Migration, And Productive Capacity Growth In Sub-Saharan Africa

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Abstract: Productive capacity has emerged as a critical indicator of long-term economic development, particularly for regions undergoing rapid structural transformation, such as Sub-Saharan Africa (SSA). Despite increasing global interest, the key drivers of productive capacity in SSA remain insufficiently explored, especially within the context of tourism and migration. Existing studies predominantly rely on GDP-based growth models and often examine tourism and migration separately, overlooking their combined influence on structural development. Moreover, the role of institutional quality in shaping productive capacity is under-investigated. This study examines how international tourism and migration affect productive capacity growth in SSA, while also considering the contributions of urbanization, trade openness, and institutional quality. Using panel data from 38 SSA countries between 2011 and 2021, the analysis employs a dynamic System Generalized Method of Moments (System GMM) estimator to address endogeneity, unobserved heterogeneity, and simultaneity among variables. The results indicate that international tourism and migration exert positive and statistically significant effects on productive capacity. Institutional quality emerges as the most influential driver, followed by urbanization and trade openness. These findings underscore the importance of structural and governance-related factors in enhancing the region's productive capacity. Tourism and migration contribute meaningfully to productive capacity growth; however, their impact is substantially conditioned by the quality of governance and structural enablers. Policymakers should adopt sustainable tourism strategies, strengthen security and infrastructure, develop migration-friendly frameworks, enhance human capital, and prioritize institutional reforms to maximize long-term productive capacity in SSA.

Keywords: Productive Capacity, International Tourism Receipts, Net Migration, System GMM, Growth In Sub-Saharan Africa

JEL Codes: F14; F63;F22; C23; C33

1. Introduction

Africa is widely recognized for its cultural diversity, natural landscapes, and rich historical heritage, attracting millions of visitors annually and positioning tourism as a major pillar of economic activity on the continent (Signe, 2018). At the same time, the region continues to experience substantial migration flows, as individuals relocate within and beyond their home countries in search of economic, social, and security-related opportunities (Agu & Orji, 2017; Dogru & Bulut, 2018). In Sub-Saharan Africa (SSA) in particular, rapid urbanization and evolving economic structures have intensified the need to understand how tourism and migration shape long-term development outcomes. As these sectors continue to grow in scale and complexity, examining their collective implications for sustainable economic transformation becomes increasingly important.

Although tourism and migration have been extensively studied, much of the existing literature treats them as independent economic forces and relies predominantly on gross domestic product (GDP) as the central measure of economic performance. However, in the context of SSA, a region characterized by rapid urban expansion, commodity price volatility, and persistent infrastructure deficits, GDP may provide an incomplete picture of development. GDP captures short-term production cycles and is highly susceptible to external shocks, making it less suitable for assessing structural transformation. This study, therefore, shifts the focus toward productive capacity growth, a more robust and long-term indicator of economic development that reflects the ability of an economy to produce goods and services efficiently. Notably, only a limited number of studies have explored the link between tourism, migration, and productive capacity, creating a critical gap in the literature.

According to UNCTAD (2021), sustainable economic growth depends on continual improvements in national productive capacity through advancements in technology, infrastructure, human capital, and overall productivity. The Productive Capacities Index (PCI) provides a multidimensional assessment of these components and is particularly relevant for SSA because it incorporates institutional quality, infrastructural development, and human capital, factors that underpin structural and inclusive growth (Yaya, 2024). By employing PCI, this study is able to evaluate how tourism and migration contribute not only to immediate economic outcomes but also to long-term resilience and diversification. This distinction is significant, as both tourism and migration are highly vulnerable to global shocks, including health crises such as the COVID-19 pandemic and fluctuations in international markets. Introducing PCI into this analytical framework thus adds conceptual depth and methodological value to existing scholarship.

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Recent trends underscore this need for a deeper investigation. Productive capacity growth in SSA declined from 4.1% in 2021 to 3.6% in 2022, with projections pointing to a further reduction to 3.1% in 2023. Despite its importance, empirical research examining the interaction between tourism, migration, and productive capacity remains scarce. Existing studies have primarily focused on tourism's role in stimulating job creation, foreign exchange earnings, and economic expansion. For example, the tourism sector contributed 8.5% to Africa's GDP in 2019 and generated over 24 million jobs (World Travel & Tourism Council, 2021). Although many scholars find a positive relationship between tourism and economic growth (e.g., Matthew et al., 2021), others highlight potential long-term risks, including overdependence on tourism revenues and the so-called "tourism resource curse" (Aliyev & Ahmadova, 2020). Moreover, tourism's effects differ across development levels, with some countries experiencing tourism-led growth and others displaying the opposite causal pattern (Ekeocha et al., 2021; Cárdenas-García, Brida, & Segarra, 2024).

Similarly, migration plays a significant yet complex role in shaping economic development. The number of international migrants reached 281 million in 2020, reflecting rising mobility worldwide (IOM, 2020). Evidence suggests that remittances, knowledge transfer, and human capital associated with migration can positively influence economic outcomes (Abeeb, Adewale, & Mathew, 2025; Azizi et al., 2024). Nonetheless, the effects of migration are heterogeneous and depend heavily on skill composition, policy frameworks, and host countries' absorptive capacities. Rapid urban migration can also strain public services and infrastructure, presenting governance challenges for SSA economies.

These mixed and often contradictory findings highlight the need for a more integrated analytical approach. The literature shows that the tourism–development and migration–development relationships vary significantly across contexts, suggesting that broader structural factors may condition these effects. Institutional quality, in particular, has emerged as a critical but understudied determinant. Although governance has been shown to influence tourism performance and migration outcomes, few empirical studies have comparatively examined its magnitude relative to tourism and migration within a dynamic, productivity-based growth framework (Adedoyin, Erum, & Bekun, 2022).

This study, therefore, introduces a key element of novelty by integrating tourism, migration, and six institutional quality indicators into a dynamic system GMM model to evaluate their collective and comparative effects on productive capacity growth in SSA. This approach allows for a more comprehensive assessment of the structural drivers of long-term development, moving beyond traditional growth metrics and isolated sectoral analyses. Through this framework, the study identifies the dominant policy levers necessary to enhance sustainable economic transformation in the region.

2. Literature Review

The relationship between tourism, migration, and productive capacity growth is anchored in several theoretical frameworks that together provide a strong conceptual foundation for the study's empirical model. These frameworks help explain both the direct and indirect channels through which tourism and migration influence long-term structural development in Sub-Saharan Africa (SSA).

A. Theories of Tourism

The study is primarily informed by the Tourism-Led Growth (TLG) Hypothesis, which posits a unidirectional causal relationship from tourism development to long-term economic expansion. According to this hypothesis, tourism receipts generate foreign exchange that can be reinvested in capital goods, infrastructure, and technology, thereby increasing productive efficiency through enhanced competition and economies of scale. Complementing this perspective is the Economic-Driven Tourism Growth (EDTG) Hypothesis, which reverses the causal pathway. This theory argues that tourism growth is a consequence, not a driver, of strong economic fundamentals. In this view, investments in human capital, institutional stability, and physical infrastructure create the conditions necessary for tourism to flourish.

Beyond these macroeconomic perspectives, micro-level theories provide further insight. Butler's Tourism Area Life Cycle (TALC) model describes the evolution of tourist destinations through predictable stages, from exploration and development to stagnation and decline or rejuvenation. This framework helps contextualize how tourism capacity, infrastructure, and institutional governance shape long-term development patterns. Additionally, Cultural Tourism Theory emphasizes the role of cultural assets as key attractors of international visitors. It suggests that the preservation and strategic utilization of cultural heritage can stimulate related industries, thereby improving local productive capacity and contributing to a more diversified economy.

B. Theories of Migration

Migration theories help explain both the determinants of human mobility and the economic implications for sending and receiving regions. The Push–Pull Theory provides a foundational explanation, attributing migration flows to adverse socio-economic conditions in home countries (push factors) and more favorable opportunities in destination regions (pull factors). This framework is particularly relevant for SSA, where inequalities in employment opportunities, political instability, and environmental conditions often drive migration decisions. From an economic standpoint, Neoclassical Economic Theory views migration as an individual, rational choice aimed at maximizing expected income. In contrast, the New Economics of Migration Theory expands this view by positioning migration as a household-level risk diversification strategy, especially in contexts where financial markets and insurance mechanisms are underdeveloped.

The Relative Deprivation Theory adds a sociological dimension, proposing that individuals migrate not solely to improve absolute income but also to enhance their status relative to peers or societal averages. This comparative motivation is especially pertinent in urban and rapidly developing contexts within SSA. Together, these theories highlight the complex motivations behind migration and the potential economic spillovers, from human capital accumulation to remittances, that may influence productive capacity over time.

C. Theories of Productive Capacity Growth

The study's focus on productive capacity growth is grounded in several structural development theories. Human Capital Theory provides a foundational explanation, asserting that investments in education, training, and skills development are critical drivers of productivity and innovation. In the context of tourism and migration, both sectors contribute to human capital

accumulation through knowledge transfer, workforce development, and enhanced labor mobility.

Furthermore, Institutional Theory underscores the role of governance structures, regulatory frameworks, and political stability in shaping economic outcomes. Effective institutions create conducive environments for tourism development and enable productive utilization of migrant skills. Strong governance facilitates investment, reduces uncertainty, and supports the long-term processes necessary for productive capacity enhancement. Conversely, weak institutions can hinder the economic benefits of tourism and migration by misallocating resources or discouraging investment. This collection of theoretical insights forms the foundation for the study's empirical examination of how tourism, migration, and institutional quality jointly influence productive capacity growth in Sub-Saharan Africa. The integration of these frameworks allows for a multidimensional understanding of development processes, aligning with the study's dynamic modeling approach.

2.1. Empirical Literature

The empirical literature examining the relationship between tourism, migration, and economic growth in Sub-Saharan Africa (SSA) reveals varied and often contradictory findings. This section synthesizes existing studies across three thematic areas to contextualize the current research.

A. Tourism and Economic Growth

The tourism-led growth hypothesis (TLGH) remains central to empirical research on tourism and development. Several studies report a significant and positive association between tourism and economic expansion. For example, Matthew et al. (2021) show that tourism receipts enhance growth by stimulating foreign exchange earnings and promoting investment in human and physical capital. Similar evidence from a multi-country analysis by Ansari (2025) confirms that tourism positively influences long-term economic performance. Kumar et al. (2022) further observe that positive tourism shocks foster growth, although negative shocks tend to have limited adverse effects. Recent reviews, such as Alcalá-Ordóñez and Segarra (2025), broaden this perspective by suggesting that tourism contributes not only to GDP but also to socio-economic development outcomes such as poverty reduction, inequality mitigation, and improved living standards.

However, the evidence is not uniform. Certain studies challenge the TLGH by identifying potential adverse effects. Nyasha, Odhiambo, and Asongu (2021), for instance, report that tourism expenditure negatively affects growth in SSA. Aliyev and Ahmadova (2020) describe a similar pattern in Georgia, referring to it as a "tourism resource curse," where excessive reliance on tourism revenue undermines long-term development. Environmental considerations further complicate the picture. Agyeman et al. (2022) find that while tourism may enhance economic activity, it simultaneously increases CO_2 emissions, raising sustainability concerns. Causality patterns also differ across development contexts. Cárdenas-García, Brida, and Segarra (2024) show that tourism drives development in low-specialization countries, whereas in highly developed tourism economies, development stimulates tourism. Institutional quality emerges as a critical moderating factor. Adedoyin, Erum, and Bekun (2022) demonstrate that weak governance can reverse tourism's positive development effects, as corruption and inefficiencies hinder the productive use of tourism revenues. These findings collectively indicate that the tourism–growth nexus in SSA is highly context-dependent.

B. Migration and Economic Growth

Empirical evidence on migration's contribution to economic growth is similarly mixed. Several studies document positive effects, particularly through remittances and human capital accumulation. Abeeb, Adewale, and Mathew (2025) find that both migration and remittances significantly enhance Nigeria's economic growth by supporting productive investment. Azizi et al. (2024) likewise report that remittances stimulate growth in developing economies with strong human capital foundations. Shelton (2021) highlights the importance of financial-sector development, noting that remittances exert stronger effects when supported by robust financial institutions.

The skill composition of migrants also matters. Research by Oliinyk et al. (2021) and Strzelecki, Growiec, and Wyszyński (2022) shows that the inflow of highly skilled workers boosts innovation, competitiveness, and economic efficiency. In contrast, studies on low-skilled or refugee migration present more nuanced outcomes. Tanrikulu (2020), examining Syrian refugees in Turkey, finds that low-skilled inflows may initially generate inflationary pressures and strain labor markets if integration mechanisms are weak. Ari (2021) identifies unidirectional causality from migration to growth in Turkey, particularly within labor-intensive sectors such as agriculture, construction, and services. Together, these findings underscore the heterogeneous nature of migration's economic impacts, moderated by skill levels, absorptive capacity, and policy frameworks.

C. Empirical Evidence on Productive Capacity

Productive capacity, the structural ability of an economy to produce goods and services, is increasingly recognized as a cornerstone of sustainable growth. A growing body of empirical research examines its determinants. Oluc et al. (2023) investigate the dynamic relationship between productive capacity and environmental outcomes using a PMG-ARDL model for 38 OECD countries. Their findings suggest that enhanced productive capacity reduces environmental degradation. Peng, Ji, and Kong (2023) show that outward foreign direct investment (OFDI) strengthens firm-level productive capacity, particularly where human capital and technological capabilities are well developed. Saha (2023) identifies productive capacity as a key moderator in the relationship between foreign direct investment (FDI) and labor productivity, demonstrating that the effects of FDI depend on a country's initial structural conditions.

Human capital remains a central driver. Shiferaw (2017) attributes Ethiopia's productive capacity gains primarily to domestic investment, though persistent skills gaps remain a challenge. Tchamyou et al. (2019) similarly emphasize the importance of entrepreneurship, education, and human capital in strengthening productive capacity across African economies. Collectively, these studies highlight the multifaceted determinants of productive capacity and the importance of structural, human, and institutional foundations.

2.2. Gaps in the Literature and Value Addition

Despite extensive research on tourism, migration, and economic growth, several important gaps remain, particularly concerning the SSA context. First, most empirical studies are either country-specific or treat SSA as a homogeneous group, overlooking substantial regional diversity. This limits the generalizability of findings and obscures important contextual

drivers. The present study addresses this gap by employing a dynamic system GMM framework to conduct a region-wide, comparative analysis across SSA. This approach helps uncover differentiated patterns and identify context-specific drivers of productive capacity growth.

Second, existing literature rarely integrates tourism, migration, and institutional quality into a unified analytical framework. Although prior studies acknowledge the importance of governance, few have examined institutional quality as a potential moderating factor shaping how tourism and migration influence long-term structural development (Adedoyin et al., 2022; Agyeman et al., 2022). This study fills this gap by explicitly incorporating six institutional quality indicators, allowing for a more rigorous comparative assessment of their relative and combined impacts. By addressing these limitations, the study advances the literature by moving beyond conventional growth metrics and isolated variable analyses. Through its comparative and institutionally grounded approach, it offers a more comprehensive understanding of the mechanisms through which tourism, migration, and governance jointly influence productive capacity in SSA, thereby providing more targeted and effective policy insights.

3. Methodology

3.1 Theoretical Framework

The theoretical foundation of this study is anchored in Neoclassical Growth Theory, which emphasizes technological progress as a central driver of long-term economic growth and productive capacity. According to this framework, advancements in technology enhance the efficiency with which economies utilize capital and labor, thereby increasing their ability to produce goods and services over time. In the context of Sub-Saharan Africa (SSA), this theoretical lens is particularly relevant, as both tourism and migration contribute to technological diffusion and capacity enhancement through several channels.

Within the tourism sector, technological improvements in transportation, communication, digital services, and infrastructure can raise productivity and strengthen competitiveness (Pencarelli, 2020). Tourism development often requires substantial investment in these sectors, which subsequently enhances broader productive capacity. Similarly, migration facilitates the transfer of skills, knowledge, and technological innovations from destination countries to origin regions through mechanisms such as remittances, return migration, and transnational networks (Beine et al., 2016). This knowledge and technology spillovers align with the Neoclassical perspective, which views human capital accumulation and technological diffusion as engines of sustainable productivity growth.

From an econometric standpoint, studies examining growth dynamics frequently confront the challenge of endogeneity, which arises when explanatory variables are correlated with the error term. This violates the classical assumption of strict exogeneity and leads to biased and inconsistent parameter estimates. Endogeneity may occur due to omitted variables, measurement error, or simultaneity. For instance, variables such as trade openness and institutional quality may both influence and be influenced by productive capacity. Higher productive capacity can strengthen institutional structures, and improved governance can, in turn, enhance productive capacity, creating a feedback loop that standard estimation techniques cannot adequately capture.

Given these issues, relying on Ordinary Least Squares (OLS) or Fixed Effects (FE) estimators would yield inconsistent results in this dynamic context. To address simultaneity, omitted variable bias, and unobserved heterogeneity, this study employs the System Generalized Method of Moments (System GMM) estimators developed by Arellano and Bover (1995) and Blundell and Bond (1998). System GMM is particularly well-suited for panels with a relatively short time dimension and potential endogeneity among regressors.

The strength of System GMM lies in its use of internal instruments derived from lagged values of the variables in both the level and first-difference equations. This dual-equation system imposes additional moment conditions, enhancing the efficiency and consistency of the estimates. Moreover, System GMM effectively controls for unobserved country-specific effects, mitigates simultaneity bias, and accommodates heteroscedasticity within the dataset. These properties make it an appropriate and robust estimation technique for analyzing the dynamic relationship between tourism, migration, institutional quality, and productive capacity growth in SSA.

Thus, in a dynamic framework, the growth equation can be written as follows in 4.1;

$$y_{it} = \alpha + \gamma_1 ln y_{it-1} + \beta'[X]_{it} + \lambda_i + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.1)$$

Where y_{it} is the difference in output per capita as the dependent variable, and $ln y_{it-1}$ is the lagged dependent variable and X_{it} is the vector of explanatory variables, ε_{it} error term that has constant means, E $[\varepsilon_{it}] = 0$. Other variables remain as defined earlier. And i = 1, …... N., and t = 2, ……, T. Also, $[\lambda_i + \varepsilon_{it}]$ is the standard error component. We assume that E $[\lambda_i] = 0$, E $[\varepsilon_{it}] = 0$ $[\lambda_i + \varepsilon_{it}] = 0$ if we take the first difference of the equation.

3.2 Model specification

To satisfy the objective of this study, panel data for 38 Sub-Saharan (SSA) Countries were generated from 2011 to 2021. The data were sourced from the World Development Index (2021) and UNCTAD (2021). STATA 15.0 econometric software package is used to conduct the system GMM model, with the model specified as follows:

$$PCI_{it} = f\left(PCI_{i,t-1}, TOR_{it}, MIG_{it}, URB_{it}, RE_{it}, TOP_{it}, INST_{it} \right) \ldots\ldots\ldots\ldots\ldots\ldots (4.2)$$

Where:

PCI= Productive Capacity Index (PCI) (indexed across individual units and time)

$PCI_{i,t-1}$= One period Lag of Productive Capacity Index

TOR= International tourism, receipts (% of total exports)

MIG: Net Migration (number of immigrants minus the number of emigrants)

URB: Urbanization (the increasing proportion of a country's population that resides in urban areas)

RE: Renewable energy consumption (% of total final energy consumption)

TOP: Trade openness (sum of exports and imports of goods and services measured as a share of GDP).

INST: Institutional Quality Index (encompasses the six governance indicators: governmental effectiveness, rule of law, regulatory quality, voice and accountability, control of corruption, and political stability).

To fit a linear model with one dynamic variable ($PCI_{i,t-1}$), we take the log of some variables in equation (4.3) and add the dynamic variable;

$$InPCI_{it} = \alpha InPCI_{i.t-1} + \beta_1 InTOR_{it} + \beta_2 InMIG_{it} + \beta_3 lnURB_{it} + \beta_4 lnRE_{it} + \beta_5 lnTOP_{it} + \beta_6 INST_{it} + \theta_i + v_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.\ldots\ldots. (4.3)$$

θ_i represents the unobserved inter-country characteristics that differ across the countries but are fixed over time. The presence of the unobserved heterogeneity leads to endogeneity bias under the fixed effect assumption that the unobserved country characteristics are correlated with the explanatory variables. v_{it} is the within-country error term. To address the endogeneity problem, equation (4.3) is transformed by first differencing, thus eliminating the country fixed effect. The first difference transformation of equation (4.3) becomes:

$$\Delta InPCI_{it} = \alpha \Delta InPCI_{i.t-1} + \lambda_1 \Delta InTOR_{it} + \lambda_2 \Delta InMIG_{it} + \lambda_3 \Delta lnURB_{it} + \lambda_4 \Delta lnRE_{it} + \lambda_5 \Delta lnTOP_{it} + \lambda_6 \Delta INST_{it} + \Delta v_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.\ldots. (4.4)$$

Where Δ is the first difference operator showing that all the variables are in their first difference? To ensure the model fully accounts for both unobserved country characteristics and macro-level shocks, the model accounts for country fixed effects through the first-difference transformation, capturing all unobserved time-invariant characteristics (e.g., geography) that could otherwise bias the estimates. Furthermore, time fixed effects are also included in the model.

4. Empirical Results

Table 1: Summary Statistics

Variables	Observations	Mean	Std. Dev	Minimum	Maximum
LPCI	342	3.16856	0.1622289	2.870757	3.621379
LTOR	342	1.772417	1.627376	-6.952549	4.293108
LMIG	342	9.250381	2.037364	5.501258	13.377
URB	342	2.390007	3.38007	87441	1.98008
RE	342	63.22556	25.81633	0.71	97.03
TOP	342	68.6758	34.16524	15.28167	222.0819
GE	342	-0.6901933	0.6148105	-1.809393	1.150494
RL	342	-0.6023552	0.5933083	-1.837632	1.023956
RQ	342	-0.5792693	0.5715951	-2.001824	1.196947
VC	342	-0.459048	0.7029412	-1.84886	0.9750996
CC	342	-0.580602	0.6547077	-1.597468	1.141893
PS	342	-0.5039312	0.8454238	-2.665278	1.104041

Source: Author's compilation using STATA 15.0 output.

Table 1 shows the summary statistics of the variables used in the study, with particular reference to the mean, standard deviation, minimum, and maximum values of the variables.

Productive capacity (LPCI) has a mean value of 3.16856 with a standard deviation of 0.162. The mean value alludes to the already established low ranking of African economies in the world's productive capacity ranking. International tourism receipts (LTOR) record a mean value of 1.772417 but varied from a minimum of -6.952549 in one country to a maximum of 4.293108 in another. Other variables follow similar interpretations, according to their respective values, which are provided in the table. Overall, the mean and median are within a close range, indicating that there are no outliers in the dataset.

Table 2: Correlation Matrix

	PCI	TOUR	MIG	URB	RE	TOP	GE	RL	RQ	VC	CC	PS
PCI	1.00											
TOUR	0.37	1.00										
MIG	-0.31	-0.24	1.00									
URB	-0.27	-0.10	0.45	1.00								
RE	-0.80	-0.31	0.31	0.38	1.00							
TOP	0.59	0.06	-0.57	-0.45	-0.60	1.00						
GE	0.86	0.47	-0.34	-0.25	-0.77	0.56	1.00					
RL	0.81	0.52	-0.37	-0.30	-0.67	0.43	0.93	1.00				
RQ	0.77	0.34	-0.37	-0.31	-0.67	0.39	0.87	0.90	1.00			
VC	0.63	0.33	-0.44	-0.31	-0.63	0.35	0.74	0.76	0.86	1.00		
CC	0.79	0.44	-0.53	-0.31	-0.70	0.62	0.92	0.91	0.84	0.73	1.00	
PS	0.68	0.30	-0.53	-0.67	-0.63	0.59	0.73	0.77	0.78	0.74	0.73	1.00

Source: Author's compilation using STATA 15.0 output.

To explore the associations between these variables, Table 2 provides the results for the correlation matrix. This matrix reveals the absence of significant correlations among the governance institutional variables. This outcome aligns with the assertion of Gujarati and Porter (2003), who noted that multicollinearity becomes a concern when correlation values approach or exceed +/- 0.80. Furthermore, the study enhances the reliability, precision, and interpretability of the regression models by examining the variance inflation factor (VIF). The VIF analysis demonstrates that multicollinearity is not a prevalent issue in the models. It is essential to note that, as a general guideline, to demonstrate uncorrelated repressors, the tolerance value should be above 2 but below 5. This further supports the robustness of our finding.

The result in Table 3 below shows the result for the cross-sectional dependency test. The test was carried out to prevent inefficient and misleading estimates, as noted by Pesaran et al. (2020) and Friedman (1953). Furthermore, the test is appropriate because the number of cross-sectional units exceeds the number of time periods (N > T). This is supported by Dong et al.

(2018). The result presented in Table 3 below strongly indicates a dominant presence of cross-sectional independence within the study's panel. However, had there been evidence of cross-sectional dependency in the panel, the system GMM framework would have addressed this by simply integrating time effects into the model, following the methodology outlined by Tchamyou et al. (2019) and Asongu & Nting (2021).

Table 3: *Cross-sectional Dependence Tests*

Ln Equation	GE	RL	RQ	CC	PS
Pesaran-fe	0.1129	0.1190	0.1100	0.0018	0.1128
	(0.413)	(0.415)	(0.408)	(0.404)	(0.291)
Pesaran-re	0.1165	0.1117	0.1192	0.1154	0.1153
	(0.417)	(0.417)	(0.417)	(0.417)	(0.280)
Friedman-fe	1.0000	1.0000	1.0000	1.0000	1.0000
	(0.663)	(0.647)	(0.668)	(0.667)	(0.305)
Friedman-re	1.0000	1.0000	1.0000	1.0000	1.0000
	(0.659)	(0.648)	(0.664)	(0.653)	(0.295)
Pesaran-fe	0.1128	0.1197	0.1150	0.0017	0.1129
	(0.513)	(0.315)	(0.608)	(0.504)	(0.321)
Pesaran-re	0.1565	0.1317	0.1492	0.1454	0.1353
	(0.417)	(0.417)	(0.417)	(0.417)	(0.280)
Friedman-fe	1.0000	1.0000	1.0000	1.0000	1.0000
	(0.653)	(0.637)	(0.668)	(0.367)	(0.305)
Friedman-re	1.0000	1.0000	1.0000	1.0000	1.0000
	(0.959)	(0.248)	(0.764)	(0.453)	(0.295)
Pesaran-fe	0.1129	0.1190	0.1100	0.0018	0.1128
	(0.413)	(0.515)	(0.008)	(0.405)	(0.271)
Pesaran-re	0.1165	0.1117	0.1192	0.1154	0.1153
	(0.417)	(0.317)	(0.317)	(0.417)	(0.250)
Friedman-fe	1.0000	1.0000	1.0000	1.0000	1.0000
	(0.563)	(0.447)	(0.468)	(0.467)	(0.405)
Friedman-re	1.0000	1.0000	1.0000	1.0000	1.0000
	(0.259)	(0.548)	(0.464)	(0.553)	(0.395)
Decision	CID	CID	CID	CID	CID

Source: Authors. Note: For both Pesaran and Friedman, the reported values are the p-values for the tests; the average absolute values are provided in parentheses. **Note:** *CID denotes cross-sectional independence.*

Table 4: *System GMM Estimation (Dependant Variable is PCI; 33 countries, 2011-2021)*

Regressors	Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6
L.PCI-1	0.8929***	0.8971***	0.8722***	0.8975***	0 .8250***	0.9206***
	0	0	0	0	0	0
LTOR	0.0202**	0.0062*	0.0965***	0.0944**	0.0348	0.0677
	-0.034	-0.069	-0.01	-0.038	-0.624	-0.118
LMIG	0.0021**	0.0300*	0.0494**	0.0239	0.0753	0 .0268
	-0.055	-0.065	-0.035	-0.074	-0.152	-0.499
LURB	3.1901*	1.5200***	1.98	1.99	8.1301	3.4000*
	-0.074	-0.014	-0.227	-0.203	-0.678	-0.09
LRE	0.0035	-0.0012	-0.0019	-0.0041	-0.0039	-0.0024
	-0.423	-0.857	-0.761	-0.482	-0.659	-0.63
LTOP	0.0008	0.0039**	0.0061***	0.0045	-0.0003	0.0035**
	-0.539	-0.037	-0.014	-0.157	-0.896	-0.025
GE	0.9842***					
	0					
RL		0.7364***				
		0				
RQ			0.7159***			
			0			
VC				0.2841**		
				-0.053		
CFC					1.1359***	
					0	
POL						0.2137***
						-0.032
Constant	3.2631	2.6626	2.732	2.3004	4.7063	1.6818
	-0.122	-0.285	-0.252	-0.276	-0.095	-0.311
F-stat	14001.00***	27980.56***	9680.40***	2860.58***	2807.08***	10891.92***
	0	0	0	0	0	0
Instruments	15	15	15	15	15	15
VIF	2.25	1.98	1.94	2	2.12	2.1
AR(1)	0.05	0.043	0.04	0.042	0.036	0.037
AR(2)	0.945	0.797	0.772	0.858	0.996	0.88
Sargan	0.063	0.025	0.049	0.03	0.083	0.026
Hansen	0.2	0.114	0.164	0.325	0.186	0.193

*Source: Authors' Construct from STATA Output. Note: ***, **, and * denote significance levels of 1%, 5%, and 10% respectively.*

Table 4 presents the estimation results from the System GMM model, which includes six panels, each incorporating one institutional quality indicator. Across all models, the constant term is statistically insignificant, indicating that baseline productive capacity, absent the effects of lagged productivity and explanatory variables, does not differ significantly from zero. However, the lagged dependent variable (L.PCI-1) consistently exhibits a highly significant and positive coefficient across all panels, confirming strong persistence in productive capacity. This result aligns with theoretical expectations: improvements in productive capacity in one period substantially reinforce future capacity, reflecting the cumulative and path-dependent nature of structural development in Sub-Saharan Africa (SSA). The statistically significant F-statistics further confirm that the explanatory variables jointly contribute to explaining productive capacity dynamics.

The results indicate that international tourism exerts a positive and statistically significant effect on productive capacity in Panels 1–4. The coefficients, ranging from 0.0062 to 0.0965, suggest that increases in tourism receipts contribute to incremental improvements in productive capacity. Although the magnitudes are relatively small, the positive sign is consistent with studies such as Matthew et al. (2021) and Orji and Agu (2018), which argue that tourism can stimulate infrastructure development, employment generation, and local business growth.

The small magnitude of these coefficients warrants careful interpretation. Tourism's direct contribution to productive capacity remains limited, likely due to structural bottlenecks such as revenue leakages, weak value chain integration, and low levels of domestic manufacturing. As noted by Aliyev and Ahmadova (2020), tourism-led development is sensitive to institutional quality, and without robust governance frameworks, its transformative influence on long-term productive capacity remains constrained. Thus, while tourism creates opportunities for SSA economies, the results emphasize the need for institutional reforms and strengthened value-chain linkages to maximize tourism's developmental impact (Agu, Orji, & Onodugo, 2017).

Migration also exhibits a positive and significant relationship with productive capacity, with coefficients of 0.0021, 0.0300, and 0.0494 across Panels 1–3. Although the magnitudes differ, the results collectively indicate that migration contributes to enhancing productive capacity through channels such as remittances, knowledge transfer, entrepreneurship, and expanded labor supply. These findings are consistent with evidence from Abeeb, Adewale, and Mathew (2025) and Azizi et al. (2024), which highlight migration's role in boosting investment and human capital formation. Importantly, while the coefficients remain smaller than those of institutional variables, their significance suggests that well-designed migration policies can strengthen SSA's productive capacity. Effective integration policies, diaspora engagement, and return-migration programs may further amplify these gains.

One of the most notable findings in Table 4 is the substantial difference between the coefficients of institutional variables and those of economic drivers such as tourism, migration, and trade. All institutional indicators exhibit large, positive, and statistically significant coefficients. For example, Control of Corruption (1.1359) and Government Effectiveness (0.9842) demonstrate an order of magnitude greater impact than tourism or migration. A coefficient greater than one, such as that for Control of Corruption, implies that a one-unit improvement in governance produces a more than proportional increase in productive capacity. This supports the "Institutions First" argument within development economics. As emphasized by Adedoyin, Erum, and Bekun (2022), effective institutions are not merely complementary to growth; they are foundational to enabling and scaling the benefits of tourism, migration, and other economic activities. These results affirm that institutional quality, including political stability, regulatory effectiveness, and rule of law, is a critical determinant of productive capacity in SSA. Strengthening governance systems is therefore essential to ensuring that the gains from tourism and migration translate into sustained structural transformation.

Urbanization demonstrates a positive and significant impact on productive capacity in Panels 1, 2, and 6. This aligns with theoretical expectations: urban centers facilitate agglomeration economies, labor market efficiencies, knowledge spillovers, and increased access to services. The results underscore the importance of integrated urban policies that promote infrastructure development, innovation hubs, and inclusive economic planning. Trade openness also exhibits significant positive coefficients (0.0039, 0.0061, and 0.0035 across panels 2, 3, and 6), suggesting that increased participation in global trade enhances productive capacity. These findings are consistent with Peng, Ji, and Kong (2023) and Saha (2023), who note that trade can stimulate technology diffusion, learning, and investment.

Diagnostic tests confirm the validity and reliability of the System GMM estimations. The Hansen test of overidentifying restrictions is insignificant across all panels (Hansen p-value > 0.05), indicating that the instruments employed are valid and uncorrelated with the error term. Furthermore, the Arellano-Bond test for second-order serial correlation (AR(2)) is also insignificant (p-value > 0.05), suggesting that there is no residual autocorrelation in the differenced error term. This validates the moment conditions and confirms the appropriateness of the System GMM methodology for this study.

5. Discussion

The findings of this study provide important insights into the structural determinants of productive capacity growth in Sub-Saharan Africa (SSA). Overall, the results suggest that while tourism and migration contribute positively to productive capacity, institutional quality remains the most influential factor. This reinforces the argument that structural development in SSA is shaped not only by economic activity but also by the strength of governance systems that support and regulate that activity.

The positive yet modest effect of international tourism on productive capacity aligns with the Tourism-Led Growth Hypothesis, which posits that tourism stimulates investment, foreign exchange earnings, and employment. However, the relatively small coefficients observed in this study highlight the constraints that weaken tourism's transformative potential in SSA. Issues such as inadequate infrastructure, high import dependence, weak value-chain linkages, and service quality gaps may limit the extent to which tourism revenue translates into productive, long-term structural improvements. These results are consistent with studies that caution against overreliance on tourism in contexts where institutional and infrastructural foundations are weak.

Migration also demonstrates a positive relationship with productive capacity, supporting the view that remittances, skill transfer, and labor mobility can stimulate human capital development and entrepreneurial activity. This finding is aligned with the New Economics of Labor Migration and studies emphasizing the developmental role of diasporas (Agu, Orji, & Onodugo). Nevertheless, the moderate size of the coefficients suggests that SSA countries may not be fully leveraging the economic

benefits of migration. Challenges such as brain drain, limited reintegration programs, and weak mechanisms for channeling remittances into productive investment may dampen migration's potential contribution.

The most striking finding is the magnitude of the institutional quality coefficients, which far exceed those of economic variables. Indicators such as control of corruption, government effectiveness, and regulatory quality demonstrate large and significant impacts on productive capacity. This supports the "Institutions First" perspective in development economics, which argues that effective governance is foundational to sustainable economic transformation. Strong institutions not only promote efficient resource allocation but also create an enabling environment in which tourism, migration, trade, and urbanization can generate lasting developmental gains. Conversely, weak institutions contribute to revenue leakages, inefficiencies, and underinvestment, limiting the returns from economic activities.

Urbanization and trade openness also show positive effects, indicating that structural shifts toward urban economies and expanded global trade can improve productive capacity. These findings align with empirical evidence showing that urban agglomerations facilitate innovation and productivity, while international trade supports technology transfer and competitiveness. The insignificant relationship between renewable energy consumption and productive capacity suggests the presence of infrastructural or regulatory constraints that impede the effective translation of clean energy investments into structural gains. This finding underscores the need for deeper inquiry into the energy–productivity nexus in SSA. Collectively, the findings of this study highlight the interdependence between economic drivers and institutional structures. While tourism and migration contribute to productive capacity, their impacts are significantly amplified or constrained by the quality of governance. Strengthening institutional frameworks is therefore essential for maximizing the developmental returns from these sectors.

6. Policy Implications

The empirical findings of this study demonstrate that both tourism and migration exert significant positive effects on productive capacity growth in Sub-Saharan Africa. The positive impact of international tourism suggests that strengthening tourism-linked infrastructure, promoting sustainable tourism practices, and ensuring environmental conservation can enhance structural development. Increased tourism activity stimulates job creation, expands demand for domestic goods and services, and supports economic diversification, key elements for improving productive capacity in the region.

Migration also contributes positively to productive capacity, indicating that well-designed migration policies are essential. Policymakers should address both the push and pull factors that shape migration decisions by prioritizing human capital development, job creation, labor market reforms, and infrastructural improvements. By advancing regional economic integration and establishing supportive frameworks for skill mobility, SSA countries can better harness migration-driven benefits such as innovation, entrepreneurship, and demographic revitalization.

These findings underscore the broader role of structural variables, such as security, human capital, infrastructure, innovation, and institutional quality, in shaping productive capacity outcomes. Future research may further explore how these elements interact with tourism and migration to strengthen SSA's long-term development trajectory.

7. Policy Recommendations

Drawing on the study's empirical results, several policy recommendations emerge: Given the significant relationship between tourism receipts and productive capacity, African governments should invest in unlocking the continent's largely untapped tourism potential. This requires coordinated efforts, possibly through African Union frameworks, to address key deterrents such as insecurity, weak infrastructure, and inadequate service quality. Investment in dual-purpose infrastructure (e.g., transport networks and digital systems) will not only enhance tourism competitiveness but also stimulate job creation and support domestic value chains, thereby improving long-term productive capacity.

To strengthen the positive contribution of migration, policymakers should adopt comprehensive strategies centered on human capital retention and productive engagement of the diaspora. This includes aligning education and skills development with labor market needs, improving employment opportunities, and establishing migration-friendly policies. Diaspora engagement mechanisms, such as returnee programs, investment platforms, and diaspora bonds, can channel remittances and skills toward productive, long-term development priorities.

The insignificant relationship between renewable energy consumption and productive capacity suggests structural barriers limiting the sector's contribution. Policymakers, energy ministries, and development partners such as the African Development Bank should support targeted research on issues such as high technology costs, regulatory bottlenecks, and grid infrastructure limitations. Addressing these barriers will be essential to ensuring that clean energy adoption strengthens structural transformation.

Finally, the study's findings highlight the fundamental role of institutional quality in shaping productive capacity. Strengthening governance, through improved anti-corruption frameworks, enhanced rule of law, accountability mechanisms, and political stability, is critical. Tailored institutional reforms will ensure that gains from tourism, migration, and trade translate into sustainable and equitable structural development.

8. Conclusions

This study provides empirical evidence on the relationships among tourism, migration, institutional quality, and productive capacity growth in Sub-Saharan Africa using a dynamic System GMM approach. The results show that both tourism and migration positively influence productive capacity, but institutional quality exerts the most substantial impact, highlighting its central role in enabling structural transformation. Urbanization and trade openness also contribute positively, reinforcing the importance of interconnected development drivers. The study advances the literature by integrating tourism, migration, and multiple institutional indicators into a unified analytical framework, offering a more holistic understanding of productive capacity dynamics in SSA. The findings underscore the need for coordinated policies that strengthen governance systems, promote sustainable tourism, harness migration benefits, and address structural bottlenecks in infrastructure and energy.

Future research may build on these findings by exploring sub-regional differences, sector-specific effects, and the role of emerging technologies in shaping productive capacity. Such insights will be crucial for designing evidence-based strategies aimed at achieving inclusive and sustainable development across the continent.

Data availability statement: Data is available upon request. Please contact the corresponding author for any additional information on data access or usage.

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