

ISTANBUL CONFERENCE ON ECONOMICS AND SOCIETY (ISTCES) 2025

*Pathways to Inclusive Growth: Overcoming Challenges in
Emerging and Developing African Countries.*

24-26 SEPTEMBER 2025

Book of Proceedings

Editors

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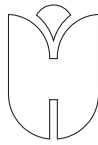
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Preface

It is with a profound sense of accomplishment and gratitude that we, the Department of Economics at Ibn Haldun University, present this abstract volume from the inaugural Istanbul Conference on Economics and Society (ISTCES). Held from September 24th to 26th, 2025, the conference brought a distinguished group of scholars, policymakers, and practitioners to our campus. It was a privilege to host such a vital conversation in Istanbul, a city that has always been a crossroads of ideas and cultures.

At the heart of our conference was a critical inquiry into its theme, “Pathways to Inclusive Growth: Overcoming Challenges in Emerging and Developing African Countries.” The discussions across the three days were not merely academic; they were a deep and necessary engagement with the complexities of unequal growth and its threat to long-term stability. Participants confronted the significant hurdles that persist from the economic shocks of recent global events to the escalating burden of debt and the existential challenge of climate change reaffirming that the pursuit of inclusive, sustainable development has never been more urgent.

For those three days, our campus was transformed into a vibrant hub of intellectual exchange. The inaugural ISTCES provided a dedicated forum where a diverse group of experts shared insights, debated strategies, and collaboratively explored innovative solutions tailored to the unique contexts of African nations. The intellectual energy was palpable, and the vibrant exchange of ideas sowed the seeds for new and lasting collaborations. We are particularly proud that the conference helped forge stronger ties among African scholars and between the research communities of Africa and Turkey.

A conference of this nature is a collective endeavor, and its success belongs to every individual who contributed. We extend our deepest gratitude to all our participants for their insightful contributions and spirited

engagement, which made this inaugural event memorable. It is our sincere hope that the partnerships forged, and the ideas exchanged will continue to flourish, contributing to a future of shared prosperity for the African continent.

Sincerely,

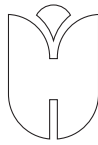
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Abstracts



1.

Transformative Pathways: Understanding Economic Growth in Africa using the African Transformation Index

Eugene Msizi Buthelezi¹

Despite its significance for inclusive growth, the literature tends to overlook the role of structural transformation in African economies. Using the African Transformation Index (ATI), this study seeks to address this gap and highlight the importance of structural changes in driving growth. This study uses panel data from 30 African countries from 2000 to 2022. Employing the Cobb-Douglas production function and panel quantile regression. It found that ATI positively impacts GDP per capita growth rates, notably at lower quantiles, emphasizing structural transformation's role in inclusive growth. Diversification negatively affects growth, suggesting challenges in overly diversified economies. Export competitiveness and productivity enhancements positively influence growth, while technology upgrading's impact is significant mainly at lower quantiles, signaling the need for targeted policies. Human wellbeing emerges as a crucial growth driver, particularly at middle quantiles, emphasizing holistic development's importance. The study stresses the need for policymakers to prioritize structural transformation, export competitiveness, productivity, and human well-being for sustainable, inclusive growth in Africa.

Keywords: African Transformation Index; economic growth; Cobb-Douglas production function

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2.

Sustainable Leadership Competency Model (SLCM) For Emerging Markets and Developing Economies: Integrating Global Frameworks with Regional Realities

Umit Hacıoğlu¹

Alireza Ghezel²

Effective leadership is critical for navigating the complex sustainability challenges unique to Emerging Markets and Developing Economies (EMDEs). While global leadership models provide a foundation, they lack contextual applicability for the distinct volatilities and socio-cultural realities of EMDEs, creating a significant gap in both theory and practice. This study aimed to develop and validate a culturally attuned Sustainable Leadership Competency Model (SLCM) specifically for these contexts. The research employed a sequential mixed-methods methodology, beginning with a systematic review of global literature to extract competencies, followed by structured interviews with 13 regional experts for validation and refinement. The resulting validated model identifies five core domains: Strategic Competencies, Core Competencies, Core Values, Collaborative Competencies, and Personal Leadership Capacities comprising 16 specific competencies, including critical refinements such as Frugal Innovation, Critical Reflexivity, and Authentic Humility. This study provides policymakers, educators, and organizational leaders in EMDEs with a practical, evidence-informed framework to cultivate leaders capable of driving inclusive and resilient growth. Future research should focus on developing a quantitative instrument to test the model's predictive validity across diverse EMDE settings.

Keywords: Sustainable leadership, competency model, emerging markets, EMDEs, SDGs

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3.

Kapsayıcı Büyüme: Afrika'da Normatif Büyüme Politikaları

Lütfü Şimşek¹

Afrika'da 2000'li yıllardan itibaren şahit olduğumuz ekonomik büyüme, yapısal borçlanma ve dış finansmana bağımlılıkla birlikte gerçekleşmiştir. IMF ve Dünya Bankası öncülüğündeki istikrar politikaları ile başta parasal disiplin sağlanması amaçlanırken, kamu harcamalarının kısılması ve yapısal uyum önerileriyle büyümeyi hedeflemiştir. Geçen çeyrek asırlık dönemde söz konusu politikaların uzun vadede kapsayıcı kalkınmaya katkı sağlamadığı eşitsizlik ve yoksulluğun derinleşerek arttığı gözlemlenmiştir. Bu bildiride, Afrika'daki borçlanma süreçleri ile makroekonomik istikrar söyleminin toplumsal etkileri Gana ve Zambiya örneklerinde incelenmektedir. COVID-19 krizi kamu harcamalarının artması ve yükselen borçlar nedeniyle tekrar IMF programlarına başvurmayı gerektirdiği için özel olarak ele alınmıştır. Afrika'daki borç yükünün kamu yatırımları finansmanında kullanılmaması, kalkınmanın toplumsal tabanını zayıflatıcı bir rol oynamaktadır. Bu makalede bölgesel finansal kurumların güçlendirilmesi ve uluslararası borçluluk sözleşmeleriyle sosyal harcamalara öncelik verilmesi ve iklim finansmanı ile borç takasları gibi yöntemler sonuç bölümünde politika önerileri olarak yer almıştır.

Anahtar Kelimeler: Kapsayıcı Büyüme, Normatif Kalkınma Politikası, Yapısal Uyum, Makroekonomik İstikrar, IMF Programları

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4.

Economic Growth, Human Development and Trade: Evidence from Five High Performance Countries

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Assoc. Prof. Serap Çoban²

This study investigates the growth, human capital and trade Nexus in five high-performing African economies; Cote d'Ivoire, Libya, Rwanda and Senegal using annual datas for 1990-2023. Unit-root diagnostics (ADF/PP), ARDL bounds tests with an error-correction respresentation, and long-run estimators (DOLS/FMOLS) are combined with changepoint-aware forecasts from Prophet for 2024- 2030. Results show robust cointegration among GDP growth, human development, inflation, trade openness, financial depth and demographics. Long-run elasticities indicate that gains in human development and demographic quality are growth enhancing, persistent inflation is growth-reducing, and the finance growth link depends on intermediation quality. Error-correction speeds are sizable, implying rapid post-shock adjustment. Prophet projections reveal heterogeneous medium-term paths comparatively resilient in Rwanda and notably volatile in Libya consistent with institutional variation and commodity-price exposure. These findings align with evidence that human-capital stocks, rather than expenditure flows, underpin growth in developing economies and with guidance favouring cointegration approaches for short, structurally unstable macro series.

Keywords: Time Series, ARDL, Facebook Prophet, African Economic Growth, Human Capital

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5.

The Nexus Between Economic Growth and Income Inequality in Sub-Saharan Africa: The Role of Fiscal Policy in Achieving Inclusive Development

Abas Omar Mohamed¹

Over the past three decades, the global economy has experienced substantial growth, but this growth has been unevenly distributed across regions and populations. Sub-Saharan Africa (SSA) has seen notable economic transformation since the late 1990s, with real GDP growth averaging around 4.3% between 1995 and 2009 and continuing at about 3.3% annually into the 2010s. This growth was fueled by improvements in macroeconomic stability, structural reforms, foreign direct investment, and expanding sectors such as telecommunications and banking. However, despite these positive trends, SSA's contribution to global GDP remains small, and the growth has not translated effectively into widespread poverty reduction or income equality. Income and wealth inequality in SSA remain profoundly high. The top 10% of income earners capture approximately 54-55% of total income, while the poorest 50% receive less than 10%. Wealth is even more concentrated, with the top 10% owning around 71% of wealth compared to roughly 1% held by the bottom 90%. This entrenched inequality persists despite some marginal improvements over the past four decades, highlighting how growth benefits have been disproportionately skewed towards the wealthy or particular sectors and regions. The traditional Kuznets growth-inequality hypothesis posits an inverted U-shaped relationship between economic growth and inequality: as

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economies develop, inequality initially rises due to structural shifts but eventually declines as growth becomes more widespread. Empirical analysis in SSA, however, reveals complexities not fully aligned with Kuznets' theory. Recent studies show a U-shaped relationship where economic growth initially reduces inequality in SSA, but beyond a certain threshold, inequality begins to rise again. This indicates that many SSA economies may still be on the downward slope of the Kuznets curve or experiencing a resurgence of inequality after initial improvements. Notably, factors such as weak institutions, limited legal frameworks for inclusiveness, and governance challenges undermine the equitable progression predicted by Kuznets. In addition, the failure of neoclassical supply-side "trickle-down" theories in SSA is evident, as economic growth at the top has not adequately translated into inclusive development or reduced poverty. These models fail to account for structural inequalities, institutional weaknesses, and sectoral imbalances that limit the diffusion of growth benefits. Instead, inclusive growth theories and pro-poor development models emphasize the deliberate design of policies to ensure that economic gains reach marginalized populations directly. Fiscal policy emerges as a crucial instrument in achieving inclusive development in SSA. Targeted public investments in education, health, skills, and technology development can build human capital essential for productive employment and participation in modern economic sectors. Social welfare subsidies and well-designed social protection enhance the safety nets for the poor, reducing vulnerability and facilitating economic inclusion. A well-structured progressive taxation system is key to resource mobilization and redistribution, addressing the common issue of regressive tax burdens in many SSA countries. Redirecting tax revenues towards pro-poor expenditures can foster equitable growth and reduce inequalities. This critique and empirical evidence underscore the necessity of moving beyond trickle-down approaches toward inclusive and pro-poor growth models in Sub-Saharan Africa, fully leveraging the role of targeted fiscal interventions to bridge inequality and promote broad-based development. Hence, this study aims to empirically examine the role of economic growth in reducing inequality and poverty and explores how fiscal policy can effectively moderate the growth-distribution relationship to achieve inclusive development. Using panel data from 48 sub-Saharan African countries over the period 2000–2024, the analysis employs panel fixed effects, dynamic generalized method of moments (GMM), and quantile regression models. The primary findings reveal that economic growth in sub-Saharan Africa has been accompanied by widening income inequality and persistent poverty across models and

over time. However, the interaction between economic growth and fiscal instruments, particularly taxation and public expenditure, emerges as a significant moderating mechanism in reducing poverty. This suggests that well-designed fiscal policy, especially pro-poor demand-side measures, can serve as an effective tool for fostering inclusive growth in the region. While some heterogeneity in effects is observed due to structural differences across countries, the results remain robust under multiple specifications and sensitivity tests. These findings provide timely and actionable policy guidance for sub-Saharan African decision-makers, highlighting the need for tax base diversification, expanded pro-poor public spending, targeted social protection, countercyclical fiscal measures, strengthened fiscal transparency, deeper regional integration, increased sector-specific investment in job-creating industries such as agriculture and manufacturing, and the promotion of skills-enhancement programs linked to innovation, ensuring that economic growth translates into equitable and inclusive development.

Keywords: Economic Growth, Inequality, Fiscal Policy, Inclusive Development, Sub-Saharan Africa

6. Inclusive Growth and Normative Development Policies in Africa

Lütfü Şimşek¹

Kapsayıcı büyüme kavramı genel olarak ekonomik büyüme, ekonomik özgürlük ve fırsat eşitliği kavramlarının bir aradalığına işaret eder. İnsanın be- densel ve ruhsal iyi olma hali olarak kabul edilen esenlik uzun vadede ekono- mik büyümenin bir hedefi olarak kabul edilir. Dolayısıyla ekonomik kalkınma teknik ve nitel hedeflerinin ötesinde ekonomik çıktılar açısından değerlendiril- menin ötesinde normatif bir içerik kazanır ve toplumsal ve etik yönleriyle birlikte ele alınır. Bu makalede Afrikada sömürgecilik sonrası gelişmeler ışığında ekonomi politikalarını ele alarak, Afrikada görülen uygulama sorunlarına dikkat çekeceğiz. Uzun dönemde baktığımızda toplumsal ve siyasal maliyetler eşitsizlik ve yoksul- luğun derinleşmesi, yerel endüstrilerin ithal ürünlerin istilasını altında çözülmesi, eğitim ve sağlık hizmetlerine erişimin düşüşü ve giderek gıda ve su güvenliğinin teh- dit altında kalması gibi. Bu makalede Amarta Sen'in insan esenliğini milli gelirin üstünde bir ekonomik hedef olarak gören kapsayıcı büyüme kavramı doğrultusun- da Afrikada teknokrasi ve demokratik meşruiyet sorunu, kapsayıcılığın ölçülmesi ele alınarak sonuç ve politika önerilerine geçilecektir.

Anahtar Kelimeler: Kapsayıcı Büyüme, Normatif Kalkınma Politikası, Sürdürülebilir Kalkınma, Ekonomik Kapsayıcılık, Yetkinlikler Yaklaşımı

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7.

Assessing the Impacts of Digital Impacts of Digital Finance Services on Financial Inclusion in the Americas

Usman Ali¹

This research aims to examine the diverse effects that Digital Financial Services (DFS) exerts on promoting Financial Inclusion (FI) in the Americas. Indeed, we fill the gaps explored from the literature, such as a lack of studies for both American regions, the use of classical probit and logit models by most existing studies, and the lack of employing interaction terms. This research's primary objectives are to determine how DFS impacts FI in the region, examine which socio-economic factors significantly influence FI, and explore the interactive impacts of DFS with socio-demographic attributes on FI. This research extracted its dataset from the Global Findex database 2021, and it employs classical Probit and Logit models alongside supervised machine learning models to enhance robustness and prediction accuracy. The finding shows the statistical significance of age, female, education, employment, mobile ownership, internet access, any digital payment, and the richest income quintile coefficients of marginal effects of the probit and logit models. In contrast, the second to fourth income quintiles and the interaction term are not statistically significant. Nonetheless, there is an exception to the interactive variables, where female and digital payments have a negative coefficient in our probit model. The contributions of this study added to the established body of literature, theoretical enrichment of FI models like TAM, as confirmed by the influence of the anydigpayment attribute in enhancing FI. Novelty in methodology, where we integrated random forest (RF) and XGBoost (XGB)

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models with classical regressions, because RF and XGB provide more accurate predictions by uncovering non-linear dynamics and interactions among variables. With the help of SHAP value, we demonstrated how ML outperforms classical models by ranking the most critical features and their directional effect on FI using a bar chart and a beeswarm plot, respectively.

8.

From Aid to Autonomy: Rethinking Structural Dependency in Sustainable African Digital Development

Keita Blama¹

Abdul-Baaki Alidu²

The rapid digitalisation of governance systems across Africa has been propelled in large part by foreign aid and donor-driven initiatives. However, recent global aid cuts exacerbated by shifting geopolitical priorities, economic crises, and post-pandemic retrenchment have disrupted these efforts, revealing deep structural vulnerabilities in many African states, particularly at the local government level. This paper thus comparatively examines how the withdrawal of USAID support affects specific digitalisation projects/programmes in different African countries, with a specific focus on the USAID Ubora Mashinani program (Kenya) and Governance for Local Development (GoLD) / GoLD+(Senegal). Framed through the lenses of dependency theory and world-systems theory, the study situates the donor-recipient relationship within a broader historical and economic structure that reinforces technological dependence and peripheral positioning in the global digital economy. By analysing empirical cases in sub-Saharan Africa, the paper explores the cascading effects of aid cuts on the achievement of Sustainable Development Goals (SDGs) 11 (sustainable cities and communities) and 16 (peace, justice, and strong institutions). Ultimately, the paper argues that Africa's digital future must be reimagined through regional and locally supported strategies that reduce reliance on external actors and build resilient institutions from the ground up.

Keywords: African Digitalisation, Aid Dependency, USAID, Sustainable Development, Donor Relations

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9.

Digitalization and Economic Development in Namibia

Brigitte Fikunawa¹

Digital transformation is reshaping the global economy, with digitalization now central to policy discussions aimed at enhancing productivity and contributing to economic development. Both empirical and theoretical perspectives highlight that digitalization has negative and positive impacts on national income and employment creation. Africa Agenda 2063 and SDGs 8 & 9 place digitalization at the core of economic diversification and sustainable economic development. Therefore, developing countries like Namibia have incorporated digitalization and ICT in their National Development Plans. Despite policy interventions Namibia continues to face high income inequality, unemployment, poverty, and skill mismatches. This study examines the impact of digitalization on economic development in Namibia. The study used the Autoregressive Distributed Lag model to estimate the effects of digitalization on economic development using employment and national income as proxies of economic development. A digitalization index was formulated using the Principal Component Analysis using mobile cellular subscriptions, fixed telephone subscriptions and individuals using internet as a percentage of population. The analysis covers the period from 1990 to 2022. The findings demonstrate that digitalization has a positive and statistically significant impact on national income in the long run, however, the impact is negative in the short run. Education and institutional quality have a negative and statistically significant impact on national income. While gross fixed capital formation and gross domestic savings have a significant and positive impact on national income. In

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terms of employment, digitalization has a positive and statistically significant effect on employment creation; however, in the short run impact the impact is negative. Institutional quality is found to be detrimental to employment creation in the long run; however gross fixed capital formation has a positive and statistically significant effect on employment. In the short run education and gross fixed capital formation have a positive impact. The results highlight the need to align short-term interventions to long-term development goals. The findings support the goals for NDP 5 and 6, Agenda 63 and SDG 8&9 by highlighting the importance of digital infrastructure and investment in ICT for sustainable development. The study recommends the realignment of education system to upskill labour force with current market demand. Furthermore, it recommends reform in institutional frameworks that discourage investment and create a conducive environment for increased development.

Keywords: Digitalization, Gross National Income, Employment, SDGs

10.

Geospatial Network Analysis of Transportation Infrastructure and Mobility Experiences in Africa

Mahat Maalim Ibrahim, PhD¹

Infrastructure networks and ease of mobility constitute fundamental pillars of modern economic systems, facilitating trade flows, labor movement, and knowledge transfer that drive growth and development. The quality and extent of transportation infrastructure determine transaction costs, market access, and the ability of economies to integrate into global value chains. Contemporary economic performance requires robust connectivity, leaving regions with inadequate infrastructure at a disadvantage in attracting investment and fostering trade. Despite the African continent's vast territorial expanse, diverse political systems, vibrant young populations, and abundant natural resources, infrastructure deficits remain a persistent constraint on economic integration and development. This study examines Africa's physical infrastructure connectivity through network analysis that maps the continent's highway, railway, and air transportation networks, complemented by Afrobarometer survey data that captures citizens' experiences and perceptions of cross-border movement. The findings show that a substantial proportion of survey participants report significant obstacles in cross-border travel. Corruption, road quality, internet access restrictions, and income levels emerge as primary factors that contribute to these mobility challenges. The network analysis demonstrates considerable variation in infrastructure density and quality across different regions, with notable disparities in connectivity infrastructure.

The study concludes that meaningful regional integration requires substantial infrastructure investment and the removal of mobility barriers, which constitute fundamental prerequisites for African economic integration and sustainable development. These findings provide empirical foundations for policy interventions aimed at enhancing intra-African trade and mobility.

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11.

A Historical Analysis of Ghana's Economic System: A Post-Colonial View

Jacqueline Adjoa Lemmdi-Prikutse¹
Ayatullahi Seidu²

The economic system of Ghana has evolved significantly from its precolonial period, through colonial times to its post-colonial period. This paper, however, attempts to revisit the evolution of the economic system focusing on a structural analysis of the post-colonial phase from the first to the fourth republic. Ghana, currently, stands at the verge of implementing a twenty-four (24) economy policy, that promises to transform the economy and significantly reduce unemployment and underemployment. A structural analysis of the prevailing and previous economic systems is therefore necessary to eliminate mistakes and enhance the effectiveness and continuity of the policy. Among other findings, this paper finds Ghana to be heavy reliant on commodity export, making the economy volatile to external shocks. The economy also faces environmental issues, especially in the areas of illegal mining as well as inequality. The country has high debt issues which have created constant limitations to fiscal policy usage in the economy due to the conditionalities attached to these debts, mostly from the IMF and World Bank. Although politically challenging, an alternative approach – structural transformation, is necessary for Ghana's development. The political will to achieve this transformation, is key to resetting Ghana's economy.

Keywords: Economic History, Comparative Economic Systems, Structural Analysis, Postcolonial, Ghana

JEL: H11, N97, P41, P51

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12.

South Africa's Inclusive Growth Strategies: Performance Assessment with Socio-Economic Indicators

Hilal Alpdoğan¹

This study analyzes inclusive growth performance across the African continent, particularly comparing its policies with those of South Africa, Sub-Saharan Africa, and North Africa. The study analyzes subcomponents of the Human Development Index (HDI) and socio-economic indicators such as the Gender Development Index (GDI), as well as levels of inclusiveness in the context of governance, energy policies, social assistance, and education investments. An analysis of indicators from the post-2000 period reveals that South Africa has achieved inclusive growth performance above regional averages thanks to its depth of social policies, institutional capacity, and direct interventions aimed at reducing inequalities. In this context, the study not only highlights cross-country differences but also opens the door to the applicability of South Africa's exemplary policies to Sub-Saharan Africa. The study aims to provide a regional comparative perspective and make a unique contribution to the literature by integrating the relationship between economic growth and social inclusion within an institutional policy framework.

Keywords: Inclusive Growth, South Africa, Sub-Saharan African Countries, Economic Growth, Sustainable Development

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13.

Determinants of Microfinance Credit Demand in Ethiopia's North Wollo Zone: Implications for Rural Sustainable Development

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Million Sileshi⁴

Despite microfinance institutions (MFIs) expanding across Ethiopia, the socio-economic and institutional drivers of rural credit demand particularly the divergence between demand likelihood and credit intensity remain poorly understood, hindering progress toward Sustainable Development Goals (SDGs) 1 (No Poverty) and (Decent Work). Addressing methodological limitations in prior studies, this mixed-methods research employs the Heckman Two-Stage model to analyze data from 369 households, focus-group discussions, and key informant interviews in North Wollo, Ethiopia. The results reveal that 65.8% of sampled households demanded credit, alongside counterintuitive trends: male-headed and married households with high dependency ratios are more likely to seek credit (SDG 1), yet larger families and socially connected households borrow smaller amounts, reflecting risk aversion and reliance on informal safety nets. Education

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amplifies credit intensity (SDG 8), while perceptions of short repayment periods suppress demand. Paradoxically, off-farm work reduces credit demand but increases loan amounts, highlighting diverse livelihood strategies. These findings underscore systemic inequities, as rigid MFI products fail to align with household realities, disproportionately excluding women and low-income groups (SDG 5: Gender Equality). MFIs should adopt flexible repayment schedules, gender-sensitive lending practices, and partnerships with social organizations to bridge demand-supply gaps. By contextualizing credit systems within rural socio-economic dynamics, this work advances actionable pathways for inclusive financial policies, urging future research to address urban-rural disparities.

Keywords: Credit demand, Microfinance, Heckman Two-Stage, Ethiopia, Sustainable Development Goals (SDGs)

14.

Analyzing Wealth Inequality in Türkiye: The Effects of Monetary Policies and Financial Inclusion

Mahmud İrfan Karaca¹

This study investigates the effects of monetary policies on wealth inequality in Turkey, emphasizing the role of financial access and socio-economic disparities. Wealth inequality, characterized by the unequal distribution of assets, financial resources, and opportunities, undermines social cohesion and limits economic mobility. Recent monetary policies in Turkey, such as negative real interest rates, credit expansion, and the Currency-Protected Deposit Scheme, have disproportionately advantaged individuals with access to financial systems, allowing them to benefit from asset protection and high returns. In contrast, financially excluded individuals have faced increasing economic vulnerabilities, including rising living costs and eroding real wealth.

The research highlights how cultural and religious factors, particularly the avoidance of interest-based financial instruments, further restrict financial inclusion. Using quantitative methods, this study examines the mechanisms through which monetary policies deepen wealth inequality by favoring high-income groups and marginalizing those with limited financial access. By exploring the intersection of monetary policies, financial systems, and socio-cultural factors, the study provides valuable insights into the dynamics of wealth inequality in Turkey.

The findings stress the urgency of developing inclusive financial frameworks and equitable monetary policies to mitigate wealth disparities. Policymakers must prioritize financial literacy, access to diverse financial instruments, and culturally sensitive solutions to foster sustainable and inclusive economic growth.

Keywords: Wealth Inequality, Monetary Policies, Financial Access, Financial Inclusion, Socio-Economic Disparities

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15.

Economic and Institutional Drivers of Social Welfare Expenditure in Emerging Economies

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This research examines the economic and institutional factors influencing public social welfare spending in eight emerging countries –Bulgaria, Chile, Colombia, Hungary, Korea, Romania, Poland, and Turkey– over the period from 2010 to 2023. By employing a fixed effects panel regression model with robust standard errors, we assess how employment rates, government consumption, GDP per capita, government effectiveness, regulatory quality, and control of corruption affect levels of social spending. The findings indicate that higher employment rates and enhanced government effectiveness are significantly linked to reduced welfare expenditure, implying that better labor market conditions and administrative competence may lessen the necessity for extensive social support. Conversely, increased government consumption, elevated GDP per capita, stronger regulatory quality, and improved control of corruption show a positive relationship with social welfare expenditure, highlighting that both economic capacity and institutional integrity are vital in increasing public investment in social programs. These results emphasize the need to align macroeconomic policies with institutional reforms to maximize the scale and effectiveness of social welfare spending in emerging economies.

Keywords: Social welfare expenditure, institutional quality, emerging economies, panel data analysis

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16.

Are Proxies of Balassa-Samuelson Effect Robust? Evidence from Developing Countries

Ahsan Shafique¹
Fatima El Morabit²

Exchange rate movements have started achieving a pivotal role in shaping economic expectations of a common man in today's world. These variations which once used to be regular oscillations between currencies in the world market have gradually become the real drivers of change of the macroeconomic fundamentals in every economy. On the one hand, the daily changes in these rates impact the consumption and investment decisions of the individuals while their deviation from a perceived rather calculated normal steers action from the governments on the other, in order to control other connected macroeconomic indicators including inflation, investment, exports, imports etc. The evidence suggests that no matter how deviated these the real exchange rates between two countries may be, there exist tacit drivers that pull them back to converge to a similar pattern over time to the least. Despite evidence on convergence of real exchange rates, the studies that aim to investigate the determinants of equilibrium exchange rate find scant or at least inconclusive evidence in favour of Balassa Samuelson hypothesis (and hence purchasing power parity) as being a determinant of real exchange rate (or equilibrium real exchange rate). The study investigates using broader evidence (and not a country specific case) that the convergence of real exchange rates between different countries emanates from the law of one price. This requires first, finding a relationship between real exchange rates and Balassa Samuelson proxies

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and next between different proxies of BS and the relative sectoral productivities and in turn the price ratios of tradable to non-tradable goods. Evidence suggests that the higher relative price of non-tradables in the catching up economy leads to appreciation of its real exchange rate. Hence, this helps us establish the robust proxy(ies) for BS that reiterate the existence of BS hypothesis. Our sample includes six developing countries from different parts of the world namely, Pakistan, Türkiye, Nigeria, Malaysia, Indonesia and Thailand while the data pertaining to period 1981-2024 is used for evaluation and analysis. Evaluation uses panel data analysis techniques along with relatively new CS-DL (Cross Sectional Distributed Lag) approach. The results will help us determine the robust proxies of BS effect hence Equilibrium real exchange rate. This intern ensures precise calculation of REER misalignment, a key information for most policies pertaining to exchange rates.

Keywords: Exchange Rates, Balassa Samuelson, REER, EREER, Misalignment

17.

African Regionalism: Subregional Power Shifts and Their Impact on African Union Integration

Bukelwa Maphanga¹

This paper addresses the persistent gap between the African Union's (AU) ambitious goal of deep regional integration and its limited progress. While much scholarship attributes this stagnation to institutional weaknesses, structural constraints, and cultural heterogeneity, often in comparison with the European Union, this study identifies a neglected dimension: the impact of subregional power shifts on continental integration. Using a neorealist framework, particularly Waltz's balance of power [1] and Mearsheimer's offensive realism [2], it argues that instability within the AU's eight Regional Economic Communities (RECs) undermines cohesion at the continental level. The analysis draws on updated 2024 GDP per capita and military expenditure data from the World Bank [5] and SIPRI [4], alongside alliance patterns within four politically and economically significant RECs: the Arab Maghreb Union, East African Community, Southern African Development Community, and Economic Community of West African States. Findings show that recurring rivalries such as those between Algeria and Morocco, Kenya, Rwanda and the DRC, South Africa, Zimbabwe and Angola, and Nigeria, Ghana and Côte d'Ivoire generate multipolar instability at the subregional level, which then spills over into AU decision-making. Without stronger subregional integration and a widely accepted regional hegemon, the AU's supranational ambitions will remain aspirational. This paper reframes the integration debate by foregrounding power politics as a decisive but underexplored factor.

Keywords: Regionalism, Regional Order, Neorealism, African Union, Balance of Power

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18.

Democratization, Inequality, and Internal Security in Nigeria: Evidence from Longitudinal Survey

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Idi Adamu²

Jamila Ali³

A more democratic political system is anticipated to pave ways for greater just and fair society with little or no internal violent tendencies and criminal vices. Some scholars have demonstrated that there may be a complex relationship between state's transition to a more democratic political environment and equitable distribution of resources as well as maintaining peaceful and violent free society that can guarantee meaningful and sustainable economic development. Nevertheless, it is widely believed that democracies empower citizens to participate in decision-making through formulation of policies that address inequality, social justice, and conducive environment devoid of internal conflicts that enhance economic prosperity.

The search for social justice, fairness and equitable distribution of resources, violent free society, and overall economic growth and development under the democratic dispensation in Nigeria, can only be realized by ensuring existence and adherence to democratic principles. There are concerns that deviation from or failure to adhere to rudiments of democratic governance can lead to a wide income and wealth disparities in an economy, which in turn may lead to disruptions

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of laws and orders by increasing the rate of criminal activities and chaos. Against this backdrop, the study intends to examine how some of the fundamentals of democratic governance in Nigeria influence socioeconomic outcomes. Specifically, the study will be underpinned to:

- Examine the effect of the conduct of electoral process on socioeconomic outcomes in Nigeria.

- Ascertain how the extent of democracy affects socioeconomic outcomes in Nigeria.

- Determine the effect of government effort towards curbing inequality on internal security in the country.

The paper will use longitudinal data from Afro barometer dataset consisting of 8 waves (wave 2 to wave 9). The overall dataset consists of over 17,000 respondents drawn across the 6 geopolitical zones of the country and a cluster sampling strategy was used in collecting the data. Conversely, the paper will adopt appropriate discrete choice logistic models to achieve its preoccupation.

Findings from the study will form part of crucial policy documents for measuring the performance of democratic governance in Nigeria towards realization of yearnings and aspirations of Nigerian electorates in general as well as measure government efforts towards attainment of Sustainable Development Goals (SDGs) in the country with particular emphasis on reducing inequality in Nigeria; provide a reference document to think-tanks among researchers and institutions of learning in the country at large; and contribute to the body of knowledge by providing a paradigm shift in debate and public discussion on democratization and socioeconomic outcomes in the country.

Keywords: Democratization, Inequality, Internal Security, Sustainable Development Goals

19.

Caught in the Crossfire: Livelihood, Employment and Forced Displacement in Nigeria

Jamilu Said Babangida¹

Parvinder Kler²

Anita Staneva³

Forced displacement due to Boko Haram conflict poses a significant shock to livelihood opportunities with far reaching implications of claiming lives and properties in Nigeria. Considering gender differences, we assess the outcomes for individuals displaced by Boko Haram conflict in terms of livelihood opportunities and labour market. We use the World Bank data on the profile of Internally Displaced Persons (IDPs) in North-East Nigeria 2018. Our logistic and Probability score matching (PSM) results suggest that female who are forcibly displaced are more likely to be self-employed in non-farm activities. Our result indicates different patterns for both males and females. We reveal a trend for male farm employment, where forced displacement exerts negative impact, resulting in substantial reduction in the likelihood of self-employment in farm activities. Despite the cost of displacement on livelihood opportunities, we find no discernible impact on labour force participation for both IDPs and hosts. The overall costs of forced displacement are modest. Therefore, we conclude that forced displacement has discernible impact on livelihood opportunities for male than female with no impact on labour force participation for IDPs. Our finding underscores the critical role of informality as a buffer against forced displacement shocks in conflict-affected regions.

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20.

The Education Spending Paradox: Cross-Sectional Evidence and Dynamic Analysis for Mena and African Economies

Hüseyin Utku Demir¹

This study investigates the complex relationship between education spending and economic productivity across 164 countries from 1988 to 2023, with a detailed focus on 38 Mena and Sub-Saharan African economies. Using a novel productivity measure (*verim*) that captures a country's relative economic efficiency, we first establish a stylized fact: a consistent, negative correlation between education spending as a percentage of government expenditure and short-term productivity. To unpack this finding, we employ Autoregressive Distributed Lag (ARDL) and Nonlinear ARDL (NARDL) methodologies. The dynamic analysis reveals that while short-term productivity trade-offs are common, the long-run effects are highly heterogeneous and often asymmetric. Many Mena and African countries show positive long-run productivity gains from increased education spending, but the response to spending increases often differs significantly from the response to cuts. Our findings suggest that policymakers must manage immediate productivity costs while fostering long-term human capital growth, emphasizing the need for stable, context-specific education investment strategies.

Keywords: Education Spending, Economic Productivity, ARDL, NARDL, Human Capital, Mena and African Economies

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21.

Job Polarization in the Turkish Labor Market: Routine-Biased Technological Change (RBTC)

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The global acceleration of technological innovation, particularly in artificial intelligence and machine learning, presents a paradigm shift for labor markets worldwide. While enhancing productivity, these advancements simultaneously challenge the demand for human labor across various occupations, often displacing roles characterized by routine tasks. This study investigates the impact of routine-biased technological change (RBTC) on employment structures in Türkiye, a developing yet technologically dynamic economy.

Extending the seminal work of Autor et al. (2003) and the empirical models of Goos et al. (2014) beyond developed economies, we analyze whether technological adoption has driven job polarization –the simultaneous growth of high- and low-skilled jobs at the expense of middle-skilled occupations– in Türkiye. Utilizing microdata from the Turkish Statistical Institute (TURKSTAT) Household Labor Force Survey and complementary secondary data from the Central Bank of the Republic of Türkiye from 2009 to 2022, we construct a longitudinal dataset for the prime-age labor force (15-60 years). Our modified linear model regresses labor demand (measured by working hours) on key variables, including average occupational wages, a Routine Task Intensity (RTI) index, and industrial controls for marginal cost and production.

The findings confirm that job polarization is an evident phenomenon in the Turkish labor market. Mirroring patterns observed in developed nations and other major emerging economies like China (Chen et al., 2021) and Mexico (Medina &

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Posso, 2010), employment growth has been strongest in high-skill cognitive and low-skill manual service occupations, while medium-skill routine-intensive jobs have declined. However, our results also align with evidence from Daş (2021), suggesting that the polarization trend in Türkiye may not yet be as pronounced as in advanced economies, potentially due to differences in the pace of technological diffusion and industrial composition.

This research provides critical empirical evidence that developing countries integrated into global high-tech value chains are not immune to RBTC-driven polarization. For policymakers in Türkiye and the broader Global South, these findings underscore the urgent need to design forward-looking education, vocational training, and social protection policies that mitigate the risks of polarization and harness technology for inclusive growth.

Keywords: Job Polarization, Routine-Biased Technological Change (RBTC), Technological Adoption, Labor Market, Türkiye, Developing Economies

22.

Enhancing Lake Victoria's Sardine Value Chain in Tanzania: A Collaborative and Inclusive Business Model

Josephine Joseph Mkunda¹

Tanzania's Lake Victoria sardine (dagaa) industry, contributing 71.2% of fish landings and US\$227.7 million annually, supports over 800,000 livelihoods but is hindered by inefficiencies, income inequality (Gini 0.61), and 53.6% post-harvest losses. This study proposes an inclusive business model to enhance marketing, value addition, and equitable benefit distribution. Employing a mixed-methods approach in Mwanza, Mara, and Kagera, guided by stakeholder theory and the Structure-Conduct-Performance framework, data from 546 respondents, 18 interviews, 12 focus groups, and 12 landing site observations highlight trader dominance (60.2%), poor market access, and consumer preferences for fresh (78%) and sun-dried sardines (65%). The model integrates cooperatives, solar dryers, market linkage platforms, gender-inclusive training, and institutional partnerships, projecting a 40% reduction in losses and a 20% decrease in inequality. Key recommendations include cooperative formation, adoption of modern processing technologies, and policy support for subsidies and legislation, aligning with SDGs 1, 5, 8, and 17. This stakeholder-driven approach addresses market inefficiencies and promotes sustainable development in Tanzania's sardine value chain, offering a scalable model for regional fisheries.

Keywords: Inclusive Business Model, Lake Victoria, Sardine Value Chain, Stakeholder Collaboration, Market Inefficiencies

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23.

Capital Budgeting and Construction Economics under Uncertainty

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Capital budgeting in construction projects is a complex decision due to several factors affecting economic decisions and uncertainty. In this paper, an advanced performance-driven capital budgeting optimization model for construction economics is utilized, considering cost, value, and risks in the construction industry using fuzzy linguistic terms. A novel model is presented, and an illustrative construction case is given. Finally, a decision-making support and business analytics system for managing capital budgeting problems is provided. The results can be further used in multi-project construction projects where construction managers need an efficient integrated system to handle performance measurement and capital budgeting issues. The proposed approach yields the optimal results.

Keywords: Economics, Uncertainty, Fuzzy logic, construction projects, Business analytics, capital budgeting

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24.

The Interdependence and Cointegration of Stock Markets: Evidence from Japan, India and the USA

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In a rapidly globalizing world, understanding the relationships between major stock markets is of paramount importance for investors and economists. This study explores the interdependence and cointegration of stock markets in Japan, India, and the USA, and explores the dynamics of global financial markets as well as the survival of a long-term and short-term link between these three indices. These leading stock markets were selected because of the researchers' desire to learn more about the connections between them. From April 2012 through March 2024, we used monthly data from three major stock market indices: the NIKKEI (Japan), the BSE SENSEX (India), and the NASDAQ (USA). Stock market performance in both the United States and India tend to move together. Additionally, the GC test is utilized in an effort to ascertain if the markets have any form of forecasting ability. Based on the results of the tests conducted, it was determined that the NASDAQ index can accurately predict the SENSEX index, but the NIKKEI index. The United States and the Indian stock markets are highly correlated. To further investigate the markets' potential for foresight, the Granger causality test is applied. Tests showed that while the NASDAQ index predicted the SENSEX index with high precision, the NIKKEI index did not.

Keywords: Granger Causality, Stock Price Indices, Stock Exchange, Cointegration, Vector Autoregression

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25.

Analyzing the Impact of Fiscal Austerity Policy on Urban Resilience in Türkiye

Zoha Memon¹

Urban resilience is defined as the ability of urban economies to absorb, respond to, and recover from external and internal shocks, including economic crises, policy changes, natural disasters, and socio-political disruptions. During financial crises, governments often attempt to stabilize the economy through fiscal austerity policies, which is one of the most comprehensive policy responses, including methods such as the government increasing taxes or reducing public spending. However, the socioeconomic impact of such policies in developing nations remains unexplored. Therefore, the objective of this research is to empirically analyze Türkiye's fiscal austerity and its potential implications for regional urban resilience. While most literature predominantly explores the macro-level impacts of fiscal policies, this research conducts cross-regional comparative research using data on urban resilience and fiscal austerity in all 81 provinces of Türkiye between 2008 and 2024. With Principal Component Analysis (PCA), the urban resilience index is developed using 14 comprehensive indicators across three dimensions: economic, social, and infrastructural, allowing the analysis to provide a more nuanced interpretation of the relationship between urban adaptability and fiscal pressures. Moreover, an advanced mapping technique was employed through the R program to visualize and interpret spatial disparities in urban resilience. Panel VAR analysis is another important component of this analysis, as

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it intends to capture dynamic policy effects over time, while fixed effects estimation captures the relationship between fiscal austerity and urban resilience. The study reveals that fiscal austerity limits local growth by lowering investments in public development projects. This threatens regional urban resilience, undermining the impacts on weaker economies and exacerbating spatial inequalities. The study suggests that policymakers should develop inclusive fiscal strategies to promote equitable urban development. It provides real-world policy considerations and implications for fiscal austerity as part of sustainable urban economies.

Keywords: Fiscal Austerity, Türkiye's Fiscal Policy, Urban Resilience.

26.

Forecasting NAV of Selected Large Cap and Mid-Cap Mutual Fund Schemes Using Arima

Mukund Sharma¹

Bhavya Vikas²

Wealth, place & power are no measure of sources. The only true measure is the ratio between what we might have been & what we have become”. In this regard people should upgrade their knowledge & keep in pace with changing technology & market condition to reach their desired goal. As new opportunities are opening up in every field all over the world. The desired goal can achieve only when both theory and practical go together hand in hand. This article is such an attempt to understand or link the theoretical concept with that of practical applicability. It provides an in-depth analysis of Mutual Funds Schemes, encompassing their benefits, various facts crucial to understand and associated risks. Furthermore, the theoretical background of mutual funds, including the types of funds available, their advantages, and potential risks have been dealt with.

The study majorly focuses on evaluating the performance of specific mutual fund schemes in the large-cap and mid-cap categories. By analyzing various portfolio evaluation models, including Sharpe, Treynor, and Jensen’s alpha, as well as other metrics such as Standard Deviation, Beta, and Portfolio Return, the research aims to identify top-performing funds. The study utilizes correlation analysis and the ARIMA model to forecast the Net Asset Value (NAV) of the highest-ranked funds, providing insights into risk and return profiles, and assisting

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advisors in recommending suitable investment choices to investors. The study concludes by emphasizing the importance of professional management and diversification in investment, particularly within the dynamic and unpredictable stock market environment.

Keywords: Risk, Return, Beta, Standard Deviation (SD), Net Asset Value (NAV) & Assets under Management (AUM), Autoregressive Integrated Moving Average (ARIMA)

27.

Microfinance Credit and Household Food Security in North Wollo, Ethiopia: An Endogenous Switching Regression Analysis

Malefiya Ebabu¹

Zemen Ayalew²

Kedir Jamal³

Million Sileshi⁴

Microfinance institutions (MFIs) are championed as tools to combat rural poverty and food insecurity, yet their effectiveness remains debated, especially in vulnerable regions like Ethiopia's North Wollo Zone. This study analyzes 369 households using an Endogenous Switching Regression model to assess microfinance's causal impact on food security while correcting for selection bias. Results demonstrate significant benefits: participants consumed 17% more calories (2,496 vs. 2,129 kcal/AE/day) and achieved greater dietary diversity (6.29 vs. 5.72 food groups). Treatment effects show a 1.09-point improvement in Food Consumption Scores for participants ($p < 0.01$), though potential gains for non-participants (0.41 points) were statistically insignificant. However, access barriers persist, with male-headed households 15.5% more likely to obtain credit ($p < 0.05$), revealing gender disparities. Restrictive loan terms (high interest rates, rigid repayment) further limit participation. The findings underscore microfinance's dual role in immediate hunger relief and long-term resilience building through agricultural

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investments and income diversification. To maximize impact, MFIs should adopt gender-sensitive policies and flexible repayment schedules synchronized with harvest cycles. These adjustments would better align microfinance with SDGs 2 (Zero Hunger) and 5 (Gender Equality), transforming it into an effective tool for equitable food security in drought-prone regions. Future research should examine long-term effects and urban-rural differences to optimize targeting strategies.

Keywords: Microfinance, Food Security, Endogenous Switching Regression, Ethiopia, SDGs

28.

Semiparametric Bayesian Analysis of the Spatial Disparities and Determinants of Severe Food Insecurity in Africa

Mesfin M. Ayalew¹

This study investigates the environmental, socio-economic, and spatial determinants across the African continent from 2015 to 2021 using a Geo-Additive Mixed Model (GAMM) within a semiparametric Bayesian framework. The dataset for this study was sourced from FAO, WHO, the World Bank and the Ethiopian Statistical Service (ESS). The analysis simultaneously estimates the effects of fixed and nonlinear covariates and spatial effects in a unified regression framework. Inference was carried out using the Integrated Nested Laplace Approximation (INLA) algorithm with Gaussian Markov Random Fields (GMRF). Results from linear fixed effect covariates revealed that electricity access, malaria incidence, climate change, and livestock production significantly influence severe food insecurity with 95% credible intervals. The nonlinear effects of cereal import dependence, dietary energy supply, GHG emissions, GDP, unemployment, inflation, caloric loss, and dietary protein supply were also statistically significant. From a spatial perspective, substantial disparities in severe food insecurity were observed across African countries. Central and parts of Eastern Africa including South Sudan, Somalia, the Central African Republic, the Democratic Republic of Congo, the Republic of Congo, Malawi, Chad, Cameroon, Guinea, Zambia, Zimbabwe, Rwanda, and Liberia experience severe food insecurity due to localized shocks, short-term events, or country-specific policies. In contrast, the northwestern and southwestern regions of the continent experience severe food insecurity

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due to long-standing structural factors rather than temporary shocks. Therefore, this study recommends that policymakers prioritize spatial considerations in developing strategies to combat severe food insecurity, thereby enhancing the targeting of interventions and resources to vulnerable areas.

Keywords: Severe Food Insecurity, Geo-Additive Mixed Model, Spatial Disparities, R-INLA, Africa

29.

Effects of Biomass Energy Extraction and Agricultural Land Use on Land Use Emission in Nigeria

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Hussein Mohammed Andani²

The harnessing of biomass energy resources and agricultural land expansion have consequences on land use emission. Both agricultural expansion and biomass energy production continue to drive land use change due to their direct connection to forestry. High demand for biomass to produce biofuel might cause agricultural expansion, leading to biodiversity reduction, degradation of soil quality and higher land use emission. On this background, the research examines the effects of biomass energy extraction and agricultural land use on land use emissions in Nigeria. The study compiles data from FAO and WDI and covers the 1990-2022 period. We employ fully modified ordinary least square (FMOLS) model with land use emissions as the dependent variable. Meanwhile, the explanatory variables include biomass energy extraction, hectares of agricultural land, and hectares of forest land. The findings establish that agricultural land use significantly amplify land use emission, while biomass energy extraction depress emissions from land use. However, the undesirable effect of agricultural land use dominates the mitigating effect of biomass energy extraction. Besides, forest land use has no significant effect on land use emissions. The results have implications for the Nigeria's drive towards sustainability. First, unsustainable agricultural practices hinder environmental sustainability, which leads to increased land use emissions due to agricultural land expansion. Second, extraction of biomass resources does not

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put much pressure on sustainability due to biomass carbon neutral status. Sustainable biomass energy production will facilitate emission mitigation and enhance sustainable environment. Therefore, the research recommends investments in sustainable agricultural production through public private partnership to align agricultural practices with sustainable land use.

Keywords: Biomass energy extraction, Agricultural land use, Land use emission, Sustainability.

30.

Time-Varying Connectedness between Precious and Rare Earth Metals

Hassan Zada¹

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After the COVID-19 pandemic, spectacular challenges appeared in global financial markets, prompting renewed attention to finding valuable investment opportunities to improve portfolio management. The current study examines the dynamic interconnectedness between rare earth and precious metals and emphasizes their implications for optimal portfolio management. By considering the TVP-VAR model, this study depicts the dynamic nature of volatility and return spillovers between these categories of metals. The study considers four precious metals, namely, Gold, Silver, Platinum, and Palladium, and eight rare earth metals: Battery-Grade Misch metal, Cerium, Dysprosium, Lanthanum, Neodymium, Praseodymium, Terbium, and Yttrium. The sample period is from November 1, 2010, to October 31, 2024. Further, the sample is divided into two sub-samples to examine the connectedness between precious and rare earth metals: pre-COVID-19 and during COVID-19. The results show potential time-varying connectedness in times of economic uncertainty, implying that both types of metals respond to market-specific factors and macroeconomic shocks. From the investment perspective, this study highlights the diversification and hedging potentials of considered metals with the implications of various asset allocation strategies. The study also contributes by offering nuanced insights into the behaviors of emerging assets within the dynamic investment framework.

Keywords: Interconnectedness, Rare Earth Metals, Precious Metals, TVP-VAR, Portfolio Management

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31.

Evaluating the Consequences of Climate-Driven Migration on Food Security in Africa: An Exploratory Analysis of Interconnected Vulnerabilities in Ghana

Akilu Murtala¹

Scientific and environmental evidence giving credence to the occurrence of climate change abound. It is also on record that African countries are the least contributors to the occurrence of the phenomenon. Regrettably however, it is a trite knowledge that the continent of Africa suffers the brunt of the erratic changes in the climate the most when juxtaposed with industrial nations in other continents. With majority of the workforce in Africa engaged in agricultural activities, environmental degradations occasioned by these erratic climatic changes tend to cause a lot of havoc, rendering many individuals displaced and/or unemployed. The situation compels a significant number of people to migrate to other countries in search of alternative source of livelihood. Such a trend is the food insecurity situation in many African countries. This paper is mainly a literature review of existing works on the subject. The results indicated that, while no direct link has been established with respect to the relationship between climate change and migration, there are ample evidence to the effect that farmers who primarily depend on rainfall do migrate during dry seasons, or when low rainfall is forecasted in a rainy season.

Keywords: Climate Change, Climate Migration, Food Security

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32.

Cultural Differences, Adaptation, and Dynamics: Perspective from Black African Male Immigrants in Interracial Marriage in Türkiye

Zulkarnain Mohammed Laye¹

This study examined the role of cultural differences in interracial marriages. A qualitative approach employing in-depth interviews with 20 individuals in marriages involving black male African immigrants and ‘white’ female Turks was utilized to examine how the couples perceive culture differences as a variable in their marriages, its impact on the formation of their relationships, how it shapes and continues to shape their union, including the challenges it presents, and how they navigate these challenges. Almost all the respondents appreciated cultural differences as a likely route of conflict in their unions. In the same breath, they tailored the strength of their union to these differences. In this regard, cultural differences provided spices to nourish their union, preventing the union from going dormant with rudimentary claws. There is always something new to learn, which instills an element of adventure into the union. While improved and constant communication was key in resolving conflicts generally, downplaying differences and holding on to a common identity in religion were significant for many. These findings further existing literature by shifting the focus away from the overly focused hostile terrain of conflicts associated with cultural differences.

Keyword: African Immigrants; Communication; Cultural Differences; Interracial Marriages

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33.

From Wealth to Welfare: Assessing Digital Assets as *Māl* in Islamic Law

Mohamed Jalloh¹

This study reinterprets the classical Islamic concept of *māl* (property) for the digital age, using emerging digital assets –particularly cryptocurrencies– as a case through which to test Islamic legal adaptability. It reexamines the juristic definitions of *māl* in the Ḥanafī, Mālikī, *Shāfi‘ī*, and Ḥanbalī traditions, developing a principle-based evaluative model built on ‘urf (societal recognition), *Shari‘ah* compliance, utility, and necessity. Through textual analysis of primary *fiqh* sources, the study finds broad agreement that ‘urf and permissibility remain the primary determinants of what qualifies as *māl*, while traits such as utility and transferability are secondary. Applied to cryptocurrencies, these principles yield a nuanced conclusion: although ethically neutral and functionally useful, cryptocurrencies qualify as *māl* within their own digital ecosystem, where they are recognized and transacted, but do not yet meet the level of predominant acceptance required in Islamic jurisprudence for universal recognition. The maximal-*ḥukm li’l-ghālib* – that legal judgment follows what is predominant– implies that widespread recognition must exist before Islamic law recognizes digital currencies *asmālin* the full *Shari‘ah* sense.

In Africa, used here as a representative case of digitally underserved but economically dynamic regions, limited connectivity (38 percent internet access) and heavy informal employment (about 90 percent) restrict participation in digital economies. Nevertheless, studies show that religiosity continues to drive civic engagement and entrepreneurship among Muslim youth, offering a foundation for

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Shari‘ah-aligned digital inclusion. Historical juristic precedents, such as the later acceptance of human blood as *māl* under necessity, demonstrate the *Shari‘ah*’s capacity to evolve in response to technological change. Grounding digital-asset participation in the *maqāṣid al-Shari‘ah* –particularly *ḥifẓ al-māl* (the protection and preservation of wealth)– this research presents a principled ethical framework through which Muslim youth can pursue innovation with integrity while fostering inclusive and just economic growth that benefits society as a whole in the digital era.

Keywords: Māl; Islamic Jurisprudence (Fiqh), Shari‘ah Compliance, Cryptocurrency; digital assets, ‘Urf (Custom), Africa, Ethical Innovation

34.

Linkage Between Higher Education Development and Environmental Degradation: An Empirical Evidence from Pakistan

Rabia Khalid¹

Dr. Noman Arshed²

Concerns related to environmental sustainability are increasing, particularly in the case of developing countries where redundant human capital poses a severe threat to the environment. Present study examines the role of higher education towards environmental sustainability in the case of Pakistan. The association between higher education development and CO₂ emission is examined through the ARDL model from 1965 to 2020. Apart from ARDL the non-linearity among variables have been tested through QARDL model. The number of students enrolled in higher education institutes has been used as a proxy for higher education development. The bounds test findings confirmed the cointegration among variables, whereas the Error Correction Term (ECM) coefficient indicates that the series converges toward its long-run path with a speed of 49 percent per year. Findings concluded that development in higher education act as a catalyst in reducing environmental degradation, raising awareness among individuals to change their consumption patterns from non-renewable to renewable energy sources. Furthermore, results of Quantile regression confirmed that the U-shaped environmental Kuznets Curve exists in the case of Pakistan. This study suggests that expanding higher education can be a powerful instrument for finding an innovative solution to overcome environmental challenges.

Keywords: Higher education, Carbon Dioxide Emission, Economic Growth, Johansen Cointegration

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35.

Inclusive AI in Diverse Linguistic Contexts: A Phenomenological Exploration of User Experiences with ChatGPT

Merve Armagan Bogatekin¹

Purpose: This study investigates how using a first or second language influences user perceptions of ChatGPT. It aims to better understand how multilingual contexts shape AI-human interactions. **Design/methodology/approach:** After participants interacted with ChatGPT in both their native language (Turkish) and second language (English), semi-structured interviews were conducted. We conducted a phenomenological analysis that examined emotional engagement, human likeness, cultural fluency, and perceived intelligence in both languages. **Findings:** Participants with lower English proficiency attributed more human-like qualities to ChatGPT in their native language, Turkish. They also reported stronger emotional engagement in their native language. However, most participants perceived English interactions as more efficient and intelligent, and concerns arose over ChatGPT's cultural fluency. **Research limitations/implications:** Balancing emotional connection with linguistic and cultural accuracy is tricky for non-native speakers of English. These results show the importance of language and cultural context in shaping perceptions of AI. The study was conducted with 33 participants, and the findings are not generalizable to the whole population. **Practical implications:** The study offers valuable insights that help researchers and professionals achieve a broader understanding of AI-human interaction across languages. Therefore, AI systems must improve linguistic proficiency and cultural fluency to be more inclusive and humanlike. **Originality/value:** This study explores the experiences of non-native English speakers with AI.

Keywords: Media Equation Theory, Phenomenological Analysis, ChatGPT, Bilingualism, Inclusivity, AI.

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36.

Structural Transformation and Youth Employment Crisis: Evidence from Ethiopia's Economic Development (1999-2023)

Nuha al-Ziyadi¹

Mohammed Muntaka Abdul Rahman²

This study investigates the impact of structural transformation on youth employment in Ethiopia between 1999 and 2023. Using World Bank data, the analysis applies econometric approaches, including GMM and ARDL models, to examine the effects of sectoral employment shares, foreign direct investment, GDP per capita, urbanization, and a structural transformation index on youth employment outcomes. The findings reveal that industrial employment and overall economic growth contribute positively to youth job opportunities, while agricultural dependence, urbanization, and structural transformation pressures are associated with adverse effects. The service sector exhibits mixed results, with limited capacity to absorb youth labor despite its expansion. Further interaction analysis shows that foreign direct investment supports industrial employment but has negligible or negative effects in agriculture and services. Overall, the results highlight a disconnect between economic growth, investment inflows, and the ability of the labor market to absorb young workers. The study underscores the need for employment-centered development strategies, with a particular emphasis on labor-intensive industrialization and policies that better link investment to youth employment creation.

Keywords: Structural Transformation, Youth Employment, Sectoral Employment Shares, Foreign Direct Investment, Economic Development

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37.

Rethinking Phosphate Infrastructure in Morocco: Technopolitics, Extractivism, and Islamic Environmental Ethics

Safa Fadil¹

Following the 2020 global crisis, food security became a crucial focus, elevating Morocco's phosphate industry to a new level of global significance. Phosphate production is not only linked to fertilizers but also influences green energy transitions and economic growth. Since its discovery, phosphate extraction has been viewed only as a technical objective economic resource for exploitation. However, scholarship reveals its subjective ideological nature, especially within the post-colonial context of Morocco, where large-scale projects often serve the interests of colonial powers and capitalism. This research examines Morocco's phosphate industry not only as a system of material extraction and distribution, but as an epistemological regime that shapes which forms of knowledge and ethics are deemed legitimate. Drawing critiques from technopolitics, extractivism, and epistemic violence, the study explores how phosphate infrastructure and extraction establish certain knowledge and worldviews and erase other alternatives. In response, it proposes Islamic environmental ethics, grounded in concepts like *khilāfa*, *mīzān*, and *'adl*, as an alternative framework for rethinking the phosphate infrastructure. By reintroducing Islamic ethical thought into the academic realm, the project promotes a decolonial approach. It criticizes Morocco's extractivist model by reviving neglected Islamic knowledge and highlighting its importance for sustainable governance. This approach adds to broader conversations on environmental justice, development ethics, and the re-politicization of infrastructure in the Global South.

Keywords: Morocco, Phosphate Industry, Technopolitics, Extractivism, Postcolonialism, Islamic Environmental Ethics, Epistemic Justice

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38.

Pushed To the Edge: A Closer Look at The Factors Associated with An Increase in the Propensity to Emigrate from the MENA Region

Abdulrahman Alkoli¹

This paper examines the determinants shaping both the propensity to emigrate and the willingness to emigrate illegally across 11 MENA countries, using data from the 5th (2018-2019) and 7th (2021-2022) waves of the Arab Barometer survey. Employing a two-step probit model, the study finds that younger age, male gender, unemployment, insufficient household income, and higher educational attainment significantly increase the likelihood of emigration intentions, while religiosity reduces them in several contexts. Social media use and perceptions of deteriorating economic, political, safety, and freedom conditions further heighten the propensity to emigrate, with safety concerns being particularly influential in shaping willingness to consider illegal migration. Education, however, demonstrates a dual effect: while it raises the propensity to emigrate, it simultaneously lowers the likelihood of illegal migration. The findings highlight the complex interplay between sociodemographic, economic, political, and cultural factors in migration decisions. Policy recommendations emphasize fostering public-private-university partnerships to create employment pathways, strengthening local labor markets, and dismantling illegal migration networks. By quantifying multi-dimensional determinants, this study contributes to migration literature and provides actionable insights for policymakers seeking to mitigate brain drain in the MENA region.

Keywords: Propensity to Emigrate, MENA Region, Willingness to Emigrate Illegally.

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39.

Advancing Artificial Intelligence in Africa: Bridging Infrastructure, Policy and Skills Gaps

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In conclusion, Artificial Intelligence offers tremendous potential to drive sustainable development, economic growth, and social progress across Africa, but realizing this promise will depend on overcoming a range of complex, interrelated challenges. The continent’s journey toward meaningful AI adoption is hampered by inadequate digital infrastructure, unreliable electricity, limited broadband access, fragmented and poor-quality data, and a lack of comprehensive data governance frameworks that safeguard privacy, security, and ethics. These technical barriers are compounded by a significant talent shortage, high costs of AI technologies, and the absence of robust policy and regulatory environments that can provide clarity and confidence for investors, innovators, and the public. Without deliberate efforts to ensure inclusivity, there is also the risk that AI could exacerbate existing socioeconomic inequalities and widen the digital divide between urban and rural areas or rich and poor populations. Moreover, public skepticism and low trust in AI, driven by misinformation and fears of job displacement, present further hurdles to its acceptance and integration. Yet, amid these challenges, encouraging signs of progress are emerging. Local initiatives and regional efforts are

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laying the groundwork for AI capacity-building, policy development, and practical applications tailored to Africa's unique needs, from agriculture and health-care to financial inclusion. To truly unlock AI's transformative potential, coordinated action will be essential-combining investments in infrastructure, education, and research with the creation of inclusive regulatory frameworks and support for homegrown innovation. Only through such holistic and collaborative approaches can Africa harness AI as a force for equitable growth and sustainable development.

Keywords: AI, Challenges, Africa, Large Language Models, Efficiency

40.

The Impact of Informal Competition on Registered Firms in Rwanda: A Machine Learning Approach

Can Verberi¹

This paper investigates the effect of informal competition on the productivity of registered firms in Rwanda, utilizing data from the 2023 World Bank Enterprise Survey. The analysis combines traditional econometric methods with interpretable machine learning techniques to capture non-linear and distributional heterogeneity in firm performance. OLS and quantile regression estimates indicate that informal competition has a significant negative effect on productivity, with stronger impacts observed among higher-productivity firms. Firm age, quality certification, firm size, licensing, foreign ownership, and innovation are found to enhance productivity, whereas managerial experience exhibits a negative effect. Machine learning models, including LightGBM, XGBoost, CatBoost and Random Forest, exhibit limited predictive power. The findings suggest that addressing informal-formal cost differentials, improving enforcement, and promoting innovation-driven formalization are essential for mitigating the adverse effects of informality.

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41.

Empowering Africa Through Artificial Intelligence and Digital Technologies for Sustainable Growth

Karishma Sharma¹

The use of Artificial Intelligence (AI) and digital technologies has been transforming the economy, social and industrial sphere of Africa by promoting innovations and sustainable development. The paper examines the implementation of AI powered solutions, digitization technologies and other emerging technologies in areas or sectors like agriculture, healthcare, education and finance. The study utilized both qualitative and quantitative research methods; the secondary data statistical research method was combined with the secondary data case study method and case studies that were conducted in major economies of Africa. It is shown that the adoption of AI can boost productivity, financial inclusion, and digital entrepreneurship and thus play a pivotal role in the attainment of Sustainable Development Goals (SDGs). Nevertheless, the lack of infrastructure, digital skills and governance in terms of data are still significant challenges. The paper establishes an elaborate framework with an emphasis on policy changes, capacity-building, and investment in technology ecosystem. Findings highlight that a crafted employment of AI and digital technologies could fast-track the shift toward an innovation-driven and inclusive economy in Africa.

Keywords: Artificial Intelligence, Digital Technologies, Sustainable Growth, Innovation, Africa

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42.

Afrika Ülkelerinde Yeşil Büyüme ve AI Göstergesinin Etkisi: FMOLS ve Wavelet Analizi Yaklaşımı (1996-2024)

Emin Ahmet Kaplan¹

Bu çalışma, 1996-2024 döneminde dokuz Afrika ülkesinde (Mısır, Güney Afrika, Nijerya, Gana, Kamerun, Kenya, Senegal, Mauritius ve Uganda) yeşil büyüme ile AI göstergesi arasındaki ilişkiyi incelemektedir. AI göstergesi olarak, ülkelerin AI alanındaki bilimsel yayın sayıları kullanılmıştır. Modelde, yeşil büyüme bağımlı değişken olarak alınırken, reel GSYH, yenilenebilir enerji tüketimi, doğal kaynak gelirleri ve hükümet etkinliği kontrol değişkenleri olarak dahil edilmiştir. Tüm değişkenlerin logaritmaları alınarak FMOLS yöntemiyle panel eşbütünlük analizi gerçekleştirilmiştir. Ayrıca, dalgacık (*wavelet*) spektrumu ve dalgacık eş-kohorens analizi ile değişkenler arasındaki zaman-frekans ilişkileri incelenmiştir. Bulgular, AI göstergesinin yeşil büyüme üzerinde pozitif ve anlamlı etkisi olduğunu göstermektedir. Yenilenebilir enerji tüketimi ve hükümet etkinliği de yeşil büyümeyi destekleyen önemli faktörler olarak ortaya çıkmıştır. Bu sonuçlar, Afrika ülkelerinde sürdürülebilir kalkınma politikalarının AI ve yenilenebilir enerji yatırımlarıyla güçlendirilmesi gerektiğine işaret etmektedir.

Anahtar Kelimeler: Yeşil Büyüme, Afrika Ülkeleri, Yapay Zekâ, Panel Veri Analizi, Dalgacık Spektrum Analizi

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43.

Gine’de Vergi Politikalarının Ekonomik Büyüme Üzerindeki Etkisinin Analizi

Laye Sekou Berete¹

Yunus Emre Birol²

Bu çalışma, 2015 yılının ilk çeyreğinden 2023 yılının ilk çeyreğine kadar olan dönemi kapsayan üç aylık makroekonomik verilere uygulanan zaman serisi yaklaşımıyla, mali politikaların Gine’nin ekonomik büyümesi üzerindeki etkisini analiz etmektedir. Amaç, mali araçların reel GSYİH büyüme oranı üzerindeki kısa ve uzun vadeli etkilerini ortaya koymaktır. Bu amaçla, karışık düzenli $[I(0)$ ve $I(1)]$ entegre serileri işleme ve farklı dinamikleri yakalama kabiliyeti nedeniyle bir ARDL (Otoregresif Dağıtılmış Gecikme) modeli kullanılmıştır. Ko-entegrasyon testlerinin sonuçları (Sınır testi), maliye politikası ile büyüme arasında bir ko-entegrasyon ilişkisi olduğunu doğrulamaktadır. Uzun vadede, madencilik sektörü dışındaki vergi gelirleri büyüme üzerinde olumlu ve önemli bir etkiye sahiptir. Madencilik gelirleri ise olumlu olmakla birlikte, önemli bir etki göstermemektedir. Bu durum Gine’nin boksit ihracatındaki önemine rağmen, bu gelirlerin reel ekonomiye aktarılması konusunda soru işaretleri yaratmaktadır. Öte yandan, cari kamu harcamaları ve yatırım harcamaları büyüme üzerinde olumsuz ve önemli bir etkiye sahiptir, bu da kamu kaynaklarının tahsisinde muhtemel bir verimsizliği ortaya koymaktadır. Ancak kısa vadedeki etkiler daha heterojen görünse de, büyümenin bütçe ayarlamalarına duyarlı olduğunu ortaya koymaktadır. Bu sonuçlar, Gine’nin sürdürülebilir büyümeyi desteklemek için madencilik sektörü vergi gelirlerinin mobilizasyonunu güçlendirmesi ve kamu harcamalarını üretken yatırımlara yönlendirmesi gerektiğini göstermektedir.

Anahtar Kelimeler: Gine, Vergi Politikaları, Ekonomik Büyüme

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44.

Mekânsal Panel Ekonometrik Analiz ile Afrika'da Sürdürülebilir ve Kapsayıcı Büyüme Dinamikleri: Yapay Zekâ, Hava Kirliliği ve Mobil Aboneliklerin Rolü

Emin Ahmet Kaplan¹

İsmail Kıraç²

Bu çalışma, 1996-2024 döneminde dokuz Afrika ülkesinde ekonomik büyüme oranları üzerindeki mekânsal yayılma etkilerini mekânsal panel veri modelleri kullanarak incelemektedir. Bağımlı değişken olarak Gayri Safi Yurtiçi Hasıla büyüme oranının logaritması ($\ln gdp$) alınmış, açıklayıcı değişkenler arasında yapay zekâ bilimsel yayınları ($\ln ai$), yıllık ortalama PM2.5 hava kirliliği maruziyeti ($\ln airp$) ve mobil hücresel abonelik sayısı ($\ln mcs$) yer almaktadır. Global Moran's I testi ile mekânsal bağımlılığın varlığı doğrulanmış ve mekânsal yayılma etkisinin istatistiksel olarak anlamlı olduğu tespit edilmiştir. Klasik En Küçük Kareler (OLS), Mekânsal Lag (SAR) ve Mekânsal Hata (SEM) modellerinin karşılaştırılması sonucunda, SAR modelinin bölgedeki ekonomik büyüme oranlarının mekânsal dinamiklerini en iyi şekilde açıkladığı belirlenmiştir. Elde edilen bulgular, Afrika'da sürdürülebilir kalkınma politikalarının mekânsal etkileşimler dikkate alınarak şekillendirilmesinin önemini vurgulamaktadır.

Anahtar Kelimeler: Mekânsal Yayılma, Ekonomik Büyüme, Afrika, Yapay Zekâ, Hava Kirliliği

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45. 2000 Sonrası Dönemde Türkiye-Afrika İlişkilerini Etkileyen Dinamikler

Abdurrahim Sıradağ¹

Türkiye-Afrika ilişkilerinin tarihi 16. yüzyıla dayanmasına rağmen modern Türkiye tarihinde Afrika kıtası yeterli ilgiyi görememiştir. Türkiye'nin geleneksel batı-odaklı dış politikası Türkiye'nin çok boyutlu ve çok yönlü bir dış politika geliştirmesinin önünde önemli bir engel olmuştur. 2000 sonrası dünya politikasında yükselen küresel ve bölgesel aktörlerin çok boyutlu ve çok yönlü dış politikası Afrika'nın dünya politikasındaki stratejik yerini ve önemini de önemli ölçüde değiştirmiştir. Bu bağlamda jeopolitik olarak önemli bir stratejik noktada bulunan Türkiye'nin 2000 sonrası dış politikası da Türkiye-Afrika ilişkilerinin değişmesine neden olmuştur. Afrika kıtası AK Parti hükümetlerinin stratejik ilgi alanı olmuş ve kıtadaki bölgesel örgütlerle ve kıta ülkeleri ile çok yönlü ve çok boyutlu bir stratejik ilişki kurulması için önemli adımlar atılmıştır. Örneğin, 2003 yılında 5,4 milyar dolar olan Türkiye'nin kıta ile toplan ticareti 2024 yılında 35 milyar doları aşmıştır. Bu çalışma 2000 sonrası değişen dünya politikasında Türkiye-Afrika ilişkilerini hangi boyutta etkilediğini ve AK Parti hükümetlerinin kıta ile stratejik ilişkilerini tartışacaktır.

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46.

Batı Afrika Ekonomik ve Parasal Birlik Ülkelerinde İslami Finansal Kuruluşların Faaliyetleri ve İslami Finansal Araçların Kullanımı

Mehmet Emin Altundemir¹

Abdoulaye Binatè²

İslami finans araçlarının (özellikle Sukuk) UEMOA ülkelerinde altyapı yatırımları, enerji projeleri ve tarımsal kalkınma üzerinde olumlu etkiler oluşturduğu son yıllarda ifade edilmektedir. Ancak yasal çerçeve eksiklikleri, uzman yetersizliği ve farkındalık azlığı sektörün gelişimini sınırlamaktadır. Politika önerileri, bölgesel mevzuat uyumu, kapasite geliştirme ve kamu-özel ortaklıklarının güçlendirilmesi yönündedir.

Anahtar Kelimeler: Batı Afrika, UEMOA, İslami Finans

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47.

Dijital Yönetim Doğal Kaynak Sürdürülebilirliğini Nasıl Etkilemektedir? BRICS-T Ülkelerinden Kanıtlar

Cuma Demirtaş¹

Bu çalışma, BRICS-T ülkelerinde (2003-2021) e-devlet gelişiminin doğal kaynak sürdürülebilirliği üzerindeki etkisini, kantil regresyon analizi kullanarak incelemektedir. Kontrol değişkeni olarak ticari açıklık, finansal gelişme ve teknolojik gelişme değişkenleri kullanılmaktadır. Bulgular, dijital yönetimin doğal kaynak rantlarına olan bağımlılığı azaltmada önemli bir rol oynamaktadır. Bu etki daha yüksek kantillerde güçlenmektedir. Bu durum, halihazırda yüksek kaynak bağımlılığı olan ülkelerde dijital yönetimin daha da büyük bir azaltıcı etkiye sahip olduğu anlamına gelir. Ticari açıklık ise kaynak rantının temel itici gücü olduğunu doğrulamaktadır. Teknolojik gelişme ile finansal gelişme ise istatistiksel olarak anlamlı bir etki göstermemektedir. Bu bulgu teknolojik gelişmeyi temsil eden patent başvuruları ile finans sektörünün gelişmesinin kaynak sürdürülebilirliği üzerinde ölçülebilir bir etkiye sahip olmadığını ima etmektedir. Bu çalışma, dijital hükümet gelişiminin, doğal kaynak sürdürülebilirliğine olan ekonomik bağımlılığı azaltarak doğal kaynakların sürdürülebilirliğini desteklediğine dair ampirik kanıtlar sunmaktadır. BRICS-T ülkeleri için e-yönetim reformlarının hızlandırılması, daha yeşil büyümeye giden stratejik bir yol olabilir.

Anahtar Kelimeler: Dijital Hükümet, Doğal Kaynakların Sürdürülebilirliği, BRICS-T Ülkeleri

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48. EAC ve ECOWAS: Afrika'da Bölgesel Entegrasyon

Süleyman Dal¹

Doğu Afrika Topluluğu (EAC) ile Batı Afrika Devletleri Ekonomik Topluluğu (ECOWAS)'ın karşılaştırılmasına odaklanan bu çalışma; bu iki organizasyonun tarihsel süreçlerinde kritik noktalar nelerdir sorusuna cevap aramaktadır. Betimsel analiz yöntemi kullanılan çalışmada; Afrika Birliği'nin (AfB), EAC ile ECOWAS'ın çalışmaları merkeze alınarak literatür taramasına yer verilmiştir. EAC ile ECOWAS; -arzu edilen hedeflere tam olarak ulaşılmasa da- ekonomik büyümeyi teşvik etme, ticareti kolaylaştırma, yaşam standartlarını yükseltme, altyapıyı geliştirme ve en önemlisi bölgesel iş birliğini güçlendirme konularında etki-
liyken; akademik çalışmalarda yeterince kendine yer bulamamıştır.

Anahtar Kelimeler: Entegrasyon, EAC, Afrika, ECOWAS, Bölge

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49.

Kapsayıcı Büyümenin Finansman Kaynakları: Katılım Finans Sistemi

Erdal Arslan¹

Ali Bora²

Ülkemizde, Bankalar Kanunu'na göre bankalar; mevduat bankası, kalkınma ve yatırım bankası (KYB) ile katılım bankası olarak sınıflandırılmaktadır. Bu banka gruplarından, mevduat bankaları ile KYB'ler faizli bankacılık sistemine göre çalışırken sadece katılım bankaları faizsiz sistem ile çalışmaktadır. Bankacılık sektöründe, aktif büyüklüğe göre, 2024 yılında mevduat bankalarının payı %85,7, KYB'lerin payı %5,8 ve katılım bankalarının payı ise %8,5 olmuştur. Buna göre bankacılık sektörünün %91,5'i faizli sisteme göre fon toplayıp bu fonu yine faizli sisteme göre kullanırken, sadece %8,5'i faizsiz sisteme göre fon toplayıp fon kullanılmaktadır. Bu duruma göre, "Kapsayıcı Büyümenin Finansman Kaynakları"nın yaklaşık %92'si faizli sistem üzerinden olmak zorunluluğu ortaya çıkmaktadır. İşte burada "Kapsayıcı Büyümenin Finansman Kaynakları" açısından "Kapsayıcı Büyüme İçin Ekonomik Dönüşüm" finansal sistemde dönüşümü gündeme getirmektedir. Finansal sistemde dönüşüm, faizsiz finans sisteminin ekonomideki ağırlığının artması ile gerçekleşebilecek ve kapsayıcı büyüme için faizsiz finansman kaynaklarını ortaya çıkaracaktır. Faizsiz finans sistemi veya "Katılım Finans Sistemi; Katılım Finans Kurumları, Katılım Sermaye Piyasaları ve Katılım Sigortacılığında oluşmaktadır". Katılım finans sisteminde; "risk paylaşımı, varlığa dayalı sistem olması ve ahlaki vurgu" temel çerçeveyi oluşturmaktadır. Katılım finans sistemi için; "yeni finansal mimarinin inşası, yeni (faizsiz) finansal model önerisi ve (özellikle faizli) küresel finansal araçlara alternatif (faizsiz) finansal araçlar geliştirmek önem arz etmektedir. Katılım finansal sistemin kurulabilmesi için; "hukuki, idari ve kurumsal altyapın"ın oluşturulması zorunludur.

Anahtar Kelimeler: Katılım Finans Sistemi, Katılım Finans Kurumları, Katılım Sermeye Piyasaları, Katılım Sigortacılığı

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50.

Güney Afrika Yaşama Seçimlerinin Çok Yönlü Analizi 1994-2024: Parti Sistemi, Efektif Parti Sayısı, Orantılılık, Katılım ve Kadın Temsilci Oranları

Ali Tezcan¹

Bu çalışmada Güney Afrika'nın 1994-2024 arasında gerçekleşen yedi yasa ma meclisi seçimi, parti sistemi, efektif parti sayısı, orantılı sandalye dağılımı, katılım ve kadın temsilci oranları açısından karşılaştırmalı bir analize tabi tutulacaktır. Bu doğrultuda ülkede, hâkim partinin güç kaybıyla birlikte parti sistemi çok partili sisteme doğru yön değiştirmekte ve efektif parti sayıları yükselmektedir. Orantılı sandalye dağılımında dünyanın en iyi örneği olarak sahnede yer almakta ve kadın temsilci oranlarında oldukça başarılı seviyelerde bulunmaktadır. Öte yandan siyasete olan güven kaybıyla birlikte katılım oranları ciddi düzeyde azalmakta ve siyasi kültürün seçimsel demokrasiye uygunluğu konusunda tereddütler doğurmaktadır. Güney Afrika seçim kurumları ve uygulamaları, karşılaştırmalı seçim sistemleri konusunda çalışan akademisyenler için incelemeye değer oldukça güzel bir laboratuvar olarak karşımızda durmaktadır. Ülkenin sömürge düzeninden kurtulup demokrasiye geçişinin ardından seçim kurumunun işleyişinin zaman içindeki seyrine yönelik analiz ve değerlendirmeler, diğer demokrasiye geçiş sürecindeki ülkeler için de yol gösterici olacaktır.

Anahtar Kelimeler: Seçimler, Güney Afrika, Orantılılık, Katılım, Temsil

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51.

Afrika'da Yeşil Büyüme ve Kapsayıcı Kalkınma: Ticaret Açıklığı, Yenilenebilir Enerji ve Çevre Politikalarının Rolü

Nil Sirel Öztürk¹

Bu çalışma, Afrika'nın gelişmekte olan ekonomilerinde kişi başına düşen gelir düzeyini belirleyen faktörleri analiz ederek, sürdürülebilir ve kapsayıcı büyüme dinamiklerini ortaya koymayı amaçlamaktadır. 2000–2021 dönemini kapsayan panel veri seti; Kenya, Tanzanya, Güney Afrika, Mısır, Fas, Senegal, Uganda ve Angola'dan oluşan sekiz ülkeyi içermektedir. Bağımlı değişken olarak kişi başına düşen gelir alınmış; karbon yoğunluğu, ticaret açıklığı, doğrudan yabancı yatırım girişleri, yenilenebilir enerji kullanımı ve kentleşme oranı açıklayıcı değişkenler olarak modele dahil edilmiştir. Panelin heterojen ve yatay kesit bağımlılığı içeren yapısı nedeniyle AMG ve CCEMG yöntemleri uygulanmış, sonuçların sağlamlası için System GMM tahminleri ve Dumitrescu-Hurlin Granger nedensellik testleri gerçekleştirilmiştir. Elde edilen bulgular, karbon yoğunluğunun büyümeyi desteklediğini; buna karşılık yenilenebilir enerji kullanımının büyüme üzerinde negatif etkide bulunduğunu göstermektedir. Ticaret ve sermaye girişlerinin etkisi zayıf ve istikrarsızdır. Kentleşme bazı ülkelerde pozitif etkili olsa da genellenabilir değildir. Bu sonuçlar, kısa vadeli büyüme ile çevresel sürdürülebilirlik arasında bir ikilem olduğunu ve yeşil büyümenin kurumsal kapasiteyle desteklenmesi gerektiğini ortaya koymaktadır.

Anahtar Kelimeler: Sürdürülebilir Büyüme, Karbon Yoğunluğu, Yenilenebilir Enerji, Dışa Açıklık

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52.

Afrika'da Sömürgecilik ve Dini Yaşam: Ekonomik Yapı Üzerinden Bir Değerlendirme

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Bu çalışma, Afrika kıtasının sömürgecilik süreciyle şekillenen ekonomik yapısını ve bu yapının dini yaşantı üzerindeki etkilerini ele almaktadır. 19. yüzyılın sonlarından itibaren İngiltere, Fransa, Almanya, Belçika ve İspanya gibi büyük güçlerin Afrika topraklarını paylaşarak kıtanın doğal kaynaklarını sistematik biçimde sömürgeleştirdiği görülmektedir. Sömürgecilik faaliyetleri, Afrika'nın ekonomik bağımsızlığını ortadan kaldırmış, yeraltı zenginlikleri Batılı devletlerin çıkarlarına tahsis edilmiş ve kıta, yoksulluk, iç savaş, siyasi istikrarsızlık gibi yapısal sorunlarla baş başa bırakılmıştır. Bu çerçevede, Afrika'ya yardım adı altında uygulanan uluslararası ekonomi politikaları, yeni sömürgecilik biçimlerine evrilmiş; bağımlılık ilişkilerini derinleştirerek kıtanın kendi potansiyelini gerçekleştirmesini engellemiştir. Afrika toplumları, temel insani ihtiyaçlarını karşılayamayacak düzeyde bir yoksullukla karşı karşıya kalmış; açlık, susuzluk, sağlık ve güvenlik gibi yaşamsal sorunlar, dini ve ahlaki yönelimlerin ötelenmesine neden olmuştur. Eğitim, sağlık ve adalet gibi alanlarda yaşanan eşitsizlikler, toplumsal bütünleşmeyi zedelemiş ve uzun vadeli kalkınma planlarının oluşturulmasını imkânsız kılmıştır. Ayrıca Batılı ülkelerin kıtanın genç ve dinamik nüfusunu ucuz iş gücü olarak değerlendirmesi, demografik potansiyelin bir avantajdan çok kontrol edilmesi gereken bir unsur olarak görülmesine yol açmıştır. Bu durum, Afrika toplumlarının siyasi, ekonomik ve kültürel alanlarda bağımsız hareket edememesine neden olmuş; farklı baskı odaklarının kıta üzerindeki etkisi, Afrikalı halkların kendi kaderlerini

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tain etme iradesini zayıflatmıştır. Sonuç olarak bu bildiri, Afrika'daki ekonomik sömürünün yalnızca maddi değil; aynı zamanda dini, kültürel ve sosyal alanlarda da ciddi tahribatlar oluşturduğunu savunmakta; kıtanın özgün yapısının yeniden inşası için çok boyutlu ve adil bir yaklaşımın gerekliliğini vurgulamaktadır.

Anahtar Kelimeler: Sömürgecilik, Afrika, Din, Ekonomik Bağımlılık, Eşitsizlik

53.

Tarihi Süreç İçinde Etiyopya Sudan ve Mısır: Sürdürülebilirlik ve Kalkınmanın Anahtarı Su ve Ekonomisi

Halil İbrahim Gül¹

Sahra altı Afrika'nın kalbi ya da merkezi Etiyopya, Sudan ve Mısır üçlüsünden geçmektedir. Bu bölge sanayi, ziraat ve ticarete birbirlerine rekabet etmekle beraber aynı zamanda birbirlerini tamamlayıcı konumdadırlar. Özellikle bu bölge çok eski çağlardan beri Nil nehri ve sularının kaynağı olmuştur. Bu kaynak ise savaş ya da barışın aynı zamanda kalkınmanın anahtarı olma özelliğini yüklenmiştir. Bölgenin suya dayalı ekonomisi üç ülke içinde büyük önem taşımaktadır. Özellikle Nil nehrinin kaynağı olan Etiyopya suyu daha fazla değerlendirmek için yatırımlar yapmıştır. Etiyopya kalkınma ve sürdürülebilirliğin anahtarı olarak Nil nehri-ne stratejik yatırımlar yapmıştır. Bu yatırımların etkilerinin ülke içinde bir gelişme yapması beklenmektedir. Ancak Sudan ve Mısır ekonomisini nasıl etkileyeceği henüz bilinmemektedir. Dolayısıyla yakın gelecekte Nil ve suları iktisadi bir gerçek olarak karşımıza çıkmaktadır. Etiyopya'nın kurduğu Rönesans barajı (Milenyum, Nahda, Gerd) Nil havzasındaki dengeleri değiştirebilecektir. Afrika'nın en büyük barajı ve 4 milyar dolardan fazla maliyete sahip olacak bu baraj Afrika ekonomisine yön verecek ve ülkelerin zenginlik ve fakirlik sıralamasını değiştirecektir. Kalkınma hamlelerini Sudan ve Etiyopya'ya göre daha önce başlatan Mısır, Etiyopya içinde suların tutulması sonucu tarım ve ticarete önemli derece hasıla ve gelir kaybına uğrayabilecektir. Sudan ise diğer iki devlete göre daha zayıf ve yaptırım gücü daha az bir ülke konumundadır.

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2025 ortasıyla beraber yaklaşık 135 milyon nüfusu olan Etiyopya su ve su öncelikli kalkınma modelini benimsemiştir. GSMH ve büyüme oranı devamlı artan ülkenin Nil suları ve Rönesans barajının etkisiyle dahada artması beklenmektedir. Ancak iklim değişikliği nedeniyle Nil sularında bir azalma olursa Etiyopya, Sudan ve Mısır her üç ülkenin de olumsuz etkileneceği muhakkaktır. Afrika'nın en kalabalık üç ülkesi arasında yer alan Etiyopya ve Mısır Nil nehrine bağımlılıkları geleceklerini belirleyecektir.

Nil nehri suları bir anlaşma olarak ilk defa 1929 yılında İngiltere ve Mısır arasında yapılmıştır. Daha sonra farklı dönemlerde yeni anlaşmalar yapılmıştır. Ancak 20. yüzyıla beraber Etiyopya'nın gelişip zenginleşmesi su ekonomisini başka bir boyuta taşımıştır.

Asıl tehlike Nil sularına diğer komşu ülkelerinde baraj inşa ederek suyun akışının azalması ya da tamamen kesilmesidir. Bölge ülkelerin refahı için suya bağımlılığın azaltılması ve yeni teknolojilerin geliştirilmesi önem arz etmektedir.

Anahtar Kelimeler: Su, Baraj, Afrika, Ekonomi, Kalkınma

54.
COVID-19 Salgınının
Tetikleyici Krizlerin İnşaat Sektörü ve
Konut Satışları Üzerindeki Etkisi:
Türkiye Örneği

Murat Celal Çınar¹

Covid-19 pandemisi, tüm dünyada olduğu gibi Türkiye’de de halk sağlığını koruma amacıyla bir dizi önlemin hayata geçirilmesini gerektirmiştir. Sağlık açısından kaçınılmaz olan bu tedbirler, birçok sektörde ekonomik zorlukların ortaya çıkmasına neden olmuştur. Bu çalışmada, Türkiye’de inşaat sektörü ve konut piyasası üzerinde Covid-19’un oluşturduğu etkilerin incelenmesi amaçlanmaktadır.

Anahtar Kelimeler: Covid-19, Salgın, Karantina, Ekonomi

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55.

Digital Finance and Poverty in Fragile States: Evidence from Somalia's Mobile Money Diffusion

Arab Dahir Hassan¹

Financial inclusion is increasingly recognized as a catalyst for achieving the Sustainable Development Goals (SDGs), particularly in reducing poverty (SDG 1), ensuring food security (SDG 2), and promoting reduced inequalities (SDG 10). In fragile states such as Somalia, where decades of conflict and institutional weakness constrain formal financial systems, digital financial services have emerged as a critical alternative. This study investigates the determinants of household wealth in Somalia using nationally representative data from the Somali Demographic and Health Survey (SDHS), comprising 26,180 households after cleaning. Wealth is measured via the standardized Wealth Index, with explanatory variables capturing demographic, socioeconomic, and infrastructural conditions-including household size, education, property ownership, electricity access, and mobile money use. Ordered logit and probit models are employed to assess these relationships. The results demonstrate that access to mobile money significantly enhances household wealth, alongside educational attainment, electricity supply, and secure home ownership. Spatial disparities are observed, with northern and eastern regions outperforming the conflict-affected south, while rural and nomadic households remain structurally disadvantaged. These findings highlight the transformative role of mobile money in advancing financial inclusion, while also emphasizing the need for complementary investments in infrastructure and education to ensure equitable development. Policy efforts should prioritize expanding digital financial services, bridging urban-rural divides, and addressing geographic inequalities to accelerate progress toward SDG 1, SDG 2, and SDG 10 in Somalia.

Keywords: FinTech, Financial Technology, Mobile Money, Poverty, Wealth index, Somali Demographic and Health Survey, Financial Inclusion.

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56.

The Relationship between Trade Volume and Political Relations: Example of Türkiye and Ethiopia

Ahmet Fatih Kaya¹

The relationship between political relations and mutual trade is one of the most critical topics for policymakers. It would not be surprising to see that developing relations between countries enables the development of international trade. This paper posits that developing political relations enables an increase in trade volume. By signing agreements involving military cooperation, having reciprocal visits entails national companies to trade with new partners, as well as attracting the interest of investors. In this context, Türkiye's international relations with Ethiopia are examined, and its effects on the trade volume will be investigated. While conducting this analysis, available data will clarify our premises. The findings reveal that developing political relations has an impact on increasing trade volume between countries.

Keywords: International Relations, International Trade, Military Cooperation, Mediation Role, Trade Volume

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57.

Examining the Impact of Fiscal, Monetary, and Trade Policy on Environmental Quality in Nigeria

Ibrahim Aminu Jamiu¹

This study examines the impact of fiscal, monetary, and trade policies on environmental quality in Nigeria over the period 1990 to 2025. As a resource-dependent economy, Nigeria's macroeconomic policies have often prioritized growth and stabilization with limited attention to their environmental consequences. However, with growing environmental degradation, energy-related emissions, and Nigeria's commitment to sustainable development, understanding the relationship between macroeconomic policy instruments and environmental quality has become increasingly critical. The study aims to assess how government spending, monetary expansion or contraction, and trade openness have influenced environmental quality. A quantitative time series econometric technique will be employed, key tools will include Augmented Dickey-Fuller tests, Johansen cointegration, Vector Error Correction Models (VECM), and Granger causality tests will be used to estimate both short- and long-run relationships between the variables. The expected findings will provide insight into how macroeconomic policy frameworks can be reoriented to align economic management with environmental sustainability. The study will contribute to the policy discourse by offering recommendations for integrating environmental considerations into fiscal, monetary policy design, and trade policy formulation in Nigeria.

Keywords: Fiscal Policy, Monetary Policy, Trade Policy, Environmental Quality, Nigeria.

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58.

AI and the Sustainability of Indigenous Nigerian Languages

Donatus Emenike¹

The study explores the opportunities and challenges that Artificial Intelligence (AI) offers in the preservation and sustainability of Nigerian indigenous languages. In recent years AI has emerged as a valuable tool that drives human activities, particularly in providing innovative approach to problem solving. Research shows that indigenous Nigerian languages are endangered and face the risk of extinction if nothing urgent is done. The application of AI enabled technology helps to create and preserve language resources and provide remote language learning networks that create real time and user-friendly experiences. There are, however, limitations in the Nigerian environment as there are paucity of indigenous language data and digital skill know-how. It is believed that by examining the interface between AI and language, the present study hopes to contribute to the research effort that prioritizes the preservation and sustainability of indigenous Nigerian languages.

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59.

Artificial Intelligence for Academic Administration: Issues Towards Teaching, Training and Research

Patricia Nkem Asoya¹

Artificial Intelligence (AI) is transforming the landscape of tertiary education universally as it has been identified as possessing great potentials for changing and enhancing work processes. Its role transcending academic functions from traditional processes to more modern and automated operations is assured to enrich teaching efficiency, training and research activities. It is against this backdrop that this study explored the significance of integrating Artificial Intelligence (AI) in teaching, training and research for improved efficiency and performance. The paper anchored on the Technology Acceptance Model (TAM) with special focus on how humans perceive and adopt new technologies. The descriptive survey research design was adopted with data generated from secondary sources. Findings from the study revealed that AI-driven technologies have significant impact on teaching methodologies, academic staff development and research revolutionization in tertiary institutions. However, key challenges such as limited infrastructural availability and ethical concerns amongst others were identified as factors limiting AI integration in academic administration. Drawing from the findings of the research, the study concluded by proffering strategic recommendations such as curriculum redesign and infrastructural investment for enhanced adoption of AI in academic settings towards attaining holistic educational advancement.

Keywords: Artificial Intelligence, Technology, Research

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60.

Exploring AI-Driven Transformation in Communication and Institutional Management for 21st Century Polytechnics

Anho Erere Joy¹

This study examines the transformative role of Artificial Intelligence (AI) in reshaping communication and institutional management within 21st century polytechnics. As global education systems evolve, polytechnics face increasing demands for efficiency, innovation and responsiveness to societal and industrial needs. While substantial literature discusses AI in higher education generally, there is a lack of literature that captures a holistic view of the transformative role of AI in communication and institutional management. It is against this background that this study examines how AI technologies are revolutionizing administrative processes, enhancing decision-making and streamlining internal and external communication. It also investigates the implications of AI for staff development, student engagement and institutional governance. A mixed-methods research design, which combines qualitative and quantitative approaches, will be adopted in this study. Ultimately, the study will contribute to understanding the transformative impact of AI in reorganizing communication and institutional management for inclusive growth.

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61.

Crash Risk Contagion Across BRICS and Turkey: Insights from Nonlinear and ML Models

William Bwando¹

Emerging markets increased financial integration has enhanced the propagation of systemic risks across borders, mainly crash risks. This paper addresses the crash risk transmission across the BRICS nations (Brazil, Russia, India, China, South Africa) and Turkey. Observing their potential roles as transmitters or receivers of risk during calm and turbulent times, the research utilizes nonlinear econometric techniques, and machine-learning methods to study the dynamic relations in crash risk transmission, measured via Down-to-Up Volatility (DUVOL) and Negative Conditional Skewness (NCSKEW). Nonlinear interrelationships were detected, being highly pronounced during turbulent regimes. Granger causality tests and Generalized Additive Models (GAM) uncovered asymmetric spillovers, where India and China appeared to be the most potent transmitters of crash risk while Turkey and South Africa were the most susceptible receivers. Markov Regime-Switching VAR-type models also confirmed regime-dependent behavior, with the crisis periods strengthening cross-market contagion due to investor panic, shortage of liquidity, and the rise of shocks caused by geopolitical issues. Through XGBoost feature importance analysis, China and Russia were pinpointed as key transmitters of crash risk to other markets, governed mostly by trade linkages and commodity dependencies. The paper outlines the recommendations for diversified portfolios, improved regulatory coordination structure, and the development of early warning systems to counter systemic risk build-up in emerging markets.

Keywords: Crash Risk, BRICS, Turkey, Financial Contagion, Nonlinear Dynamics, Machine Learning, Regime-Switching Models

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62.
**“Patterns in Economic History”:
Economic Triggers in the Post-Covid
Era and the U.S. Yield Curve?**

Ayatullahi Seidu¹

The yield spread is known to have a good predictive ability of economic activity. In about the Fall of 2023, a Deutsche Bank comparative study revealed that in the U.S., four of the macro triggers that were most commonly associated with recession became imminent. Using monthly data from January 2020 to September 2023, we attempted to study this system of variables relative to the yield curve. Among other things, we found that the counter-cyclical monetary policy model, which states that the yield curve moves in the direction of monetary policy, was relatively more pronounced, which was characteristic of the immediate post-COVID monetary policy path. However, this was short-lived, as the yield spread responded negatively only in the first three months and normalized thereafter. If a “technical recession” is referred to as an overall decline in economic activity for two to three quarters, contrary to the Deutsche Bank research, we subsequently inferred that an imminent recession was less likely.

Key Words: Yield curve, U.S., Recession, Deutsche Bank, Macro Triggers

JEL: C32, E43, G12, N12

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63.

Three New Measures of Microfinance Intensity for Cross-Country Studies

Syed Muhammad Usman Masood¹

Hassan Zada²

Microfinance, and the research on its impact, has grown significantly over the last few decades (Pattnaik et al., 2024). Studies that take a macroeconomic approach to studying microfinance rely on measures such as the Gross Loan Portfolio (GLP)/population to determine loans per person or GLP/GDP. But these measures standardize microfinance loans with respect to variables representing either the whole country or the overall economy. It may give a good idea of the penetration of microfinance in the economy, but not its intensity. We endeavor to avoid this problem by proposing 3 new measures of microfinance intensity for cross-country investigations: Gross Loan Portfolio per poor person (GLP/poor), Active Borrowers as a proportion of the poor population (borrowers/poor), and Microcredit as a percentage of total private sector credit (GLP/credit). The first two measures we propose give the intensity of the microfinance lending among only the poor. Our third measure standardizes microfinance on the basis of overall credit in the market, which automatically takes into account the financial development of a country. Our results show that the measures proposed here are highly correlated with three established measures in the literature, are more precise than older measures, and provide greater variation in data. This allows researchers draw a clearer picture of the relationship of microfinance intensity in a country with other economic and social indicators.

Keywords: Microcredit, Microfinance, Measures, Microfinance Intensity, Microfinance Institutions, Banks

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64.

Using Sustainability to Heal the Wounds of Fatalities in Mining: An Economic and Social Perspective

Hannah Kemevor¹

Mining fatalities have a significant impact on workers, their families, and local communities, leading to economic and social hardships that can persist long after the event. This presentation examines the role of sustainability in alleviating the economic and social consequences of mining fatalities. We will explore how sustainable practices in mining can foster economic growth, emphasize social responsibility, and aid community development. In particular, we will underscore the significance of effective waste management strategies that not only minimize environmental harm but also generate job opportunities through land rehabilitation, waste-to-resource technologies, and community involvement. Through case studies and examples of best practices, we will highlight strategies that mining companies can implement to support workers, their families, and local communities affected by fatalities while advancing sustainable development and environmental protection. The presentation will also address the importance of engaging stakeholders in promoting sustainable mining practices. By sharing knowledge and experiences, we aim to raise awareness about the critical role of sustainability in the mining sector and encourage the industry to adopt sustainable practices that prioritize social and economic responsibility. Sustainability plays a crucial role in mitigating the economic and social effects of mining fatalities by promoting responsible practices that protect workers and communities. Effective strategies include providing support for affected workers, their families, and local communities, while implementing sustainable mining approaches that emphasize both social and economic responsibility. Best practices in this area focus on enhancing safety, improving waste management to minimize environmental damage and generate employment opportunities, and ensuring active stakeholder engagement to advance long-term sustainable mining practices.

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65.

The Impact of South-South Cooperation on Industrial Development: An Analysis of the Turkey-Africa Economic Partnership

Mohammed Zeinu Hassen¹

This paper examines the impact of the burgeoning Turkey-Africa economic partnership on industrial development within African nations, framed within the broader context of South-South Cooperation (SSC). As emerging economies seek alternative development pathways, the Turkish model, characterized by a blend of trade, investment, and institutional support, presents a compelling case study. This research utilizes a qualitative methodology, drawing on secondary data from international organizations, government reports, and academic literature to analyze the mechanisms through which this partnership influences industrialization. The analysis focuses on three key channels: (1) trade dynamics and their effect on industrial inputs and outputs; (2) the sectoral concentration and local linkages of Turkish Foreign Direct Investment (FDI); and (3) the role of Turkish institutions like the Turkish Cooperation and Coordination Agency (TİKA) and Turkish Airlines in creating an enabling environment. Findings indicate that the partnership has contributed positively to specific sectors, particularly construction, textiles, and agro-processing, through infrastructure development and capital injection. However, the extent of technology transfer and the creation of deep linkages with local small and medium-sized enterprises (SMEs) remain uneven. The paper argues that while the Turkey-Africa partnership serves as a potent example of SSC, maximizing its contribution to sustainable and inclusive industrial development requires more deliberate policy alignment from both Turkish and African

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stakeholders. It concludes with policy recommendations aimed at enhancing local value addition, promoting skills transfer, and ensuring that the benefits of this cooperation are broadly distributed, thereby forging a genuine pathway to inclusive growth for emerging African countries.

Keywords: South-South Cooperation, Industrial Development, Turkey-Africa Partnership, Foreign Direct Investment (FDI), Inclusive Growth, Emerging Economies

66.

Africa Policies of the Member States of the Organization of Turkic States: A Comparative Political Economy Assessment

Alptekin Cihangir İşbilir¹

Bu çalışmada Türk Devletleri Teşkilatı (TDT) üyesi ülkelerin, Soğuk Savaş sonrası, Afrika ülkeleriyle olan ekonomik ilişkileri karşılaştırmalı olarak ele alınacaktır. Bu analiz yapılırken politik motivasyonlar dikkate alınacak ve karşılıklı mevcut ticari hacimlerle birlikte muhtemel potansiyeller de tartışılacaktır.

TDT üyesi ülkelerinin bulunduğu Orta Asya, Hazar Havzası ve Güney Kafkasya gibi Afrika'nın birçok bölgesi de günümüzde büyük güç rekabetinin sahnesi olmaktadır. Bu itibarla TDT üyesi ülkelerin Rusya, ABD, Çin ve AB başta olmak üzere küresel güç odaklarının Afrika politikalarından etkilenmemeleri çok zordur. Dolayısıyla TDT üyelerinin Afrika politikaları ve Afrika ülkeleriyle olan ticari ilişkileri küresel güçlerin politikalarına ne kadar eklemlenmiş veya ne kadar uyumlu olduklarını tespit etmek de bu çalışmanın amaçlarından biridir. Bu durumun avantajları kadar dezavantajlarının olduğu şüphesizdir. Müstakil politikalar geliştirmek isteyen TDT üyesi ülkeler için meydan okuma olabilecek özel durumlar ayrıca çalışmada analiz edilecektir.

TDT'nin önemli bir üyesi olan Türkiye'nin Afrika ile olan tarihi ve kültürel bağları ve 2005'ten beri gittikçe ivmelenen ve kurumsallaşan Afrika açılımı politikaları TDT üyesi ülkeler için önemli bir avantaj teşkil etmektedir. Türkiye'nin Afrika açılımı ile eş zamanlı gelişen ekonomik ilişkilerinin TDT üyesi diğer ülkelere olan etkisini değerlendirmek bu bildirinin asıl hedeflerinden birisidir. TDT üyesi ülkelerin diğer birçok sahada olduğu gibi Afrika politikaları ve Afrika ile ticari

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ilişkilerde de koordinasyon içinde olmaları ve iş birliği yapmaları çok büyük avantajlar doğurmaktadır. Bu bağlamda normatif, kurumsal ve operasyonel iş birliği ve koordinasyon mekanizmalarının verimliliği bu çalışmada tartışılacaktır. Böylelikle olması gereken iş birliği ve koordinasyon mekanizmaları ile ilgili bir politika notu ve teklifler seti oluşturulmaya çalışılacaktır. Hiç şüphesiz her ülkenin üretim kapasitesi ve ürün çeşitliliği farklıdır ve yapılan ve inşa edilmesi gereken iş birliği mekanizmaları buna göre düzenlenmelidir. Çalışmanın sonuç kısmında bu verilere göre bir değerlendirme yapılarak öneriler seti hazırlanmaya çalışılacaktır.

Anahtar Kelimeler: Türk Devletleri Teşkilatları, Afrika, Ekonomi, İş Birliği

67.

Empowering a Generation: Transforming Public Service through Youth Fellowships: A Case of EPL Operational Countries in Africa

Richard Okai¹

MemoryChilapondwa²

The African Union (2017) highlights Africa’s demographic dividend as a critical opportunity for accelerating development. However, realizing this potential depends on strategic investments in youth empowerment and public sector transformation. Across the continent, young people constitute a significant share of the population but often lack the pathways, resources, and platforms to meaningfully engage in governance and public service leadership.

The Emerging Public Leaders (EPL) Fellowship Program addresses this gap by recruiting, training, and placing talented, ethical, and motivated young professionals into key roles within government ministries, departments, and agencies across Liberia, Kenya, Ghana, Sierra Leone, and Malawi. This program aims to cultivate a new generation of agile, competent, and values-driven public sector leaders capable of advancing institutional reforms and driving systemic change.

Using a mixed methods approach –document reviews, and institutional data– the paper examines the transformative impact of EPL’s fellowship model in these five operational countries. It explores how young fellows contribute to strengthening public administration, improving policy implementation, and enhancing responsiveness to citizen needs.

The study argues that fostering youth leadership within public service not only aligns with national and continental governance agendas (including AU’s

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Agenda 2063) but also serves as a critical strategy for unlocking Africa's demographic dividend and promoting inclusive, sustainable development. The paper concludes by proposing a framework for scaling this model across additional countries, highlighting lessons learned and best practices for integrating youth into public sector leadership pipelines.

Keywords: Youth Empowerment, Demographic Dividend, Public Service, Leadership, Governance, Sustainable Development, Africa, Agile Public Administration

68.

**Strengthening Public Sector Governance
through Youth Leadership and Strategic Partnerships:
Evidence from Emerging Public Leaders
Fellowship Program in Africa**

Richard Okai¹

Winnie Shella²

In many African countries, public institutions face several challenges including limited human resource capacity, poor coordination and outdated systems. Vulnerable groups including youth and women are underrepresented in public service space, and the marginalized groups are often excluded. The Emerging Public Leaders (EPL) program seeks to address these issues by strengthening the talent pipeline into government through the recruitment and placement of highly, skilled, ethical and motivated young leaders. Through targeted efforts to empower youth and women, EPL also directly addresses issues of representation and equity in governance.

This paper aims to gain an in-depth and contextualized understanding of how EPL's fellowship program contributes to strengthening governance through public service youth leadership and how strategic institutional partnership contributes to sustainable development. This paper uses a mixed method approach including (a) document review (b) online surveys (c) key informant interviews and (d) focus group discussions across Ghana, Liberia, and Malawi.

The paper argues that if institutions, governments and partners invest more in public service leadership development programs that prioritize youth inclusions, evidence informed decision making and long-term institutional partnerships, they can strengthen governance systems by fostering accountable, innovative, and future-ready public sectors.

Keywords: Youth Leadership, Public Service, Governance, Institutional Capacity, Strategic Partnerships, Sustainable Development

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A Historical Analysis of Ghana's Economic System: A Post-Colonial View

Jacqueline Adjoa Lemmdi-Prikutse¹

Ayatullahi Seidu²

Abstract

Ghana's economic system has evolved significantly from its precolonial period, through colonial times to its post-colonial period. This study revisits the post-colonial evolution of Ghana's economy, structurally analyzing the political transitions, structural reforms, and institutional shifts that shaped its growth trajectory. The central hypothesis posits that while Ghana has demonstrated resilience through diversification and reforms, its dependence on primary commodities and external financing remains a barrier to structural transformation. The study employs a qualitative historical approach, synthesizing secondary data from the World Bank, UNDP, and national policy archives. Archival materials were used to trace changes in economic strategies across four key periods: the First Republic, the era of Economic Instability and Decline, the Structural Adjustment phase, and the Modern Economy. Findings reveal cyclical phases of state-led industrialization, market liberalization, and resource exploitation. Despite growth during the 2000s, Ghana's economy remains highly exposed to external shocks, environmental degradation, and fiscal constraints due to persistent debt accumulation. The study, therefore, recommends that Ghana's path toward sustainable development requires renewed emphasis on industrial diversification, human capital enhancement, and effective policy consistency. All this without the necessary political will as evidenced in Ghana's growth path, we argue, would be baseless. Similarly, the proposed Twenty-Four-Hour-Economy Policy by the current government offers potential for productivity expansion and employment, but its success, like all policies, hinges primarily on political will and continuity in implementation.

Keywords: Economic History, Comparative Economic Systems, Structural Analysis, Postcolonial, Ghana

JEL: H11, N97, P41, P51

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Introduction

Since independence in 1957, Ghana has undergone significant economic transformations driven by political changes, development ideologies, and global economic pressures. Understanding this evolution provides insights into the persistent economic challenges facing the country and helps inform current policy directions such as the Twenty-Four-Hour Economy initiative, which the current Government seeks to implement.

This paper analyzes Ghana's economic evolution in four phases: (1) The First Republic under Kwame Nkrumah (1960-1966), (2) Economic instability and decline (1966-1982), (3) Structural reforms under the Economic Recovery Program (ERP) and/or Structural Adjustment Program (SAP) (1983-1999), and (4) The modern economy (2000-date). By focusing on these phases, the paper demonstrates how governance, international institutions, and resource dependency shaped Ghana's development trajectory.

This paper is organized as follows: A section on Introduction which gave a background to the paper, the Literature Review section that summarizes some key scholarly works on the evolutionary path of Ghana's economic system and highlights the authors' contribution, the Materials and Methods section that elucidates the methodology employed and characteristics of the data used in this analysis and finally The Conclusion section which provides a summary of the work, detailing its key findings.

Literature Review

Scholarly analysis of Ghana's economic evolution trajectory emphasizes the interplay between governance, policy shifts, and structural transformation. Killick (2010) highlights Nkrumah's interventionist strategies, while Osei-Hwedie (1985) and Bofo-Arthur (1999) link political instability to weak economic outcomes. Konadu-Agyemang (2000) attributes uneven growth to external dependency, and Aryeetey and Fenny (2017) emphasize globalization and policy reform as key drivers of modern economic performance.

This paper contributes to literature by linking these phases into a single narrative of political transitions, institutional reforms, and external interventions shaping Ghana's pursuit of inclusive growth from 1960 to 2024. Drawing on historical and economic literature, this study demonstrates that Ghana has alternated between state-led and market-oriented policies, often shaped by external shocks and conditionalities.

Materials and Methods

This study adopts a qualitative historical method to examine Ghana’s economic evolution from 1960 to 2024, drawing primarily on secondary data collected on a yearly basis from the United Nations Development Programme (UNDP), World Bank database, and the Observatory of Economic Complexity. The analytical framework employed is a structural-comparative and historical approach, chosen because it aligns with the study’s objective of tracing institutional, ideological and policy evolution.

This framework provides a comprehensive understanding of the long-term shifts in Ghana’s economic systems within their political and global contexts. Key variables such as External debt, GDP and population growth, the Human Development Index (HDI), and the Economic Complexity Index (ECI) were analyzed to evaluate economic progress and structural changes over time.

Results and Discussion

The visuals below summarize the key indicator variables analyzed and highlight some structural and economic changes over the period under review.

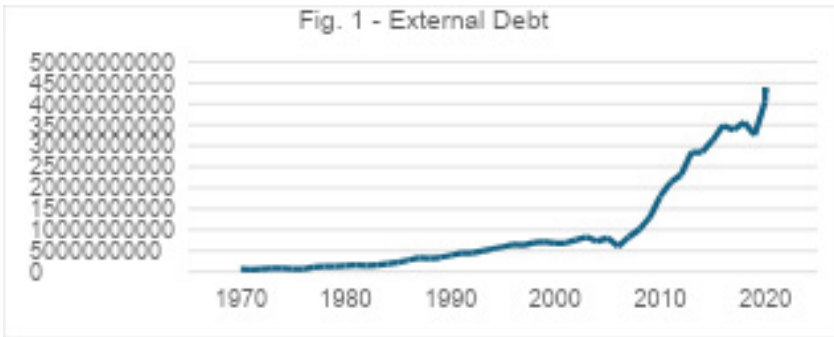


Figure 1. External Debt from 1970-2023.

Source: World Bank, 2023.

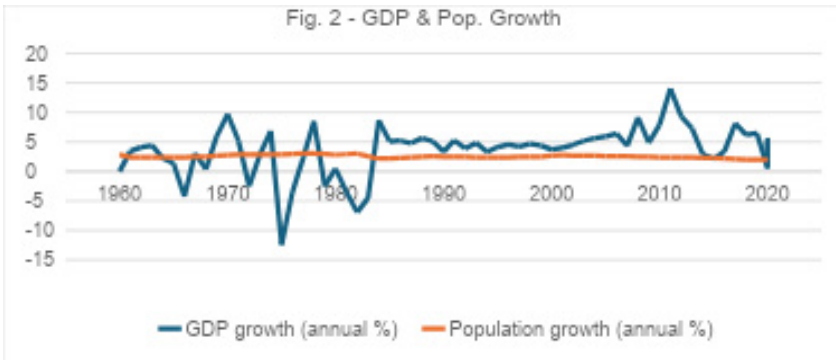


Figure 2. Nominal GDP and Population Growth from 1960-2024.
Source: World Bank, 2024.

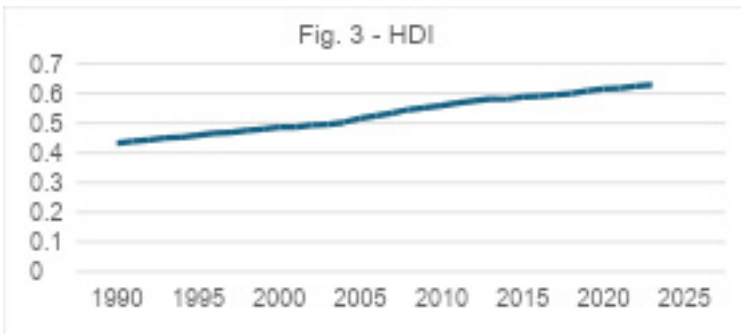


Figure 3. Human Development Index (HDI from 1990-2023).
Source: United Nations Development Programme (UNDP), 2023.

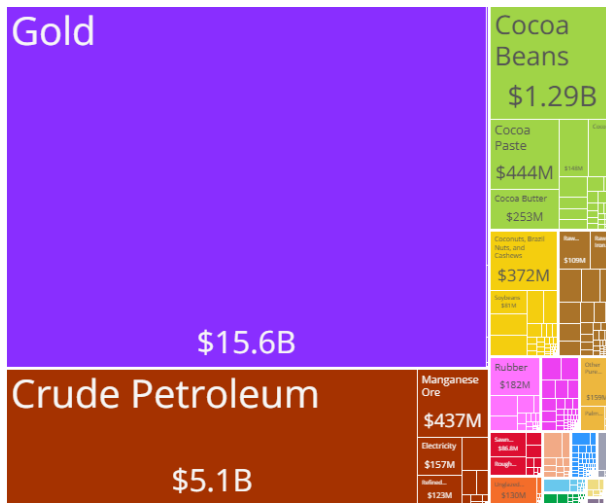


Figure 4. Economic Complexity by Products (1993-2023).

Source: The Observatory of Economic Complexity, 2025.

The post-colonial economy of Ghana has gone through four main phases:

1. **The First Republic (1960-1966):** Characterized by rapid industrialization, state-led development, and infrastructural investments. However, high debt accumulation, food shortages, and authoritarian governance led to the 1966 coup (Killick 2010; Osei-Hwedie, 1985).

2. **Instability and Decline (1966-1982):** This era saw frequent military interventions, macroeconomic instability, currency devaluations, and food shortages. Attempts at market-oriented reforms under Busia and Acheampong failed to deliver sustained growth (Osei-Hwedie, 1985; GhanaWeb, 2024)

3. **Economic Reforms and SAP (1983-1999):** Under Rawlings' PNDC and later the Fourth Republic, Ghana implemented IMF/World Bank reforms. These policies liberalized markets, privatized state enterprises, stabilized inflation, and promoted growth. However, they also exacerbated unemployment, rural poverty, and inequality (Boafo-Arthur, 1999; Konadu-Agyemang, 2000).

4. **Modern Economy (2000-date):** Ghana has achieved political stability and steady growth, driven by services, mining, and oil production. Despite attaining middle-income status in 2011, the country faces persistent challenges of graduate unemployment, inequality, debt dependency, and environmental degradation from activities such as Galamsey. (Aryeetey & Fenny, 2017; Graham et al., 2016; IMF, 2023; Osei-Assibey, 2014; Mubariq, 2017)

Conclusion

Ghana's post-colonial economy demonstrates both resilience and vulnerability. While reforms and resource discoveries have driven growth, structural weaknesses rooted in commodity dependence, weak industrial linkages, and recurring debt crises continue to challenge long-term development. The study confirms that sustainable development depends on a renewed commitment to strategic industrialization, human capital investment, and coherent policy execution supported by political will. Historical experience demonstrates that policy innovation alone cannot secure transformation without consistency in implementation and institutional accountability, which are predominantly contingent on political will.

The proposed Twenty-Four-Hour Economy Policy, if effectively operationalized, could enhance productivity, employment, and inclusive growth, representing a decisive shift from externally driven stabilization programs toward self-sustained economic resilience. Ultimately, Ghana's future prosperity rests on learning from its historical cycles of reform to pursue an integrated, diversified, and politically anchored development path.

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Advancing Artificial Intelligence in Africa: Bridging Infrastructure, Policy and Skills Gaps

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Abstract

In conclusion, Artificial Intelligence offers tremendous potential to drive sustainable development, economic growth, and social progress across Africa, but realizing this promise will depend on overcoming a range of complex, interrelated challenges. The continent's journey toward meaningful AI adoption is hampered by inadequate digital infrastructure, unreliable electricity, limited broadband access, fragmented and poor-quality data, and a lack of comprehensive data governance frameworks that safeguard privacy, security, and ethics. These technical barriers are compounded by a significant talent shortage, high costs of AI technologies, and the absence of robust policy and regulatory environments that can provide clarity and confidence for investors, innovators, and the public. Without deliberate efforts to ensure inclusivity, there is also the risk that AI could exacerbate existing socioeconomic inequalities and widen the digital divide between urban and rural areas or rich and poor populations. Moreover, public skepticism and low trust in AI, driven by misinformation and fears of job displacement, present further hurdles to its acceptance and integration. Yet, amid these challenges, encouraging signs of progress are emerging. Local initiatives and regional efforts are laying the groundwork for AI capacity-building, policy development, and practical

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applications tailored to Africa's unique needs, from agriculture and healthcare to financial inclusion. To truly unlock AI's transformative potential, coordinated action will be essential—combining investments in infrastructure, education, and research with the creation of inclusive regulatory frameworks and support for home-grown innovation. Only through such holistic and collaborative approaches can Africa harness AI as a force for equitable growth and sustainable development.

Keywords: AI, Challenges, Africa, Large Language Models, Efficiency

Introduction

Artificial Intelligence (AI) is playing an increasingly vital role in emerging human augmentation technologies that are streamlining business processes, including employee onboarding, financial advising, and personal assistance. AI is also being harnessed to replicate human decision-making in complex and dynamic environments, autonomous driving systems being a prime example. The rise of Industry 4.0 has heightened the urgency for nations to adopt advanced technologies like AI to remain competitive and resilient in a rapidly evolving global economy. Typically, the adoption of such technologies follows an S-curve pattern: starting slowly with innovators and early adopters, then accelerating as more stakeholders recognize the technology's value and transformative potential (Arakpogun et al., 2021).

While the potential benefits of artificial intelligence (AI) are undeniably transformative, realizing these gains requires a highly focused and strategic approach. AI should not be viewed as a universal solution to all business challenges. Instead, success depends on targeting specific, high-impact use cases that deliver measurable economic value in the near term. Despite its promise, AI is not a one-size-fits-all solution. Some early adopters have deployed AI technologies without thoroughly evaluating the precise challenges they aim to address or considering the nuances of local contexts. For example, a major telecommunications group introduced an AI-powered know-your-customer (KYC) solution for its mobile wallet business. However, the system initially produced low auto-approval rates due to its reliance on datasets developed primarily in Western markets. After refining the model with localized data, the company achieved significant performance improvements. This example underscores the importance of tailoring AI solutions to specific use cases and local conditions. Yet many organizations adopt AI without clearly defining their objectives or engaging business stakeholders throughout the deployment process. The full involvement of business leaders at each stage is essential to maximizing AI's value (Kiemde et al., 2020).

At an aggregate level, use cases within sales and marketing, as well as supply chain management, generate the most substantial returns. For instance, a leading consumer packaged goods company in Africa addressed forecasting inaccuracies caused by high demand volatility and stock-keeping unit (SKU) proliferation. By enhancing its statistical models with machine learning and external data sources –such as pricing, promotions, social media activity, and point-of-sale data– the company improved forecast accuracy by 4 to 20 percentiles and reduced inventory safety stock by more than 12 percent. Demonstrating tangible short-term impact is crucial for building the organizational conviction necessary to scale AI adoption across the enterprise (Amankwah-Amoah & Lu, 2024).

Most of the AI initiatives in Africa predominantly centre on revenue enhancement, with revenue management receiving two to three times more focus than cost optimization across all sectors. This contrasts with regions such as Europe, where nearly 70 percent of organizations priorities AI for improving efficiency and productivity. The emphasis on revenue in Africa likely reflects the region's early stage of AI maturity and limited opportunities for labour cost optimization. However, there is a strong divergence between the various countries that are at different development stages. As organizations grow more familiar with AI's capabilities, a shift toward cost management is expected. This evolution will also lead to greater differentiation in AI use cases by industry. For example, the agriculture and retail sectors are likely to emphasize supply chain optimization and procurement. Energy and public sector entities may focus more on backend functions such as HR and IT. Even within specific functions, the distribution of AI investments varies. In operations, many manufacturers' priorities robotics and automation, despite the potentially greater impact of AI-enabled predictive maintenance. This highlights the need for a comprehensive, business-oriented cost-benefit analysis and a well-defined implementation roadmap. Although certain sectors and functions may see more immediate benefits, AI has the capacity to create value across the entire business value chain. In general, more than 70 per cent of incremental AI value in Africa could be derived from just two areas: sales and marketing, and supply chain management (Gwagwa et al., 2020).

Within each function, select use cases offer particularly strong returns. AI adopters in the region have reported notable performance gains across the value chain. In sales and marketing, leading use cases include predictive upselling and cross-selling, customer lifecycle management, and tailored product recommendations. Machine learning-driven personalization can replace basic, rule-based

recommendation engines, significantly enhancing digital engagement, conversion rates, and revenue. Properly executed, AI can boost revenue by 21 to 30 percent. In supply chain management, inventory optimization is one of the most impactful applications. For example, there are several airlines that utilize machine learning to improve demand forecasting for capacity and sales planning, helping to reduce waste and increase efficiency. Unlike conventional spreadsheet-based models that rely solely on historical data, AI systems continuously integrate new information to enhance accuracy. This approach has the potential to reduce stock-outs by 21 to 30 percent (Chilunjika et al., n.d.).

Beyond these core areas, AI can also unlock value in other business functions. In human resources, it can enhance recruitment productivity, employee engagement, and retention, as shown by Pulsifi. In customer service, AI can improve satisfaction and efficiency, as illustrated by Parcel Platform. Given the value at stake, pursuing the wrong AI use cases can result in missed opportunities and wasted investments. Forward-looking organizations continuously evaluate and refine their AI strategies, ensuring that they remain aligned with their most pressing business challenges and deliver tangible, high-impact results.

Artificial Intelligence

While the benefits of artificial intelligence (AI) are becoming increasingly evident, its adoption across Africa remains uneven. Survey findings highlight five core challenges that are consistently cited across sectors. A common challenge is the mismatch between technical expertise and business domain knowledge. However, this concern may be overstated. Modern AI tools and pre-built models from major providers have significantly lowered technical barriers. The greater challenge lies in sourcing talent that understands both AI capabilities and real-world business problems, not just raw technical skills. Most of Africa's AI ecosystem is immature and fragmented. This lack of a cohesive network makes it difficult for organizations to access reliable and high-quality AI providers. As a result, experimentation with AI use cases is reduced, local vendor innovation is limited, and small and medium enterprises (SMEs) often struggle without sufficient ecosystem support (Oubibi et al., 2022).

Over half of businesses report issues with their data systems, including poor data quality, outdated or fragmented infrastructure, and inconsistent governance practices. These deficiencies create security and operational risks, slow down AI implementation, and hinder organizations from generating meaningful insights

from their data. Strengthening data governance and infrastructure is essential to enabling effective AI deployment.

Emerging regulations on privacy, data sharing, and AI model transparency, particularly in countries like Egypt, are becoming more restrictive. Regulatory fragmentation across Africa further complicates the landscape, impeding cross-border data flows and hindering the formation of cohesive regional AI strategies. Notably, 75% of survey respondents believe that harmonized regulations would significantly enhance AI investment and adoption. Employee resistance remains a significant hurdle. Many workers fear job displacement, whether through gradual automation or sudden technological shifts. About 33% of respondents cite employee pushback as a major barrier to AI adoption. This resistance often stems from a lack of communication around how AI can augment rather than replace jobs, as well as the absence of clear upskilling and reskilling pathways (Pantserev, 2022).

These challenges are substantial but not insurmountable. With coordinated efforts from businesses, governments, and educational institutions, Africa can address these issues directly and unlock the full potential of AI in the region. To fully harness the transformative power of artificial intelligence (AI), a comprehensive and coordinated improvement agenda is essential. Addressing the existing challenges requires collaborative efforts at both the organizational and national levels. Notably, several companies and governments have already begun to make progress in tackling these issues, offering valuable inspiration and guidance (Shafik, 2024).

The AI talent gap is frequently overstated. While there is indeed a shortage of data scientists, many AI solution providers now offer pre-configured, easy-to-deploy models that require minimal expertise. With appropriate training, graduates from science, technology, engineering, and mathematics (STEM) disciplines can transition into roles such as data preparation, visualization, and management. Upskilling existing staff and acquiring external talent for specific roles are both viable strategies to alleviate talent shortages. A noteworthy example is the AI national apprenticeship initiative, which facilitates career transitions into AI-related roles. The program includes nine months of classroom instruction, followed by practical, industry-based projects. Furthermore, a wide array of publicly accessible training programs is now available, enabling individuals to improve their AI literacy. Interestingly, many organizations report that a lack of business or domain knowledge presents a greater barrier than technical skills. AI leaders are responding by fostering collaboration through immersion sessions where business and technical teams co-create new use cases. DBS Bank, for instance, partnered with AWS Deep

Racer League to educate 3,000 employees about AI and machine learning, helping the company identify and implement innovative use cases (Eke et al., 2023).

Rather than competing for a limited pool of highly technical AI specialists, organizations should consider investing in the development of existing staff. These employees bring valuable domain expertise that, when combined with technical skills, can accelerate AI adoption. In addition, partnerships with technology providers enable organizations to deploy AI solutions more efficiently, reducing reliance on niche technical skills. Consequently, the talent gap, though widely perceived as a significant obstacle, is becoming less of a barrier to effective AI integration.

Africa's AI vendor landscape remains fragmented and underdeveloped, making it challenging for businesses to identify suitable providers. Compounding this issue is the inexperience of many potential users, who prefer tried-and-tested solutions. This results in a stalemate, especially in areas where use cases are still emerging or tailored to local contexts. Large enterprises, though better equipped to address these issues internally, often default to working with large vendors due to procurement limitations. Small and medium-sized enterprises (SMEs), however, lack such resources and face greater constraints. Government-supported testbeds can serve as a crucial solution. These environments enable iterative model testing using real-world data, promote AI use case development, and provide SMEs with access to the AI ecosystem without requiring significant initial investment. Moreover, testbeds help illuminate AI's societal impacts and support data-driven policy development (Hassan, 2023).

Effective testbeds must go beyond showcasing technology; they must support the development of scalable, real-world solutions. Analysis of successful initiatives, such as Dublin's Smart Docklands, Masdar City, the UK's NHS, China's manufacturing quality programs, and US water security systems, reveals five key success factors:

- Real commitment through dedicated resources, funding, and regulatory flexibility,
- Results-orientation, focusing on tangible business outcomes,
- Multi-stakeholder engagement, involving public and private sectors, academia, and civil society,
- Scalable implementation, expanding from pilot sandboxes to public deployments,
- Regulatory experimentation, allowing rules and practices to evolve in controlled settings.

A prime example is the focus on testbeds for autonomous vehicle development, which integrates these principles effectively. Approximately 80 per cent of AI implementation effort is spent on data processing. Thus, having the right data structure and governance in place is critical. Data collection remains a time-intensive task, and organizations should focus on gathering only data that directly supports business goals. Rather than approaching data infrastructure projects as traditional, multiyear IT initiatives, a dual-speed strategy is advisable. This entails balancing urgent business needs with long-term infrastructure development. Security, legal, and regulatory considerations should be embedded into data strategies from the outset. Initiatives such as AWS's Registry of Open Data and SageMaker Ground Truth highlight how organizations can streamline data acquisition and labelling efforts (Gikunda, 2024).

Regulatory frameworks must evolve alongside AI advancements. Regulators, while rightly concerned with issues such as data privacy and security, must adopt a forward-looking perspective to support innovation. A risk-based governance approach –tailored to the context and impact of AI use cases– is critical. Overregulation of low-risk applications can stifle progress, while under regulation of impactful technologies can lead to real-world harm. Testbeds again play an important role here, allowing policymakers to observe and experiment with regulatory boundaries in safe environments. Several countries have already begun formulating national AI strategies that integrate regulatory evolution with ecosystem development. These strategies are informed by input from the private sector to ensure pragmatic and effective policymaking. Cross-border data flow is another critical area. Data localization requirements hinder AI development by restricting access to distributed datasets and the computing power needed for advanced analytics. Federated learning offers a solution, enabling decentralized training of AI models without transferring sensitive data (as demonstrated in federated learning case studies).

AI Challenges

While AI is expected to transform the workforce, the impact will be gradual. AI will primarily augment rather than replace jobs, enhancing productivity and enabling more data-informed decisions. It will also create new roles such as AI developers, data translators, and governance specialists, skills that are currently scarce in Africa. To remain competitive, both policymakers and business leaders must invest in reskilling and upskilling initiatives. Programs like the United Kingdom's

National Retraining Scheme are preparing workers for the future through a blend of online and in-person training. Companies can also leverage platforms such as Coursera and Udemy to improve AI awareness among employees.

However, short-term training alone is not sufficient. Long-term reforms to education systems are imperative. Realizing AI's full potential will require a diverse talent pipeline capable of researching, developing, deploying, and overseeing AI technologies. This calls for comprehensive enhancements to STEM education and broader curricula.

Governments across the region are already taking steps to promote STEM. The STEM4All initiative, for example, seeks to broaden access and stimulate interest in science and technology, evolving towards STREAM (Science, Technology, Reading, Engineering, Arts, and Mathematics). In Vietnam, vocational and technical training programs are expanding career pathways outside of traditional higher education. One persistent challenge is language. Many AI platforms and codebases remain English-centric, limiting accessibility for otherwise skilled professionals in countries like Thailand and Vietnam. Addressing such barriers is key to inclusive AI development (Onyejebu, 2023).

While reskilling initiatives are important, systemic education reform remains the cornerstone of preparing future generations for a world increasingly shaped by AI.

Realizing the full potential of artificial intelligence (AI) requires a coordinated effort from all stakeholders—governments, businesses, technology providers, investors, and academia. While national AI strategies and skill-building programs offer a strong foundation, sustained momentum is essential. Each stakeholder must align their efforts toward delivering tangible business and societal impact. Governments play a pivotal role in driving AI adoption by formulating national AI strategies that prioritize key sectors. By taking the lead in deploying AI across public services, governments can optimize resource allocation, enhance operational efficiency, and create a robust ecosystem that supports broader economic integration of AI.

Moreover, governments must initiate long-term reforms in education to prepare a future-ready workforce. Addressing the talent gap and reskilling low-skilled workers, especially those most susceptible to job displacement, requires an adaptive education system. This includes fostering skills that are aligned with high-value activities and promoting lifelong learning.

Expanding the use of AI testbeds is another critical government responsibility. These controlled environments allow for the safe experimentation and development of AI applications. Governments should collaborate with regulators,

technology providers, and business users to ensure these testbeds are effective and widely adopted across sectors, thereby mitigating risk while encouraging innovation. For businesses, the key to successful AI adoption lies in focusing on initiatives that deliver measurable, near-term business outcomes. By prioritizing use cases that address immediate operational challenges, organizations can build early momentum and secure internal support for scaling AI solutions (Nandutu et al., 2023).

Implementing AI at scale also requires structural and cultural transformation. Businesses must establish agile operating models, integrate AI models into broader automated workflows, and develop mechanisms such as closed-loop testbeds for continuous improvement. These changes are crucial to institutionalizing AI as part of the organization's operating fabric. Equally important is the urgent need to address data infrastructure and governance challenges. Rather than pursuing incremental legacy system overhauls, companies should adopt bold, use-case-driven strategies that deliver quick wins and build a strong foundation for long-term AI development.

A human-centered approach to AI is also essential. Businesses should focus on augmenting the skills of their current workforce, rather than exclusively seeking new talent. By reskilling employees and involving them in solving real business problems, companies can facilitate smoother adoption and foster organizational buy-in.

Technology providers must shift their focus from developing theoretical breakthroughs to delivering AI solutions that offer clear, immediate value. A business model-centric approach ensures that AI deployments are aligned with customer needs and have a higher likelihood of commercial success (Otaigbe, 2022).

Additionally, providers should reassess their delivery models. Close collaboration with both business and IT functions is vital to achieving the desired impact. A balanced mix of on-site and off-site engagement, supported by strong local partnerships, is critical to delivering context-sensitive solutions and scaling AI across diverse markets.

Investors have a significant role to play in accelerating AI adoption across sectors and regions. By expanding their investment horizons to include emerging AI use cases and underrepresented markets, they can unlock substantial untapped value.

Beyond financial capital, investors should adopt a more active role in enabling AI adoption within their portfolios. This includes leveraging their global networks to connect portfolio companies with leading AI hubs in regions such as China, India, and the United States. Such connections can spur knowledge sharing and stimulate local innovation in Africa.

Academic institutions must ensure their research efforts are aligned with industry and societal needs. Rather than limiting their focus to current AI applications, research agendas should anticipate and address emerging market and societal challenges.

Furthermore, curricula must evolve to meet industry requirements. The goal should not be to produce more data scientists alone, but rather to develop a workforce equipped with technical skills and a practical understanding of how AI can address real-world business problems. Industry-oriented programs can bridge this gap and produce versatile professionals capable of driving AI adoption.

Across all stakeholder groups, a common thread emerges: the imperative to focus on business and societal impact. The true value of AI lies not in the sophistication of the technology itself, but in its ability to solve meaningful problems and create value in the near term (Eke & Ogoh, 2022).

Given that AI adoption in Africa remains at an early stage, concerted and focused action can unlock immense potential. If implemented effectively, AI could contribute up to \$1 trillion to the region's GDP by 2030. To achieve this, governments, businesses, solution providers, investors, and academic institutions must work collaboratively, driven by a shared commitment to achieving impactful outcomes.

African AI Challenges

Artificial Intelligence (AI) is reshaping the global landscape, influencing industries, economies, and societies alike. Its applications span across fields such as healthcare, agriculture, and education, offering the promise of greater efficiency, innovation, and solutions to persistent challenges. For Africa – a continent abundant in cultural diversity, natural wealth, and human talent – AI holds immense potential. Yet, realizing these benefits requires overcoming significant obstacles that currently slow down adoption (Sey & Mudongo, 2021).

One of the most pressing challenges is the continent's underdeveloped digital infrastructure. Many regions still struggle with unstable electricity, costly or unreliable internet services, and limited broadband coverage. These shortcomings restrict the rollout and scaling of AI, which depends on consistent connectivity, advanced data processing, and access to cloud technologies. Another critical hurdle is the lack of sufficient, high-quality data. In many African countries, data is either scarce, fragmented, or unreliable, making it difficult to train robust AI systems. This problem is compounded by the absence of strong data governance frameworks, raising concerns around privacy, security, and ethical practices. Without comprehensive,

trustworthy, and contextually relevant datasets, creating AI solutions that effectively address Africa's unique challenges becomes an uphill task.

One of the primary obstacles to AI adoption in Africa is the region's underdeveloped digital infrastructure. Many communities continue to face unreliable electricity, slow or costly internet access, and limited broadband coverage. These deficiencies hinder the deployment, operation, and scaling of AI technologies, which depend on stable connectivity, extensive data processing, and cloud computing resources. Another critical challenge is the scarcity and quality of data required to train and optimize AI systems. In numerous African countries, data is often fragmented, incomplete, or of low quality, making it difficult to develop effective AI models. The absence of robust data governance frameworks also raises concerns around privacy, security, and ethical use—essential components for building reliable and trustworthy AI solutions. The shortage of skilled professionals adds further complexity. Across the continent, there is a limited pool of AI specialists, data scientists, and machine learning engineers. While technology hubs in cities like Lagos, Nairobi, and Cape Town are actively cultivating talent, demand significantly outstrips supply. Many educational institutions face resource constraints that limit their ability to provide advanced AI and data science training. Cost is another significant barrier. Implementing AI requires substantial investment in hardware, software, cloud services, and skilled personnel. For numerous African businesses and government agencies, tight budgets make AI initiatives difficult to prioritize, and dependence on imported technologies further drives up expenses. Lastly, gaps in policy and regulation impede progress. Effective AI adoption requires frameworks that provide clear guidance on ethics, accountability, data protection, and intellectual property. In many African nations, such regulatory structures are still nascent or absent, creating uncertainty for innovators and investors and slowing the pace of AI integration (Ooko et al., 2021).

One of the main obstacles to AI adoption in Africa is the region's underdeveloped digital infrastructure. Many communities face unreliable electricity, slow or costly internet, and limited broadband coverage, all of which hinder the deployment, operation, and scaling of AI technologies that depend on stable connectivity, large-scale data processing, and cloud computing access. This challenge is compounded by the scarcity of high-quality data needed to train and optimize AI systems. In many African countries, data is either unavailable, fragmented, or of poor quality, making it difficult to build effective AI models. The absence of robust data governance frameworks also raises concerns about privacy, security, and the

ethical use of information-critical factors for trustworthy AI solutions. Another key barrier is the shortage of skilled professionals, including AI specialists, data scientists, and machine learning engineers. While tech hubs in cities like Lagos, Nairobi, and Cape Town are fostering talent, demand far outpaces supply, and many educational institutions lack the resources to provide advanced AI and data science training. Financial constraints further impede adoption, as AI implementation requires significant investment in hardware, software, cloud services, and skilled personnel. For many African businesses and governments, budgets are tight, and reliance on imported technologies inflates costs. Policy and regulatory gaps also slow AI progress. Clear frameworks addressing ethics, accountability, data protection, and intellectual property are still developing in many countries, creating uncertainty for innovators and investors. Socioeconomic inequalities add another layer of complexity, as AI solutions must be inclusive to avoid widening divides between urban and rural areas or between wealthier and poorer communities. Ensuring that AI benefits all segments of society is therefore a critical challenge. Finally, low awareness and trust in AI – fueled by misinformation, fears of job loss, or skepticism about its relevance – can hinder adoption. Promoting transparency, public education, and local success stories will be essential to building confidence and driving meaningful AI integration across the continent (Wakunuma & Eke, 2024).

One of the key obstacles to AI adoption in Africa is the region's insufficient digital infrastructure. Many communities face persistent challenges, including unreliable electricity, slow or expensive internet access, and low broadband penetration. These limitations hinder the deployment, operation, and scaling of AI technologies, which rely on stable connectivity, large-scale data processing, and cloud computing resources. The problem is further compounded by the scarcity of high-quality data needed to train AI systems. In numerous African countries, data is often fragmented, incomplete, or unavailable, and the lack of strong data governance frameworks raises concerns around privacy, security, and ethical usage. Africa also faces a pronounced skills gap, with a shortage of AI specialists, data scientists, and machine learning engineers. While tech hubs in cities like Lagos, Nairobi, and Cape Town are fostering talent, the demand for skilled professionals far exceeds supply. Many educational institutions still lack the capacity to offer advanced training in AI and data science. Additionally, the high cost of AI solutions presents a major hurdle. Implementing these technologies requires significant investment in hardware, software, cloud services, and human capital, costs that are often exacerbated by reliance on imported technologies.

Policy and regulatory gaps further slow AI adoption. Many countries are still developing frameworks to guide ethics, accountability, data protection, and intellectual property, creating uncertainty for innovators and investors. Without deliberate efforts to ensure inclusivity, AI could deepen existing socioeconomic inequalities, widening the digital divide between urban and rural areas or between wealthy and poorer populations. Public awareness and trust in AI also remain limited; misinformation, fear of job displacement, and skepticism about AI's relevance can reduce acceptance and uptake of AI solutions. Despite these challenges, there are encouraging developments across the continent. Initiatives like Data Science Nigeria, AI Kenya, and Zindi Africa are building AI communities and offering training programs. The African Union is exploring a continental AI strategy. Practical AI applications are already emerging in agriculture –for pest detection and yield forecasting– in healthcare through diagnostic tools, and in financial services via credit scoring for unbanked populations. To fully realize AI's potential in Africa, investment in infrastructure –such as expanded broadband and reliable electricity– is essential. Strengthening education through robust STEM programs, online learning platforms, and AI research hubs will help address the skills gap. Developing clear policy and regulatory frameworks can balance innovation with privacy and ethics, while collaboration between governments, academia, the private sector, and civil society can foster more effective solutions. Finally, promoting locally developed AI technologies tailored to African contexts can ensure that AI benefits are inclusive and sustainable (Owoyemi et al., 2020).

Conclusion

Artificial Intelligence holds immense transformative potential for Africa's diverse economies and societies, but its widespread adoption is currently constrained by significant challenges that require coordinated and sustained efforts to overcome. The continent faces critical infrastructural shortcomings such as unreliable electricity and limited internet access, which hinder the deployment and scaling of AI technologies. Additionally, the scarcity of quality data and the absence of robust data governance frameworks raise concerns about the ethical, secure, and effective use of AI. Compounding these issues is a pronounced skills shortage, with demand for AI experts far outpacing supply, alongside high costs associated with AI implementation that many organizations find prohibitive. Policy and regulatory environments remain underdeveloped, creating uncertainty that can stifle innovation and investment. Socioeconomic disparities threaten to deepen if AI solutions are not inclusively designed, and public skepticism fueled by misinformation and fear poses further obstacles to acceptance. Nevertheless, promising initiatives across the continent –from grassroots training programs to regional AI strategies– demonstrate a growing commitment to harnessing AI's benefits. To truly unlock AI's potential in Africa, there must be strategic investment in digital infrastructure, education, and regulatory frameworks, coupled with collaborative efforts between governments, academia, industry, and civil society to develop localized, ethical, and accessible AI solutions that address the unique challenges and opportunities of the continent. Only through such integrated approaches can AI become a powerful tool for inclusive growth, innovation, and sustainable development across Africa.

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African Regionalism: Subregional Power Shifts and Their Impact on African Union Integration

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Abstract

This paper addresses the persistent gap between the African Union's (AU) ambitious goal of deep regional integration and its limited progress. While much scholarship attributes this stagnation to institutional weaknesses, structural constraints, and cultural heterogeneity, often in comparison with the European Union, this study identifies a neglected dimension: the impact of subregional power shifts on continental integration. This approach is novel because existing studies of AU integration overwhelmingly priorities institutional design, normative frameworks, or overlapping membership problems, while paying insufficient attention to how subregional power shifts structurally constrain wider continental cohesion. Using a neorealist framework, particularly Waltz's (1979) balance of power and Mearsheimer's (2014) offensive realism, it argues that instability within the AU's eight Regional Economic Communities (RECs) undermines cohesion at the continental level. The analysis draws on updated 2024 GDP per capita and military expenditure data from the World Bank (2024) and Stockholm International Peace Research Institute (2024), alongside alliance patterns within four politically and economically significant RECs: the Arab Maghreb Union, East African Community, Southern African Development Community, and Economic Community of West African States. Findings show that recurring rivalries within these four major regional blocs generate multipolar instability at the subregional level, which then spills over into AU decision-making.

Keywords: Regionalism, Regional Order, Neorealism, African Union, Balance of Power

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Introduction

The African Union (AU) was set with an ambitious goal of integration to the extent of a potential “*United States of Africa*.” Despite numerous attempts to realize this goal, the AU has remained an intergovernmental organization of a largely ceremonial and symbolic nature, thus falling short of any supranational status. One reason for the persistence of the status quo is thought to be a reluctance or even unwillingness of the AU member states to pool their national sovereignties in a continental organization with effective executive, legislative, and judicial rights (Hartmann, 2020). The reluctance or unwillingness of AU member states is often the bedrock explanation that scholars immediately turn to in an attempt to explain the stagnated integration of the AU. There is a liberal perspective bias in many African scholarly works, and this is portrayed in the tendency to compare the African Union to the European Union (Welz, 2012). This limits the scope of explanations to structural and institutional lenses. As noted by Acharya (2012), “beyond formal institutions, regional orders can be based more or less around shared norms.” Constructivism sheds light on ideational aspects of regional integration and how they impact the outcomes of goals and objectives set by regional organizations. Liberal and Constructivist perspectives have provided explanations to the stagnation of the African Union which, on one hand have aided in the development of real time policy prescriptions, and on the other hand have redirected the focal point from the true nature of the international system and its power dynamics that cannot be ignored.

African regionalism is quite unique from its counterparts in that it is made up of subregions within the wider region which adds layers to the context of integration. The Abuja Treaty of 1991 established the African Economic Community (AEC) and set the eight African subregional organizations as the pillars to realize the goal of an integrated Africa with an economic and monetary union (African Union Commission et al., 2019; Bach, 2016). This basically means that in order for regional integration to be realized, subregional integration must be realized first. The eight subregional organizations include the Arab Maghreb Union (AMU), the East African Community (EAC), the Southern African Development Community (SADC), the Economic Community of West African States (ECOWAS), Community of Sahel-Saharan States (CEN-SAD), Common Market for Eastern and Southern Africa (COMESA), Economic Community for Central African States (ECCAS), and Intergovernmental Authority on Development (IGAD). This paper will focus on four major subregional organizations i.e., the AMU, EAC, SADC and ECOWAS, as these are not only economic intergovernmental organizations,

but also possess political association provisions in addition to Regional Economic Community (REC) status. In attempts to explain the AU's stagnated integration, scholars often include the subregional context by highlighting the overlapping memberships of various African states to two or more subregions, an issue widely discussed in African regionalism scholarship (Bach, 2016). Take the example of the Democratic Republic of Congo for instance, who is part of SADC, EC-CAS and recently joined the EAC. Membership overlaps signal split loyalties, and above all split interests, and expose the degree to which power dynamics, transactionalism and instrumentalism are at play within the subregional context of African regionalism. Although African regionalism has generated a substantial body of scholarship, much of this literature remains based on institutional, normative, or legalist analyses. Foundational contributions highlight the legacies of colonial boundaries, the challenges of sovereignty, and the continent's complex variety of identities and political traditions (Ndlovu-Gatsheni, 2013; Clapham, 1996; Bach, 2016). While these works illuminate important structural constraints, they often underplay the continuing relevance of material power asymmetries and competitive state behavior. Studies focusing on institutional inadequacies or overlapping REC memberships tend to treat these dynamics as coordination failures rather than as outcomes of deeper strategic rivalries among states.

At the same time, more recent scholarship on African regionalism has emphasized normative transformation, continental identity, and the role of the AU in peace and security governance (Murithi, 2008; Langan, 2018; Welz, 2012). These perspectives offer valuable insights into agenda-setting and institution-building but frequently assume that states share a baseline commitment to collective goals. What is comparatively understudied is how shifts in relative power, both economic and military, shape the incentives of subregional actors and in turn influence regional outcomes. By foregrounding balance-of-power dynamics, this study contributes to filling this gap and complements existing literature by examining how material capabilities and strategic alignments condition the AU's prospects for deeper integration. The first part of the paper demonstrates how realist perspectives, and more specifically neorealism, offer an alternative explanation to the lagging integrative process of the African Union. The second part will provide examples of the power shifts at play within each subregional organization. Next, the impact of the shifts in balance of power in the subregions on the integration of the wider region is demonstrated. In conclusion, a possible solution to the issue of stagnated integration in the African Union is offered.

Realism in Regional Orders

The ambiguity of the international system has given rise to various debates about its exact nature and how its main actors interact and perceive each other. Contemporary theories have emphasized approaches different from the classical rhetoric of power dynamics by citing that state interaction is beyond just power and interest. Illuminating the layers present in the ambiguous nature of international politics, although useful in bringing clarity to the “black box,” does not supersede the overarching nature of power and what it stands for in global politics. Classical realism emphasizes the true nature of states as being dependent on their capabilities and power to further their interests for survival. This Darwinian approach is often criticized as being one dimensional, and although that is true, many scholars cannot offer theories that minimize the effect of power relations in the international system.

Realist perspectives are based on the ‘anarchic’ nature of the international system which creates this “survival of the fittest” atmosphere in the absence of a central authority that dictates and regulates. Herein lies the point of contention: how can realism be applied to regionalism when its basic assumption is anarchism? According to Copeland (2012), “to build a workable realist theory of regional conflicts that can apply across time and space, we must assume that regional actors look only to the impact of extra-systemic great powers on their local power levels and trends, and not to commitments by such powers to insert their own forces into the region from the outside.” This implies that for realist theory to apply within regional orders, the impact of extra-regional actors must be held as indirectly rather than directly interfering in internal regional affairs. With this in mind, which realist theory then applies in the African regional context? Neorealist perspectives of international political theory offer an explanation of balance of power which adds a dimension of methodological validity that classical realist theory lacks. Kenneth Waltz asserts that “because of the ‘self-help’ nature of the system, states do not have a world government to resort to in a situation of danger, but they can only try to increase their capabilities relative to one another through either internal efforts of self-strengthening, or external efforts of alignment and realignment with other states” (Waltz, 1979). In the post-colonial era, African states needed to engage in effective nation-building strategies following independence from great powers, and this meant engaging in internal and external balancing, as described by Waltz, for development and ultimately for survival. Offensive realism, pioneered by John Mearsheimer, “describes states as power maximizers that maximize their relative

power aiming at regional hegemony” (Mearsheimer, 2014). This is an important description of power dynamics as it points out the ultimate goal of power-seeking states. It also outlines the degrees of stability in relation to power polarity in the system: the more unipolar, the more stable the system tends to be. According to this strand of hegemonic stability theory, multipolarity enables instability as powers contend to promote their own interests.

The neorealist balance of power theory offers a strong explanation of power dynamics in an anarchic system. Within the regional context, one must assume that the role of extra-regional powers comes in as one that further influences the external balancing element of the balance of power, and thus only indirectly affects outcomes of decisions made within regional affairs. This can be observed in the Anglo-Francophone divide in West Africa, where post-colonial ties with either Britain or France indirectly influence states’ foreign policy orientations. All this then brings us to a more pressing question: how exactly does balance of power impact regional integration? It is not the balance of power as such, but rather the shifts in balance of power that destabilize integrationist incentives. Brigitte Weiffen describes “power shifts” as one of the major stress factors that impact regionalism and can bring either negative (disintegration) or positive (resilience) outcomes (Nolte & Weiffen, 2020). The European Union remained resilient through the rise and fall of the bipolar international system, but the same cannot be said in the African region. Power shifts have been present mainly in the subregional context of African regionalism in the form of state-state rivalry and have caused spill-over effects into the wider regional context. Multipolarity may have strengthened the EU, but the same cannot be said for the African Union experience.

Materials and Methods

This study adopts a qualitative comparative approach grounded in neorealist theory, focusing on balance of power dynamics and hegemonic stability concepts (Waltz, 1979; Mearsheimer, 2014). Neorealism is chosen for its explanatory power in contexts where state behavior is heavily influenced by competition for relative gains rather than absolute gains, which is central to understanding AU member state interactions. The study uses secondary data from the African Union Commission et al. (2019) to assess integration performance, the Stockholm International Peace Research Institute (SIPRI, 2024) for military expenditure as a proxy for security capability, and World Bank’s (2024) national account for GDP per capita to capture economic strength. Alliance patterns are derived from

documented diplomatic and security alignments within and across RECs. These indicators i.e., economic capability, military capability, and alliance behaviors, are widely recognized in international relations scholarship as robust measures of state power (Waltz, 1979; Acharya, 2012). Although this study employs quantitative indicators such as GDP per capita and military expenditure, the analytical approach remains qualitative. The indicators are not used for statistical modelling but rather for interpretive comparison, allowing the identification of patterns of internal and external balancing across cases. The analysis is therefore qualitative in the sense that it relies on theory-guided interpretation of secondary data, diplomatic alignments, and historical trajectories to explain how shifts in power affect integration outcomes. This aligns with established qualitative comparative methods, where numerical data serve as empirical anchors for conceptual assessment rather than for econometric inference.

State- State Rivalry in African Subregions

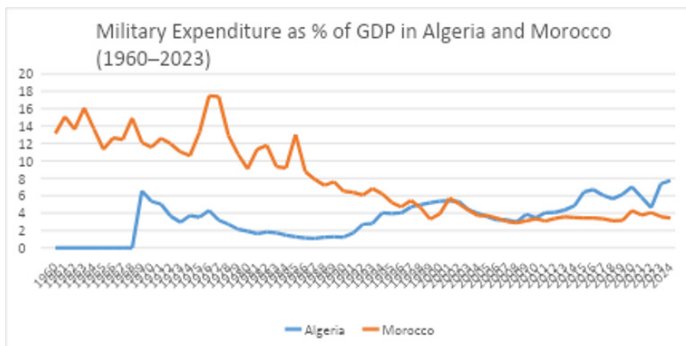
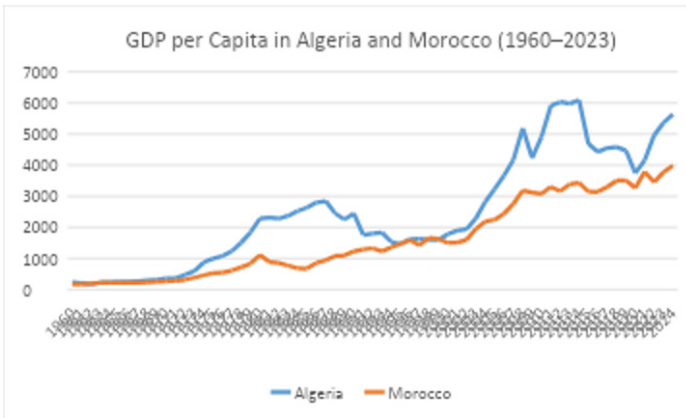
There have been numerous stress factors that have affected each subregion of Africa and have functioned as points of contention between member states, resulting in subregional rivalries that shape the outcome of subregional integration. The African Union cites the subregional organizations as the pillars of integration, implying that the goal of integration in the wider organization depends on how firmly each subregion can achieve integration before the African Union achieves the same objective. The strategy here is simple: an approach of achieving integration through smaller levels and phases, a gradual process that potentially addresses the heterogeneity of the African region and hopefully pools subregions toward a common goal. From a liberal perspective, this strategy is logical, as liberals view “cooperation” as the ultimate goal of actors in the international system. This is all good and well, but as noted above, such approaches overlook the overarching dynamics of power and interest. With this in mind, one can see how ambitious an objective the AU set for itself and how placing this objective in the hands of the subregional RECs added an additional layer of difficulty.

In this section, showing the balance of power shifts at play within each subregion helps illuminate the extent to which they have impacted the integrationist prospects of the wider regional organization. To portray internal balancing, comparative graphs of GDP per capita and military expenditure as a percentage of GDP among rival states within each subregion are used. External balancing is shown through the alliances formed by rival states.

The Arab Maghreb Union (AMU)

The North African subregional organization, the Arab Maghreb Union, was founded in 1989 and was largely initiated by Morocco and Tunisia. Its member states include Morocco, Algeria, Tunisia, Libya, and Mauritania. It is important to note that Egypt is not a member of the AMU, though it is a member of CEN-SAD. “The government in Cairo did apply for, but was refused, membership in 1994” (Møller, 2009).

The AMU is known as the least active of all subregional organizations, as the crisis surrounding the Western Sahara question has exposed deep rivalry between two of the largest states in the subregion: Algeria and Morocco. “As these two countries are each other’s archenemies, it is small wonder that the AMU is extremely weak, bordering on complete insignificance” (Møller, 2009). Tunisia is seen as a Moroccan ally because it has refused to recognize the Sahrawi Arab Democratic Republic (SADR), while Libya and Mauritania have recognized it alongside Algeria. These split alliances reflect the external balancing dynamics between the two rival states. The following charts show the GDP per capita and the military expenditure as % share of GDP for Algeria and Morocco from 1960 to 2023.



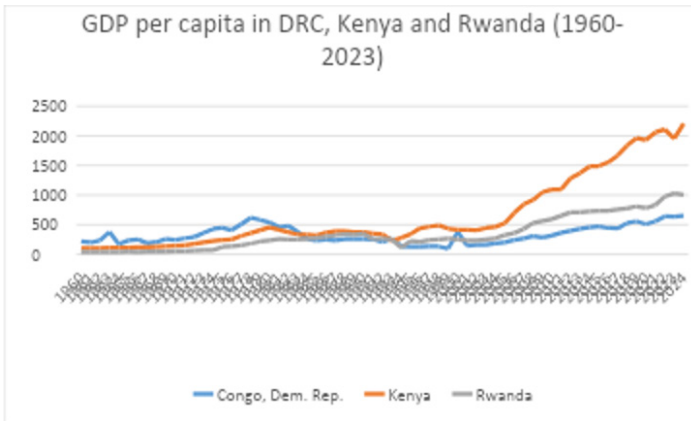
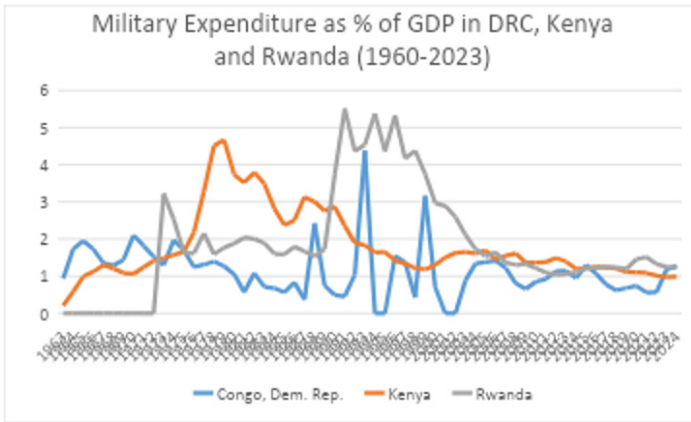
The Algeria-Morocco evidence points to a sustained rivalry that constrains cooperation within the AMU. Internal balancing refers to the ways in which states build capabilities at home through economic growth, fiscal resources, and military effort. Morocco's steadier rise in GDP per capita suggests a broader and more diversified base of state capacity, whereas Algeria's per-capita income moves with hydrocarbon cycles that finance punctuated increases in military spending. External balancing captures how states seek to strengthen their position through partnerships, procurement channels, and diplomatic backing. Morocco's deepening ties with the United States, the European Union, and Gulf partners, and Algeria's enduring links to Russia alongside attempts at diversification, reduce the costs of readiness while reinforcing opposing alignments around Western Sahara.

Taken together, these internal and external moves generate competitive parity with alternating advantages rather than an accepted subregional leader, which leaves the AMU operating in a fragile multipolar setting. Under such conditions, integration initiatives carry high audience and sovereignty costs and are easily interpreted as concessions on core status questions. The resulting institutional paralysis therefore follows from the logic of rivalry, reinforced by internal and external balancing and sustained by the unresolved Western Sahara dispute, rather than from an institutional design alone.

The East African Community (EAC)

Founded in 1967, four years after the OAU, the EAC's three founders i.e., Kenya, Tanzania, and Uganda, were partners that gradually became rivals. The organization collapsed in 1977 after disputes over representation and security, with Kenya seeking greater institutional weight, Uganda pressing Tanzania over opposition sanctuaries, and Tanzania and Kenya aligning against Idi Amin. The EAC was re-established in 2000 and later enlarged to include Rwanda and Burundi in 2007, South Sudan in 2016, and the Democratic Republic of Congo (DRC) in 2022. In 2024 the EAC also admitted Somalia, extending the bloc's coastline and security perimeter while adding another fragile member to an already complex landscape. Enlargement has made existing rivalries more visible because conflict dynamics in the eastern DRC involve cross-border mobilization and the active interests of Rwanda and Uganda, with Burundi also implicated in the security spillovers. As a result, the DRC has often found itself isolated within EAC deliberations on security, while Kenya and Tanzania continue competing over trade corridors, port access, and standards regimes that shape the region's economic center of gravity. These patterns reflect internal balancing

through growth, fiscal capacity, and military effort, and external balancing through shifting partnerships with extra-regional actors and security providers. The comparative trajectories of GDP per capita and military expenditure for Kenya, Rwanda, and the DRC, presented in the charts below, show how these rivalries map onto material capabilities and help account for uneven integration outcomes within the EAC.



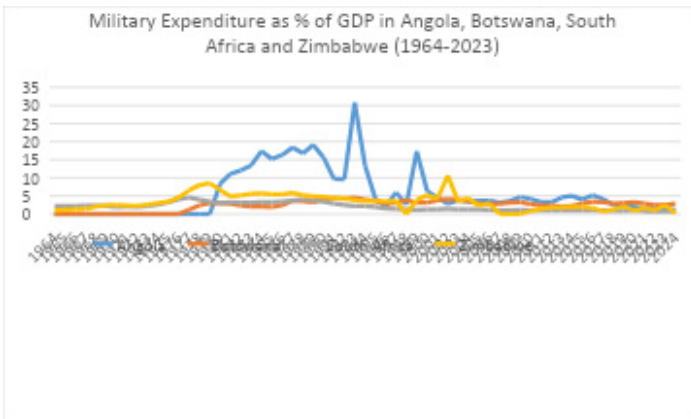
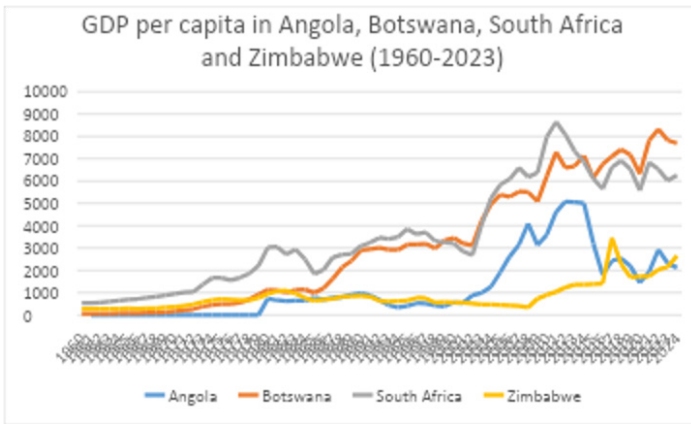
The EAC time series point to a rivalry structure in which both internal and external balancing shape uneven integration outcomes, and in which the balance of power has shifted in two clear phases. In the first phase, during the original EAC, Kenya acted as the central subregional power and was rivalled primarily by Uganda and Tanzania. In the second phase, after the EAC was re-established in 2000, Rwanda's rise altered the subregional center of gravity, and Kenya and Rwanda developed a close alignment in economic and security affairs, particularly around corridor competition and positions linked to the eastern DRC. Kenya's GDP per capita rises

steadily from the mid-1990s and accelerates after 2003 with reforms, the expansion of services, and large infrastructure, while Rwanda's income collapses in 1994 and then increases robustly with post-genocide reconstruction and institutional consolidation. The DRC's trajectory remains volatile because of the Congo wars, recurrent violence in the East, and weak fiscal capacity, which leaves a wide gap by the time of its EAC accession in 2022; Somalia's admission in 2024 adds another layer of security complexity. Military expenditure as a share of GDP follows perceived threats, with Rwanda's burden rising in the late 1990s and 2000s and then easing as internal security consolidates, Kenya maintaining a moderate but capable posture with modest increases around the 2011 intervention in Somalia and subsequent counter-terrorism demands, and the DRC showing erratic ratios constrained by a narrow tax base and reliance on external support. Overlapping memberships reinforce this multipolar setting: Ethiopia, which is one of the AU's most influential states, sits outside the EAC within IGAD, while both Kenya and Uganda straddle the EAC-IGAD divide. These cross-cutting commitments, which are common across Africa's RECs, complicate coalition patterns and raise the costs of credible coordination. As a result, Rwanda and Uganda remain deeply involved across the border, Kenya and Tanzania continue to compete over corridors and standards, and the DRC is often isolated within EAC security deliberations. Under these conditions, EAC institutions struggle to pool high-salience security issues because cooperation can be read as a concession on sovereignty, whereas economic measures that limit issue linkage move more readily. This configuration supports the argument that subregional power shifts and rivalry, expressed through internal and external balancing and reinforced by overlapping RECs, spill over to stall deeper regional integration.

The Southern African Development Community (SADC)

The apartheid regime in South Africa posed a persistent threat to neighboring states, and several sought external protections during the early twentieth century. This threat encouraged subregional cooperation, and the newly independent states of the region, led by Zambia and Zimbabwe, formed the Front-Line States in 1980 with the objective of ending apartheid and supporting liberation movements. The fall of the apartheid regime in 1994 coincided with the end of the Cold War, which had affected Southern Africa more than most other regions, and helped to shift the focus from liberation to regional security cooperation and economic coordination. SADC was established in 1992, building on and eventually replacing the Front-Line States, and today includes Angola, Botswana, Comoros, the Democratic Republic of

Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, the United Republic of Tanzania, Zambia, and Zimbabwe. South Africa is widely viewed by extra-regional actors as the putative subregional hegemon, although actual hegemony has been constrained by the presence of rivals with comparable strength in specific dimensions, especially Angola in hard power and Zimbabwe in political-military networks, and by the lingering distrust of South Africa's perceived economic dominance. These rivalries have been visible in the handling of the Namibian transition in 1990, in the interventions surrounding the DRC crises since the late 1990s and mid-2000s, and more recently in competing approaches to security and mediation within the Great Lakes. South Africa has often found support from Botswana and Namibia, while Zimbabwe and Angola have coordinated on key security questions, including their positions toward Kinshasa. Against this background, the comparative trends in GDP per capita and military expenditure among South Africa, Angola, Zimbabwe, and Botswana help to illustrate how internal and external balancing has shaped SADC's pattern of cooperation and contention.

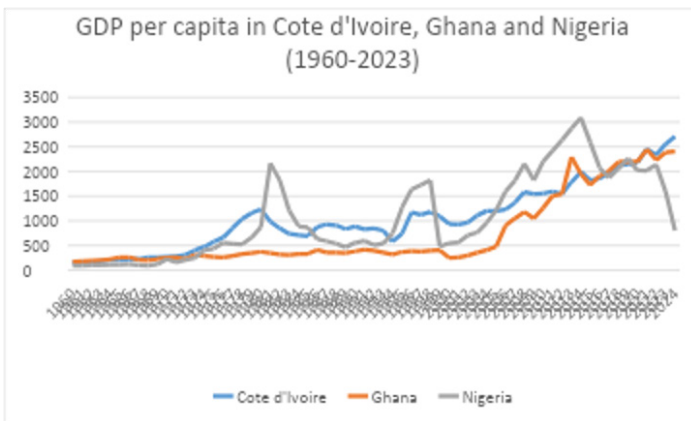
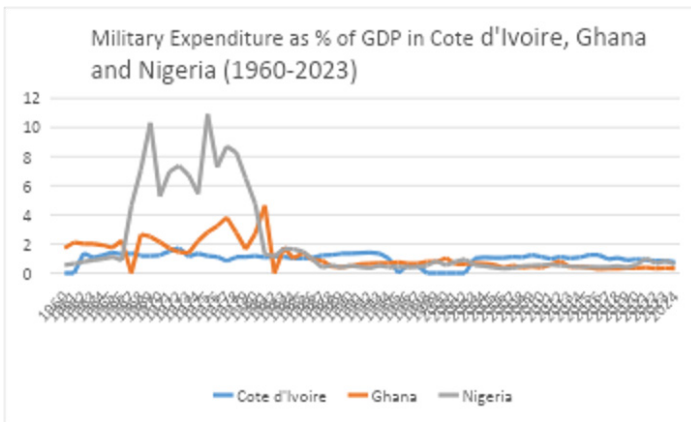


The SADC series begin in 1964 because consistent GDP and defense data for the four comparators are available from that point, which captures the late colonial period, the liberation era, and the post-apartheid transition. The GDP per capita paths indicate that South Africa and Botswana consolidate the largest and most stable income bases in the subregion, while Angola and Zimbabwe show sharper swings that are linked to oil cycles and prolonged political-economic crises. The military-expenditure shares show a different hierarchy: Angola's defense burden rises with wartime mobilization and oil-financed procurement during and after the civil war, which sustains a hard-power profile that is higher than its income path would suggest; South Africa's share declines through the democratic transition and stabilizes at lower levels consistent with a strategy that relies on a diversified economy and technological edge rather than sustained high defense ratios; Botswana maintains a modest but steady burden, which supports professionalization and close cooperation with South Africa; Zimbabwe's burden spikes around the intervention in the DRC in the late 1990s and then falls as fiscal collapse constrains capacity. From a neorealist point of view, these patterns show internal balancing along different dimensions, with Angola maximizing coercive capability through resource rents and South Africa maximizing influence through economic preponderance and selective modernization. External balancing remains visible in the alignment patterns observed around Kinshasa, where Angola and Zimbabwe have coordinated positions and South Africa has often moved with Botswana and Namibia. The net effect is competitive parity across economic and military dimensions without an accepted hegemon, which helps explain why SADC's security cooperation advances episodically and why integration relies on issue areas that minimize sovereignty costs, while high-salience security questions are managed through ad hoc coalitions outside formal SADC mechanisms.

The Economic Community of West African States (ECOWAS)

Established in 1975, ECOWAS brought former British and French West African territories into a single framework for economic and political cooperation, yet the Anglophone–Francophone cleavage persisted through parallel monetary arrangements: UEMOA among mostly Francophone members using the CFA franc and the West African Monetary Zone among primarily Anglophone states. Today the bloc comprises Benin, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Nigeria, Senegal, Sierra Leone, and Togo, while Burkina Faso, Mali, and Niger formally left in January 2025 and now coordinate

through the Alliance of Sahel States. ECOWAS acknowledged the withdrawals and introduced transitional measures that maintained recognition of travel documents and some free-movement provisions during a grace period, which demonstrated how security realignments and overlapping monetary regimes complicate efforts to pool sovereignty. Within this context, Nigeria remains the material anchor of the region, Ghana continues to exercise outsized institutional influence in WAMZ and ECOWAS arenas, and Côte d'Ivoire serves as the UEMOA pole, so rivalry and coalition building often pivot around these three states even as Sahelian exits reshape the broader security perimeter. The charts that follow compare GDP per capita and military expenditure for Nigeria, Ghana, and Côte d'Ivoire to illustrate how internal balancing through growth and fiscal effort, together with external balancing through monetary and security alignments, structures competition and conditions integration outcomes in West Africa.



The ECOWAS series show a rivalry structure in which Nigeria anchors the material hierarchy but does not convert that weight into uncontested hegemony, while Côte d'Ivoire and Ghana shape coalition politics through economic performance and institutional influence. Nigeria's GDP per capita improves unevenly with oil-price cycles and domestic shocks, and its military burden remains moderate, which fits a strategy that relies on scale and episodic security projection but is constrained by fiscal volatility and internal demands. Côte d'Ivoire's income path converges after the mid-2010s as post-crisis recovery, export diversification, and infrastructure investment raise capacity, and its defense effort stays low but steady, consistent with a growth-first internal balancing strategy backed by UEMOA's monetary anchor and French security ties. Ghana's trajectory reflects democratic consolidation and macro reforms that lift income from the mid-2000s, punctuated by adjustment episodes, while defense outlays remain contained to preserve fiscal space and diplomatic flexibility. These patterns help explain why alliance behavior has periodically shifted away from automatic deference to Nigeria and toward coalitions centered on Côte d'Ivoire, with Ghana acting as a pivotal player within ECOWAS itself. The Sahelian exits deepen this dynamic by shifting security salience northward and reducing the leverage that sanctions and collective defense once provided, which leaves monetary alignments (UEMOA vs. WAMZ) and corridor competition as the principal venues for external balancing. In this setting, internal balancing through growth and fiscal capacity rather than sustained high defense ratios provides the most credible foundation for regional influence, and it helps account for the stop-start character of integration as states trade off market access against concerns about asymmetry and sovereignty.

To synthesize the empirical patterns discussed across the four subregions, Table 1 below summarizes the comparative power configurations shaping the dynamics of African regionalism. Drawing on updated 2024 economic and military indicators alongside documented alliance behaviors, the table consolidates how internal and external balancing interact within each REC.

Regional Economic Community	Dominant Rivalries & Alignments	Relative Economic Capability (GDP per Capita, 2024)*	Relative Military Capability (Military Expenditure, % GDP, 2024)*	Effects on Regional Integration
Arab Maghreb Union (AMU)	Algeria vs. Morocco; Tunisia generally aligns with Morocco; Libya & Mauritania recognise SADR, supporting Algeria's position	Algeria leads modestly (5,722), Morocco slightly lower (~4,200), Tunisia mid-range, Mauritania & Libya lag	Algeria highest (6.1%), Morocco moderate (4.1%), Tunisia & Mauritania low	Western Sahara dispute locks AMU in chronic paralysis; no functional institutions; rivalry prevents even basic economic coordination
East African Community (EAC)	Kenya–Rwanda alignment vs. DRC; Kenya–Tanzania trade corridor competition; Uganda oscillates between blocs	Kenya strongest (2,470), Rwanda rising performer (1,040), DRC lowest (~650); Tanzania strong but inward-leaning	DRC highest (2.7%), Kenya & Rwanda moderate (1.3, 1.2), Tanzania low	Economic asymmetry + security rivalries produce unstable multipolarity; corridor competition undermines customs & monetary union goals
Southern African Development Community (SADC)	South Africa vs. Angola; Zimbabwe aligns with Angola; Botswana often supports SA	South Africa strongest (5,975), Botswana competitive, Angola volatile mid-range (3,320), Zimbabwe low & unstable	Angola highest (4.9%), Zimbabwe fluctuates, SA low (1.1%), Botswana low	Angola's hard-power parity constrains SA's legitimacy; mistrust weakens collective action & delays SADC security cooperation
Economic Community of West African States (ECOWAS)	Nigeria vs. Ghana & Côte d'Ivoire; UE-MOA–WAMZ monetary divide; Sahel withdrawals shift centre of gravity	Ghana (~2,570) ≈ Côte d'Ivoire (~2,520) > Nigeria (2,270, declining); Sahel states lowest	Côte d'Ivoire (1.1%), Nigeria moderate (0.8%), Ghana low (0.5%)	No accepted hegemon; monetary bifurcation + security crises fragment the bloc; Nigeria's inconsistent leadership weakens cohesion

Table 1. Power Configurations and Integration Constraints Across Four African Subregions.

The Effects of Shifts in Balance of Power on Regional Integration

The link between balance of power and regional integration has to do with the level of stability/ instability that the international system, or in this case the regional system holds. This implies that balance of power brings about an outcome of stability or instability within a system, and in turn the level of stability or instability determines the outcome of integration or disintegration. To put this into perspective it is important that we define what exactly is meant by the term “stability” in this case. The term stability in international politics is usually associated with the level of peace present in a system, or the level of endurance of a system even in the absence of peace. If we take a classic dictionary definition, the term stability is defined as “the state or quality of being stable, especially resistance to change, deterioration, or displacement; constancy of character or purpose; and reliability or dependability.” This definition describes the term ‘stability’ to be associated with ‘performance, resistance and reliability’, which is important to be able to link the concept of a stable system with how it is resistant to change, dependable and reliable. This helps us link the phenomena of unstable multipolarity to the concept of regional integration. Regional integration can be gauged by evaluating the resistance and performance of an established regional organization. This implies that the more stable a system essentially is, the more well integrated it is. As mentioned above, the balance of power shifts signals a multipolar system which is prone to instability according to realist and neorealist theory. The shifts in balance of power within the subregions of Africa have led to stagnated integration within the subregions and in turn within the wider regional organization- the African Union. The African Regional Integration index shows the performance of each African Union member states by tracking their individual levels of trade, free movement of people, infrastructural cooperation, and macroeconomic integrative initiatives. Below is a chart that shows each member state’s performance according to the African Regional Integration index (2019).

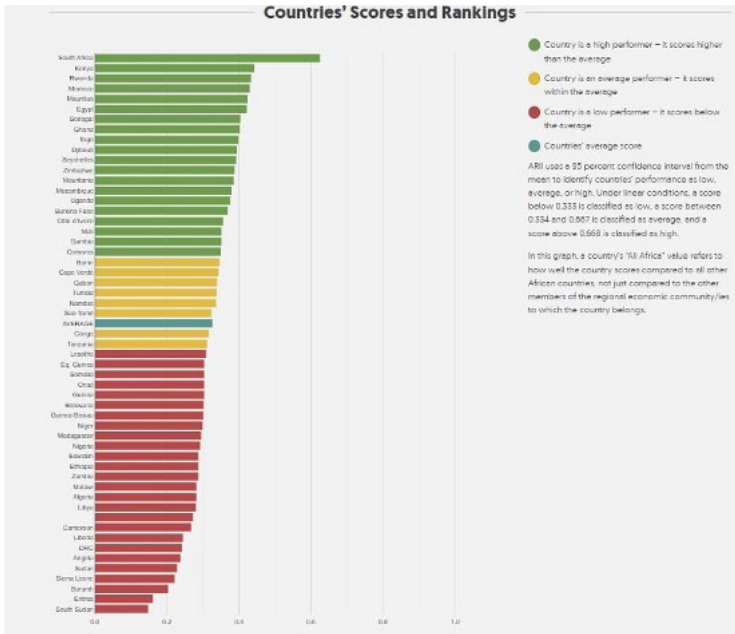


Figure. The African Union (AU) individual Member States integration scores as of 2019.

Source: <https://www.integrate-africa.org/rankings/all-africa/>

The integration index scores above show clear disparities between rivaling member states of each subregion. Morocco is significantly more well-integrated than Algeria in the AMU, Kenya and Rwanda is clearly more committed to the continental integration project than the DRC, in the EAC. In the SADC subregion South Africa is the most well-integrated state overall, and scores significantly higher than Angola, Zimbabwe and even Botswana. The reluctance of Nigeria to advance its integrationist incentives is clearly shown in the score index above, where Ghana and Côte d'Ivoire are considered as being a part of the high performing countries. All these disparities indicate that the ambition of the AU project to integrate the African region through its subregional pillars is a task impossible to achieve without the subregions being well-integrated themselves.

Prospects for an African Hegemon

Neorealism outlines a supporting theory to Robert Keohane's Hegemonic Stability theory, which points out to the pooling power of a regional hegemon. There is, however, a crucial point to remember here, "even though hegemony may

be based on power, it also requires the ability to persuade the other members that the hegemon's wishes correspond to the common interests, which presupposes a certain commonality of values." This implies that hegemony works like a two-sided coin i.e., a regional hegemon's strength isn't as strong as its capabilities alone but is also as strong as the recognition it receives from other states. Herewithin lies the crucial answer to the question of why there is not an African regional hegemon. As the African Integration Index (2019) has shown in the previous section, South Africa has been recognized by extra-regional powers to be an African regional hegemon. Rivalling South Africa with this descriptor is Nigeria, but as indicated above within the index, Nigerian incentives towards integration are significantly lower than that of South Africa. Although South Africa seems to have pioneered the continental integration project by showing its commitment as a high performer, its subregional rivalry is a great hindrance to its attainment of such a status. "While South Africa's leadership is fully accepted on the global stage, acceptance in Africa is lower. Far from being seen as a benevolent hegemon, South Africa is viewed by some other African states as a selfish hegemon bent on advancing its narrow economic interests at the expense of less developed African countries." This suggests that the prospects of an African regional hegemon are slim to say the least, but the solution to the stagnated integration is the power of a regional hegemon to pool or subordinate all other powers and set regional status quo.

Conclusion

Subregional rivalries and the resulting multipolar instability constitute a structural impediment to deeper African Union (AU) integration. While institutional and normative approaches explain important aspects of Africa's integration challenges, the comparative evidence across the AMU, EAC, SADC, and ECOWAS demonstrates that shifts in the balance of power, which are manifested through internal and external balancing, alliance realignments, and entrenched state-state rivalries, are central to understanding why integration has stalled. Neorealism highlights these dynamics as inherent to a regional environment where states prioritize relative advantage over collective gains (Waltz, 1979; Mearsheimer, 2014), resulting in institutional paralysis whenever integration is perceived to impose sovereignty costs or redistribute influence among competing subregional powers. The updated comparative indicators support this conclusion. In the AMU, the deadlocked Algeria-Morocco rivalry over Western Sahara precludes meaningful cooperation. In the EAC, the Kenya-Rwanda alignment and the DRC isolation sustain a fragmented multipolar environment marked by security competition. In SADC, Angola's hard-power profile and Zimbabwe's political-military networks constrain South Africa's leadership. In ECOWAS, Nigeria's material weight fails to translate into hegemony amid the rising Côte d'Ivoire-Ghana influence and the continually widening Anglophone-Francophone divide. These patterns show that the AU's supranational aspirations remain unattainable without resolving the subregional power configurations that undermine coordination and trust.

For the AU to advance its integration agenda, three interlinked steps are necessary. First, strengthening REC-level conflict management mechanisms would possibly help stabilize subregional rivalries before they spill over to the continental level. Second, policies that outline economic convergence, particularly through industrial cooperation, infrastructure harmonization and macroeconomic coordination, would reduce asymmetries that drive competitive balancing. Third, leadership at the continental level must combine material capability with legitimacy and shared values (Acharya, 2012), a way which recognizes that hegemony in Africa cannot be sustained through dominance alone but must be grounded in consent. Without addressing these foundational power realities, African regional integration will continue to advance in rhetoric more than in practice. A stable and more coherent African regional order depends on reconciling subregional power shifts with continental institutional ambitions, ensuring that the pursuit of relative gains does not permanently eclipse the collective goal of a more integrated and resilient African Union.

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Dijital Yönetim Doğal Kaynak Sürdürülebilirliğini Nasıl Etkilemektedir? BRICS-T Ülkelerinden Kanıtlar

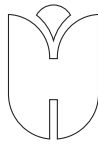
Cuma Demirtaş¹

Özet

Bu çalışma, BRICS-T ülkelerinde (2003-2021) e-devlet gelişiminin doğal kaynak sürdürülebilirliği üzerindeki etkisini, kantil regresyon analizi kullanarak incelemektedir. Kontrol değişkeni olarak ticari açıklık, finansal gelişme ve teknolojik gelişme değişkenleri kullanılmaktadır. Bulgular, dijital yönetişimin doğal kaynak rantlarına olan bağımlılığı azaltmada önemli bir rol oynamaktadır. Bu etki daha yüksek kantillerde güçlenmektedir. Bu durum, halihazırda yüksek kaynak bağımlılığı olan ülkelerde dijital yönetişimin daha da büyük bir azaltıcı etkiye sahip olduğu anlamına gelir. Ticari açıklık ise kaynak rantının temel itici gücü olduğunu doğrulamaktadır. Teknolojik gelişme ile finansal gelişme ise istatistiksel olarak anlamlı bir etki göstermemektedir. Bu bulgu teknolojik gelişmeyi temsil eden patent başvuruları ile finans sektörünün gelişmesinin kaynak sürdürülebilirliği üzerinde ölçülebilir bir etkiye sahip olmadığını ima etmektedir. Bu çalışma, dijital hükümet gelişiminin, doğal kaynak sürdürülebilirliğine olan ekonomik bağımlılığı azaltarak doğal kaynakların sürdürülebilirliğini desteklediğine dair ampirik kanıtlar sunmaktadır. BRICS-T ülkeleri için e-yönetim reformlarının hızlandırılması, daha yeşil büyümeye giden stratejik bir yol olabilir.

Anahtar Kelimeler: Dijital Hükümet, Doğal Kaynakların Sürdürülebilirliği, BRICS-T Ülkeleri

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How Does Digital Government Affect Natural Resource Sustainability: Evidence from BRICS-T Countries

Abstract

This study investigates the impact of e-government development on natural resource sustainability in BRICS-T countries over the period 2003-2021, employing quantile regression analysis. Trade openness, financial development, and technological development are included as control variables. The findings reveal that digital governance plays a significant role in reducing dependence on natural resource rents, with the effect becoming stronger at higher quantiles. This suggests that the mitigating influence of digital governance is more pronounced in countries with already high levels of resource dependence. In contrast, trade openness is confirmed as the primary driver of resource rents. Technological development and financial development, however, do not exhibit statistically significant effects. This indicates that patent applications (as a proxy for technological development) and financial sector advancement do not have a measurable impact on natural resource sustainability. Overall, the study provides empirical evidence that e-government development contributes to natural resource sustainability by diminishing economic reliance on resource rents. For BRICS-T countries, accelerating e-governance reforms could serve as a strategic pathway toward greener and more sustainable growth.

Keywords: Digital Government, Natural Resource Sustainability, BRICS-T Countries

Giriş

Son birkaç on yılda ekonomik kalkınma, sanayileşme ve küreselleşmenin hız kazanması, toplumsal refahı ve ekonomik dengeyi iyileştirse de ciddi çevresel riskleri beraberinde getirmiştir (UNEP, 2011). Çevre kalitesinden ödün vermeden sürdürülebilir ekonomik büyümenin sağlanması hem gelişmekte olan hem de gelişmiş ekonomiler için temel bir sorun olmaya devam etmektedir (Guan vd., 2024). Doğal kaynaklar, istikrarlı ekonomik kalkınma ve yaşam kalitesi açısından kritik rol oynamakta (Luo vd., 2022; Liang vd., 2022; Zhu, vd., 2025); aynı zamanda finansal sistemin güçlendirilmesi ve üretim süreçlerinin sürdürülmesi için vazgeçilmez bir unsur olarak değerlendirilmektedir (Yu, 2023; Ali vd., 2023). Bununla birlikte, doğal kaynakların yoğun şekilde tüketilmesi, enerji kullanımını artırmakta, sera gazı emisyonlarını yükseltmekte (Baloch vd., 2019) ve ekosistem üzerinde geri döndürülemez etkiler bırakmaktadır (Auty, 2007). Örneğin Birleşmiş Milletler Çevre Programı ve Birleşmiş Milletler İnsan Yerleşimleri Programı tarafından ortaklaşa yayınlanan “Küresel Çevre Görünümü: Şehir Sürümü” raporuna göre, 1970’den bu yana insan faaliyetleri kaynak çıkarmada keskin bir artışa yol açmış, küresel yıllık kaynak çıkarma 270 milyar tondan 920 milyar tona çıkmıştır. Bu sürdürülemez tüketim oranının, 2060 yılına kadar kaynak çıkarma miktarını iki katına çıkarması, küresel sera gazı emisyonlarını kötüleştirme, biyolojik çeşitliliğin %90’ından fazlasının ortadan kalkmasına, su kıtlığına yol açması ve küresel ekolojik denge için ciddi bir tehdit oluşturması beklenmektedir (Liu vd., 2024). Bu nedenle doğal kaynakların korunması, verimli kullanımı ve sürdürülebilir kalkınmanın sağlanması, günümüzün en acil küresel sorunlarından biri olarak öne çıkmaktadır (Liang vd., 2022; Khan vd., 2023).

Doğal kaynakların bolluğu hem gelişmiş hem de gelişmekte olan ülkeler için fırsat yaratırken, “doğal kaynak laneti” olgusu ekonomik gelişmenin yavaşlamasına ve sosyoekonomik kırılganlıkların artmasına neden olabilmektedir (Chen & Wang, 2025). Bu bağlamda, doğal kaynakların sürdürülebilir biçimde yönetilmesi ve kalkınma hedefleriyle uyumlu politikaların uygulanması büyük önem taşımaktadır (Byaro vd., 2022; Donkor vd., 2025). Bu bağlamda dijitalleşme ve dijital yönetim, doğal kaynak yönetiminde yeni fırsatlar sunmaktadır. Dijital hükümet ve dijital teknolojiler, kaynak kullanımını izleme, yönetme ve optimize etmede önemli bir araç olarak öne çıkmakta (Asogwa, 2013); büyük veri, yapay zekâ, blok zinciri ve bulut bilişim gibi teknolojiler karar alma süreçlerini daha verimli hale getirmektedir (Williamson, 2016; Jejenywa vd., 2024). Bu gelişmeler, sürdürülebilir kalkınma hedeflerine ulaşmada hükümetlerin proaktif rolünü daha da kritik kılmaktadır.

Dijitalleşme, yalnızca ekonomik genişlemeyi teşvik etmekle kalmamakta, aynı zamanda kaynak verimliliğini artırarak çevresel sürdürülebilirliği destekleyen bir unsur olarak dikkat çekmektedir (Grybauskas vd., 2022; Luo vd., 2023; Xu vd., 2025). Dijital yönetim, bir dizi yeşil teknoloji aracılığıyla hükümet platformlarının yapısal ve sürdürülebilir dönüşümünü kolaylaştırabilir. Böylelikle kaynak verimliliğini artırırken çevresel bozulmayı ve doğal kaynaklara bağımlılığı azaltabilir (Gao vd., 2024; Chen & Wang, 2025). Ayrıca, dijital yönetişimin inşası, büyük veri, bulut bilişim ve blok zinciri gibi teknolojilerden yararlanmayı içerir. Bu yaklaşım yalnızca akıllı denetimi ve erken afet uyarı yeteneklerini güçlendirmekle kalmaz, aynı zamanda hükümet işlerinde şeffaflık için kapsamlı bir bilgi platformu da oluşturur (Sarker vd., 2020; Chen & Wang, 2025). İşletmelerin ve kurumların hükümet karar alma süreçlerine katılmaları için yeni yollar yaratır ve hükümet, işletme ve halk arasındaki bilgi asimetrisini azaltarak etkileşimli bilgi alışverişlerini kolaylaştırır (Williamson, 1979; Ma & Zheng, 2019; Chen & Wang, 2025). Bu dönüşüm, asil-temsilci ilişkisini yeniden şekillendirerek doğal kaynak verimliliğini artırır. Dahası, bir dizi kural ve düzenleme oluşturmaktan sorumlu kurum olarak hükümetin dijital teknoloji odaklı yönetim değişikliklerini benimsemesi, kurumsal arzın kalitesini ve verimliliğini artıracak (Mulyawan, 2024) ve böylece hükümetle etkileşimde bulunan bireylerin işlem maliyetlerini düşürecektir (Williamson, 1979; Chen & Wang, 2025). Bu da bölgeler arası iş planlama sinerjilerini teşvik eder ve doğal kaynak verimliliğini daha da artırır (Han ve Deng, 2024; Chen & Wang, 2025; Zhu, vd., 2025).

Sonuç olarak, ekonomik kalkınma ile çevresel sürdürülebilirlik arasındaki dengeyi kurmak, doğal kaynakların etkin yönetimi ve dijital dönüşümün sunduğu olanakların değerlendirilmesiyle mümkündür. Ancak bu alanda yapılan çalışmalar sınırlı (Guan vd. 2024, Donkor vd. 2025, Liu vd. 2024, Zhu vd. 2025, Chen ve Wang 2025) sayıdadır. Bu bağlamda, çalışmanın amacı doğal kaynak yönetimi, dijital yönetim ve sürdürülebilir kalkınma arasındaki ilişkiyi BRICS-T ülkelerinde 2003-2021 dönemi için incelemektir. BRICS-T ülkelerinin incelenmesinin nedeni, bu ülkelerin hem hızlı ekonomik büyüme potansiyeline hem de zengin doğal kaynaklara sahip olmalarıdır. Aynı zamanda küresel enerji ve çevre politikalarında artan etkileri, dijital yönetim ve doğal kaynak yönetimi konularında özel bir önem taşımaktadır. Ekonomik büyümenin yol açtığı çevresel baskılar, bu ülkelerde sürdürülebilir kalkınma hedeflerine ulaşmada dijital teknolojilerin ve iyi yönetim uygulamalarının rolünü daha kritik hale getirmektedir. Bu nedenle BRICS-T ülkeleri, dijital yönetim ve doğal kaynak yönetiminin etkileşimini incelemek için uygun bir örneklem oluşturmaktadır.

Literatür İncelemesi

Dijital devletin gelişimi ve etkileri, uzun süredir akademik çevrelerde ilgiyle incelenmektedir. İlk çalışmalar daha çok dijital devletin evrim süreci (Marchionini ve Levi, 2003; Janowski, 2015), iş ortamını iyileştirme kapasitesi (Erkut, 2020) ve ekonomik kalkınmayı teşvik etme potansiyeline (Asgarkhani, 2005; Srivastava ve Panigrahi, 2016) odaklanmıştır. Ancak, dijital devletin doğal kaynak verimliliği üzerindeki etkisinin ampirik analizi görece yeni bir araştırma alanı olup, literatürdeki çalışmalar sınırlıdır (Chen ve Wang, 2025).

Hükümetlerin doğal kaynakların yönetiminde belirleyici rol oynadığı dikkate alındığında, dijital dönüşümün bu süreçlere yeni bir ivme kazandırdığı görülmektedir. Örneğin Liu vd. (2024), 2011-2021 döneminde Çin'deki 30 ilden için yaptıkları çalışma, dijital hükümetin doğal kaynak kullanım verimliliğini önemli ölçüde artırdığını göstermektedir. Bu artışın özellikle hükümet hizmetlerinin iyileştirilmesinden kaynaklandığı saptanmıştır. Ayrıca, piyasalaştırma düzeyinin dijital hükümetin etkisini olumlu yönde düzenlediği ve dijital altyapısı güçlü bölgelerde etkinin daha belirgin olduğu ortaya konmuştur. Benzer şekilde Zhu vd. (2025), Çin'de 281 şehirden (2010-2021) elde edilen verileri yarı doğal bir deney çerçevesinde analiz ederek dijital yönetim inşasının doğal kaynak verimliliği üzerindeki etkilerini incelemiştir. Sentetik kontrol, farkların farkı ve eğilim puanı eşleştirme gibi metodolojilerle yapılan analizler, dijital yönetim politikalarının teknolojik yenilik ve hükümet desteği aracılığıyla doğal kaynak verimliliğini iyileştirdiğini göstermiştir. Ayrıca, etkilerin endüstriyel yapı, kaynak bağıışı, şeffaflık ve pazar erişimi gibi faktörlere göre bölgesel farklılıklar sergilediği bulunmuştur. Chen ve Wang (2025), Çin'de 277 şehir için "Halk İçin Ulusal Pilot Bilgi Politikası" çerçevesini kullanarak dijital devlet girişimlerinin doğal kaynak verimliliği üzerindeki etkisini çift fark modeliyle değerlendirmiştir. Bulgular, dijital devletin doğal kaynak verimliliğini artırdığını, bunun yeşil inovasyon, düzenleyici uygulamalar, afet azaltma ve planlama faaliyetleriyle güçlendiğini göstermiştir. Ayrıca hukukun üstünlüğü ve dijital teknolojilerin, söz konusu ilişkinin yönünü olumlu biçimde şekillendirdiği vurgulanmıştır.

Literatür sadece Çin örneğiyle sınırlı değildir. Guan vd. (2024), 2003-2021 döneminde farklı kıtaları kapsayan panel veriler kullanarak dijital hükümetin doğal kaynak rantları üzerindeki etkilerini incelemiştir. 2SLS ve GMM yöntemleriyle yapılan analiz, dijital hükümetin özellikle Asya, Amerika ve Avrupa'da doğal kaynak rantlarını artırdığını; insan sermayesi, finansal gelişme ve ticaretin de bu artışı desteklediğini göstermiştir. Buna karşılık, dış çatışmaların Amerika ve

Avrupa'da doğal kaynak rantlarını azalttığı tespit edilmiştir. Afrika örneği üzerinden yürütülen bir başka çalışma, doğal kaynak bolluğu, yönetim kalitesi ve kamu harcamalarının çevresel sürdürülebilirlik üzerindeki etkilerini analiz etmektedir. Donkor vd. (2025), 42 Afrika ülkesini kapsayan çalışmalarında kaynak açısından zengin ve fakir ülkeler arasında farklı örüntüler bulunduğunu göstermiştir. Bulgular, karbon ve azot emisyonları açısından yönetim, kamu harcamaları ve doğal kaynak bolluğu arasındaki ilişkilerin heterojenlik gösterdiğini ortaya koymuştur. Bu da dijitalleşme ve yönetim politikalarının farklı ekonomik bağlamlara göre uyarlanması gerektiğini göstermektedir.

Genel olarak mevcut literatür, dijital hükümetin doğal kaynak verimliliği üzerinde olumlu etkiler yarattığını, ancak bu etkinin bölgesel özellikler, piyasa koşulları, dijital altyapı ve yönetim kalitesine bağlı olarak değiştiğini göstermektedir. Bununla birlikte, dijitalleşme–doğal kaynak verimliliği ilişkisinin ampirik olarak hâlen yetersiz incelendiği, özellikle Çin dışındaki ülkeler ve farklı ekonomik bağlamlara yönelik araştırmaların sınırlı olduğu dikkat çekmektedir. Dolayısıyla, bu alanda çalışmalar yürütülmesi, literatürdeki önemli bir boşluğun doldurulmasına katkı sağlayacaktır.

Veri ve Yöntem

Dijital hükümetin doğal kaynaklar üzerindeki etkisini analiz etmek amacıyla 2003-2021 dönemi için BRICS-T ülkelerine ait veriler çeşitli kaynaklardan derlendi. Değişkenler, kaynaklar vetanımlayıcı istatistikler hakkındaki ayrıntılar Tablo 1'de raporlanmıştır. Doğal kaynaklar değişkeni, GSYİH'nin yüzdesi olarak toplam doğal kaynak kiralaları (NRR) ile ölçülmüştür. Doğal kaynak kirası için veri serileri WDI'dan derlenmiştir. Dijital hükümet (DG), BM tarafından hesaplanan E-Devlet kalkınma endeksi ile ölçülmüştür. Doğal kaynak literatürünü (Khan vd., 2020; Okolo vd., 2024; Guan, vd.,2024) takip ederek modele bazı kontrol değişkenleri eklemiştir. Bunlar; teknoloji (Tech), finansal gelişme (FD) ve ticaret açıklığı (trade) içerir. Wang vd. (2023) ile Guan, vd. (2024), teknolojik ilerlemenin doğal kaynakların verimliliği üzerindeki olumlu etkisini bildirmiştir. Teknoloji (Tech) değişkeni toplam patent başvuruları ile ölçülür. Redmond ve Nasir (2020) ile Guan, vd. (2024), finansal gelişme ve ticaretin doğal kaynak verimliliğini olumlu etkilediğini belirtmiştir. Finansal gelişme (FD) bir endeks ile ölçülür. Ticaret ise GSYİH'nin yüzdesi olarak alınır. Teknoloji (Tech) ve ticaret için veri serileri WDI'dan toplanırken, finansal gelişme (FD) için IMF veri kaynağıdır. Bu kontrol değişkenleri, dijital hükümet ile birlikte, seçilen ülkelerdeki doğal kaynaklar üzerindeki birleşik etkilerini anlamak için analiz edilir.

Değişkenler	Tanımlar	Kaynaklar	Gözl./s.	Ort.	SS	Min.	Max.
NRR	Toplam doğal kaynak kiralari (% GSYİH)	WDI	114	0.494	0.484	-0.731	1.281
E-Gov	E-Devlet Gelişim Endeksi değeri	BM	108	-0.265	0.089	-0.448	-0.084
Tec	Patent başvurusu, toplam	WDI	114	4.450	0.728	2.923	6.200
FD	Finansal gelişme endeksi	IMF	114	0.517	0.072	0.368	0.674
Trade	Ticaret (% GSYİH)	WDI	114	1.648	0.119	1.345	1.852

Tablo 1. Değişken açıklamaları, kaynaklar ve tanımlayıcı istatistikler.

Bu çalışma öncelikle panel veriye uygun ekonometrik araçların kullanımını gerektiren panel veri analizine odaklanmaktadır. İlk endişe bağımsız değişkenler arasında yüksek korelasyonun olması çoklu bağlantı sorununa neden olmaktadır. Çoklu bağlantı sorunu olması durumunda, regresyon katsayılarının yanlış tahmin edilmesine, katsayıların varyansı ile standart hatasını artırma ve istatistiksel gücü azaltma gibi sorunlara neden olmaktadır. Bu nedenle modeli tahmin etmeden önce, bağımsız değişkenler arasında çoklu bağlantı varsayımının test edilmesi gerekmektedir (Gujarati, 2011). Bu sorunun tespitinde, Variance Inflation Factor (VIF) testinden yararlanılmıştır. Bu test, regresyon modelinde standart hataların şişirilmiş katsayılarının neden olduğu p değerlerindeki sapmayı değerlendirir. Kabul edilebilir maksimum VIF, standart hataların karesinin dört katıdır (Arvas vd. 2023).

Değişken	VIF	1/VIF
FD	2.05	0.487244
Ingov	1.39	0.720812
Intrade	1.35	0.739710
Intec	1.21	0.824463
Mean VIF	1.50	-

Tablo 2. VIF testi sonuçları.

VIF testinden elde edilen bulgulara göre ortalama VIF (2,45) baz alındığında çoklu bağlantı mevcut değildir ve bağımsız değişkenlerin bireysel VIF'leri Tablo 2'de gösterilmektedir. Tüm değişkenlerin VIF değerleri 5'in altındadır. Bu durum çoklu bağlantının modelde bir sorun olmadığını göstermektedir.

İkinci endişe, panel veriler arasında yatay kesit bağımlılığının (CD) varlığını ele almaktır. Söz konusu ekonomiler bazı benzerlikleri paylaşırsa da bu benzerlikler ekonometrik araştırmalarda, özellikle panel tahminlerinde hatalı bulgulara yol açabilir. Günümüzün küreselleşmiş ekonomik pazarında, çeşitli faktörler bir ülkeyi dünyanın geri kalanıyla son derece bağlantılı hale getirebilir. Böylelikle, belirli bir alandaki bir parametredeki değişiklik, başka bir bölgeyi veya ülkeyi etkileyebilir. CD'nin ihmal edilmesi, hatalı veya taraflı sonuçlara yol açabilir (Demirtaş, 2025). Bu bağlamda genel değerlendirmeyi yapmadan önce CD açısından da test edilmesi gerekir.

Test	Statistik	Prob.
LM (Breusch & Pagan, 1980)	47.23	0.0000
LMadj (Pesaran et diğ., 2008)	9.915	0.0000
CDLM (Pesaran, 2004)	5.807	0.0000

Tablo 3. CSD Result.

Tablo 3'teki bulgular CD'nin varlığını kabul etmektedir. Bu durum ikinci nesil testlerin kullanmasını gerektirir. Panel veriler arasında CD'nin yanısıra eğim heterojenliğinin varlığını da ele almak gerekmektedir. Bu nedenle homojenlik testi yapılarak eğim katsayılarının homojen mi yoksa heterojen mi olduğunun tespit edilmesi gerekmektedir. Böylelikle slope katsayılarının homojenliği, kullanılan model türünü belirlemede kritik bir öneme sahiptir. Bunun için Pesaran ve Yamagata (2008) tarafından geliştirilen homojenlik testi kullanılmıştır.

Test	Pesaran-Yamagata (2008)	
	Değer	Prob.
Delta (Δ)	2.446	0.014
Delta-ayarlı (Δ -Düz.)	2.996	0.003

Tablo 4. Homogeneity test.

Pesaran ve Yamagata (2008) testi, slope katsayılarının homojen olmadığını ve değişkenlerin etkilerinin birimler arasında farklılık gösterdiğini ortaya koymaktadır. Bu bulgu, geleneksel sabit veya rastgele etkiler modellerinin sınırlamalarını ve heterojenlik içeren modellerin veya kantil regresyon yaklaşımlarının kullanım gerekliliğini işaret etmektedir. Sonuç olarak, değişkenlerin etkilerini farklı dağılım noktalarında inceleyebilmek ve olası heterojenliği yakalayabilmek için MM-QR yöntemi tercih edilmektedir. Böylelikle heterojen etki potansiyelleri göz önünde bulundurularak güvenilir çıkarımlar sağlanabilir.

Kantil	Ingov	Intrade	Intec	FD
0.1	-0.687* (0.078)	2.191*** (0.000)	0.049 (0.804)	0.518 (0.418)
0.2	-0.853*** (0.003)	2.101*** (0.000)	0.051 (0.728)	0.388 (0.414)
0.3	-0.970*** (0.000)	2.039*** (0.000)	0.052 (0.655)	0.297 (0.436)
0.4	-1.053*** (0.000)	1.994*** (0.000)	0.053 (0.604)	0.232 (0.488)
0.5	-1.133*** (0.000)	1.951*** (0.000)	0.054 (0.573)	0.170 (0.590)
0.6	-1.231*** (0.000)	1.898*** (0.000)	0.055 (0.582)	0.093 (0.777)
0.7	-1.336*** (0.000)	1.842*** (0.000)	0.057 (0.632)	0.012 (0.976)
0.8	-1.411*** (0.000)	1.801*** (0.000)	0.058 (0.673)	-0.047 (0.915)
0.9	-1.557*** (0.000)	1.723*** (0.000)	0.060 (0.740)	-0.161 (0.783)

Tablo 5. Tahmin sonuçları.

Not: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; p-values in parentheses.

Tablo 5'teki bulgulara göre, dijital hükümet (Ingov) değişkeninin doğal kaynak rantları (Inrent) üzerindeki etkisi tüm kantil düzeylerinde istatistiksel olarak negatif bulunmuştur. Ayrıca, kantil seviyeleri yükseldikçe bu negatif etkinin şiddetlendiği görülmektedir. Bu sonuç, dijital hükümet uygulamalarının doğal kaynak bağımlılığını azaltıcı bir rol oynadığını ve özellikle kaynak rantlarının yüksek olduğu ülkelerde daha güçlü bir etki yarattığını göstermektedir.

Dışa açıklık (*Intrade*) değişkeni ise tüm kantillerde pozitif ve anlamlı etkiye sahiptir. Bununla birlikte, kantil seviyesi arttıkça pozitif etkinin zayıfladığı gözlenmektedir. Bu bulgu, ticari açıklığın kaynak rantlarını artırıcı bir unsur olduğunu, ancak bu etkinin daha yüksek rant düzeylerinde sınırlı kaldığını ortaya koymaktadır.

Teknolojik yenilik (*Intec*) ve finansal gelişme (*Infid*) değişkenlerinin kaynak rantları üzerindeki etkisi genel olarak pozitif ancak istatistiksel olarak anlamsızdır.

Genel olarak sonuçlar, BRICS-T ülkelerinin yapısal özellikleriyle uyumludur. Zira bu ülkelerde dijital dönüşüm ve kurumsal kapasitenin artışı doğal kaynak bağımlılığını azaltma potansiyeli taşırken; dışa açıklık, teknoloji ve finansal gelişme gibi unsurlar kaynak rantlarını farklı kantillerde farklı yönlerde etkilemektedir. Özellikle dijital hükümetin negatif etkisi, bu ülkelerin “doğal kaynak bağımlılığından uzaklaşma” hedefiyle örtüşmektedir.

Sonuç ve Politika Önerileri

2003-2021 döneminde BRICS-T ülkelerine yönelik MMQR analizinden elde edilen bulgular, dijital hükümetin doğal kaynak rantlarını tüm kantillerde negatif etkilediğini ve bu etkinin rant düzeyi arttıkça daha da güçlendiğini ortaya koymaktadır. Bu durum, dijitalleşmenin kaynak bağımlılığını azaltıcı bir rol oynadığını ve kaynak gelirlerinin daha şeffaf ve etkin yönetilmesine katkı sunduğunu göstermektedir. Buna karşın ticari açıklığının doğal kaynak rantlarını artırıcı bir etkisi olsa da etkisi daha yüksek kantillerde zayıflamaktadır. Patent başvuruları ile ölçülen teknolojik yenilik (*Intec*) ve finansal gelişme (*Infid*) değişkenlerinin kaynak rantları üzerindeki etkisi genel olarak pozitif ancak istatistiksel olarak anlamsızdır.

Bu bulgular ışığında bazı politika önerileri geliştirilebilir. İlk olarak dijitalleşmenin kaynak bağımlılığını azaltıcı rolü dikkate alınarak e-devlet uygulamaları daha da yaygınlaştırılmalıdır. Doğal kaynak gelirlerinin dijital platformlarda izlenebilir hale getirilmesi, yolsuzlukla mücadele ve şeffaflık açısından kritik önemdedir. İkinci olarak, ticari açıklığın kaynak rantlarını artırıcı etkisi dikkate alındığında, ihracat yapısının çeşitlendirilmesini zorunlu kılmaktadır. BRICS-T ülkeleri, doğal kaynak ihracatına bağımlılığı azaltmak için yüksek katma değerli sanayi ve hizmet ürünlerinin ihracat payını artırmalıdır. Üçüncü olarak, patent faaliyetlerinin kaynak temelli sektörlerde yoğunlaşması, teknolojik yeniliklerin sürdürülebilirlik hedefleriyle uyumunu engellemektedir. Bu nedenle AR-GE teşvikleri yenilenebilir enerji, yeşil teknolojiler ve sürdürülebilir üretim süreçlerine yönlendirilmelidir. Son olarak, finansal gelişmenin kaynak rantlarını artırıcı etkisi dikkate alındığında, finansal kaynakların çevresel sürdürülebilirlik projelerine kanalize edilmesi önem taşımaktadır. Yeşil tahvil piyasaları, sürdürülebilir bankacılık ürünleri ve çevre dostu krediler desteklenerek finansal gelişme kaynak bağımlılığını azaltacak şekilde yönlendirilmelidir.

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Strengthening Public Sector Governance through Youth Leadership and Strategic Partnerships: Evidence from Emerging Public Leaders Fellowship Program in Africa

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Abstract

Public institutions in many African countries continue to face persistent governance challenges including limited human resource capacity, bureaucratic inefficiencies, and underrepresentation of youth and women in decision-making roles. The Emerging Public Leaders (EPL) program seeks to address these issues by strengthening the talent pipeline into government through the recruitment and placement of highly, skilled, ethical and motivated young leaders. This study examines how EPL contributes to public sector governance reform through youth leadership development and strategic institutional partnerships across Ghana, Liberia, Kenya, and Malawi.

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Using a mixed methods design that combines document analysis, semi-structured interviews, focus groups, and online surveys, the study analyzes measurable outcomes such as retention and promotion rates of fellows, gender representation, and institutional performance improvements. Findings indicate that 37-45% of fellows have advanced within two years of placement, 52% are women, and fellows have contributed to measurable service delivery gains, including a 42% reduction in case processing time in Kenya's Correctional Services and a 57% improvement in digital documentation efficiency within Ghana's education sector.

The results suggest that programs like EPL can serve as effective vehicles for strengthening governance systems by embedding young professionals in public institutions while fostering inclusion, accountability, and innovation. However, the study also acknowledges limitations related to data access and researcher affiliation. The findings contribute to scholarly and policy discussions on building sustainable, youth-driven governance models in sub-Saharan Africa.

Keywords: Youth Leadership, Governance Reform, Institutional Capacity, Inclusion, Public Administration, Strategic Partnerships

Introduction

Effective governance and sustainable development are crucial, and the role of strong public institutions cannot be overstated. However, in many African countries, public institutions face systemic challenges such as limited human resource capacity, outdated systems, bureaucratic inefficiencies, and a lack of diversity in public leadership. These deficiencies weaken service delivery in public institutions.

One of the most persistent issues in African governance is the underrepresentation of youth and women in decision-making spaces. Even though young people under the age of 35 make up more than 60% of Africa's population, they remain marginalized in public leadership and policymaking roles. Structural barriers such as political gatekeeping, lack of mentorship, and inadequate leadership pipelines mean that many talented young professionals are excluded from the systems that shape their countries' futures. Similarly, women continue to face cultural, institutional, and legal barriers that restrict their participation and influence in governance.

Recent studies confirm that generational renewal within bureaucracies enhances innovation, transparency, and citizen responsiveness (Dzansi & Molefe, 2022; Tessema & Soeters, 2018). Evidence from comparative governance research shows that youth inclusion correlates with improved accountability and reduced

corruption perception in African civil services (Ayee, 2020; Asongu & Odhiambo, 2019). This paper contributes to that growing literature by examining the EPL model as an endogenous pathway for institutional strengthening.

This paper investigates how the EPL Fellowship Program contributes to strengthening public sector governance across 5 Operational countries for EPL; Liberia, Ghana, Kenya, Malawi and Sierra Leone and will focus on two central themes: (1) youth leadership in public service and (2) the role of strategic partnerships in institutional capacity building.

This paper argues that deliberate investments in youth-focused leadership development, anchored in strategic and accountable partnerships, can be a powerful lever for reforming public institutions and achieving sustainable development goals. The findings from this study contribute to a growing body of knowledge on governance innovation in Africa and offer lessons for governments, donors, and civil society actors seeking to strengthen public institutions through inclusive, forward-looking leadership models

This paper is organized as follows: the introduction part, followed by context and background followed by the third part which is literature review. The fourth introduces background information on research and methodology. After analysis and findings of the study, this paper concludes with key points, recommendations, future research directions and limitations.

Context and Background

Across Africa, public institutions face different challenges that provide a hindrance to their ability to deliver quality services as well as respond to citizens' needs and drive sustainable development. Most Common issues include inadequate human resource systems, high turnover of skilled staff, political interference, weak coordination mechanisms, and outdated administrative processes (World Bank, 2021). The African Union Commission (2019) highlights that these institutional shortcomings are then worsened by demographic pressures: with over 75% of Africa's population under the age of 35, the continent faces both an urgent need and opportunity to invest in a young generation of public leaders who are equipped to transform the public sector from within.

Even though this is the case, young people and women, despite representing a majority in many African countries, remain underrepresented in government roles and leadership. Some noted barriers to entry into civil service roles include rigid hiring processes, lack of exposure to public administration, limited mentorship

opportunities, and cultural norms that favor older or male candidates (Ayee, 2012). Due to this, youths often perceive government as inaccessible or ineffective, further widening the trust gap between citizens and the state (UNDP, 2020).

To address these issues is the Emerging Public Leaders (EPL) coming in with a vision of a prosperous and equitable Africa, fostered by good governance and a mission to partner with governments, local organizations and communities to rigorously identify public service professionals who are committed to practicing and promoting good governance in Africa.

Originally launched in Liberia in 2009 under the President Young Professionals Programs (PYYPP), co-founded by the former woman president of Liberia, EPL was designed to address these challenges by creating a generation of ethical, competent, and effective young leaders in the public service. EPL's approach is centered on the belief that transformative leadership, especially when it reflects the demographic diversity of the population, is critical for building stronger and more accountable institutions. By placing carefully selected young professionals into key roles within government ministries, agencies, and departments, the EPL Fellowship aims to improve public sector performance while building a pipeline of future leaders committed to public service. (Emerging Public Leaders, n.d).

EPL has since expanded to Ghana, Kenya, Malawi, and Sierra Leone. In each country, the model is tailored to national priorities and implemented in partnership with government institutions such as public service commissions, government ministries, department and agencies (MDAs), as well as government training schools.

In Liberia, EPL has grown into a national talent pipeline. Alumni of the program now serve in senior government roles and lead reform efforts across ministries. Similarly, in Ghana, Fellows have been deployed to ministries such as Finance, Gender, and Education, where they contribute to strengthening data systems, improving service delivery, and advancing policy reforms (Emerging Public Leaders, n.d).

In Kenya, the Public Sector Fellowship Program (PSELF), launched in 2021, and become the fastest growing of EPL's initiatives, with 116 Fellows graduated to date 48% of whom are women. The program targets young civil servants already in government, enhancing their leadership capacity and strengthening institutional performance. Representation is notably broad, with Fellows and alumni from 46 out of 47 counties, and 9% of the current cohort comprising people with disabilities highlighting EPL's commitment to diversity and inclusion. A key innovation

of the program is its capstone projects, which connect Fellows to senior policy-makers, enabling them to directly influence problem identification, policy formulation, implementation, and review. (Emerging Public Leaders, n.d).

In Malawi, EPL's formal partnership with the Government of Malawi was signed in November 2023 and later followed high-level engagements with the Office of the President and Cabinet. This commitment has led to the development of a detailed implementation plan for nationwide rollout, staff recruitment, and the co-design of training and placement protocols (Emerging Public Leaders, n.d). Fellows in Malawi are supporting ministries with policy development, performance tracking, and community engagement, including initiatives in rural schools that target youth empowerment and inclusive development. EPL Malawi further collaborates with the Malawi School of Government to contextualize leadership training for Fellows hence ensuring alignment with country specific and local capacity-building frameworks (Emerging Public Leaders, n.d).

Recently operating in Sierra Leone, EPL is reciprocating the model with the same mission and vision of recruiting talented ethical young leaders to be part of the movement for transforming governance in Africa.

These developments by EPL align with the Sustainable Development Goals (SDGs) and particularly SDG 16 which focuses on peaceful and inclusive societies for sustainable development and SDG 17 that focuses on strengthening global partnerships to support the achievement of all other SDGs. EPL's commitment to diversity and institutional partnerships embodies these global principles by enhancing both representation and institutional resilience (UN, 2015).

Literature Review

The growing interest in youth leadership and public service transformation across Africa has given rise to a diverse set of fellowship and leadership development programs. These initiatives have aimed to address the institutional capacity gap as well as increase diversity and inclusion in different sectors including governance. The Emerging Public Leaders (EPL) Fellowship Program fits within this evolving ecosystem of youth-centered governance models.

Theories of public service leadership emphasize the critical role of human capital in shaping governance outcomes (Grindle, 1997; Andrews, 2013). In contexts where bureaucracies are aging and often underperforming, youth leadership programs offer a means of institutional renewal by injecting new energy, innovation, and values into government systems (World Bank, 2021).

Comparative Programs

Mastercard Foundation Scholars Program

The Mastercard Foundation Scholars Program is a leading example of large-scale youth investment aimed at leadership development for social transformation. This program does not entirely focus on public sector governance; however, the program supports young leaders from disadvantaged backgrounds with education, mentorship, and leadership development opportunities to prepare them for impact in their home communities and countries. Its emphasis on ethical leadership, inclusion, and community impact aligns with EPL's theory of change (Mastercard Foundation, 2022). The Scholars Program has produced alumni who are engaged in public sector reforms, civic initiatives, and social entrepreneurship across Africa.

Global Health Corps (GHC) Fellowship

The Global Health Corps Fellowship places young professionals in public health institutions and government departments to improve health systems while building leadership capacity among emerging changemakers. GHC combines service placement with cross-cultural exchange, mentorship, and professional development. Like EPL, it focuses on equity, collaboration, and systems thinking, and has demonstrated success in enhancing institutional responsiveness through youth engagement (GHC, 2021). The GHC model reinforces the idea that fellowship programs embedded within government systems can accelerate institutional performance while cultivating a pipeline of ethical, competent leaders.

Mo Ibrahim Leadership Fellowship

The Mo Ibrahim Leadership Fellowship, administered by the Mo Ibrahim Foundation in partnership with institutions like the African Development Bank and the UN Economic Commission for Africa, targets young African professionals with a demonstrated commitment to public service. Fellows are placed with executive-level leadership teams to gain firsthand experience in governance and policymaking. While highly selective and elite in design, the program emphasizes exposure, mentorship, and strategic policy engagement, mirroring EPL's capstone innovation and high-level policy immersion strategies. (Mo Ibrahim Foundation, 2023).

Young African Leaders Initiative (YALI)

Now the Mandela Washington Fellowship, YALI was established in 2010 to bring selected Africans to the U.S. for six-week leadership programming. While not embedded in domestic government, it cultivates civic leadership, entrepreneurship and governance awareness among youth. Many alumni highlight the transformative effect of networking and leadership exposure across Africa, not just the U.S. experience. (Olapode, 2014).

The Distinctive Value of EPL

While programs like the Mastercard Foundation, GHC, and the Mo Ibrahim Fellowship contribute to Africa's broader leadership development ecosystem, EPL is distinct in its deep integration within national public sector systems. EPL's model places young leaders directly into government ministries and agencies for a full year or longer, addressing institutional needs while supporting leadership growth. Its focus on youth already serving within the civil service (e.g., in Kenya) and its emphasis on sustainability through national partnerships set it apart. These features align with recommendations in the public administration literature that emphasize "problem-driven iterative adaptation" and long-term institutional strengthening rather than externally driven reform (Andrews et al., 2017).

Beyond fellowship programs such as the Mastercard Foundation or Global Health Corps, a growing body of empirical research highlights how youth-oriented leadership pipelines can reinforce bureaucratic performance and legitimacy. For instance, Tessema and Soeters (2018) demonstrate that leadership development within public bureaucracies improves motivation and retention when embedded in local institutional frameworks. Dzansi and Molefe (2022) find that structured mentorship and ethics training significantly correlate with civil service professionalism across Southern Africa.

Recent governance scholarship also emphasizes "adaptive capacity" and co-creation models in public administration (Peters & Pierre, 2020; Devarajan, 2022). These frameworks argue that hybrid partnerships linking state, civil society, and academic actors are more likely to produce sustainable reform outcomes. EPL's design aligns with this perspective by promoting nationally owned, partnership-driven capacity building rather than externally imposed reforms (Ohemeng & Ayee, 2022; Brinkerhoff, 2021).

Methodology

Data were collected between January and April across four the EPL operational countries; Ghana, Liberia, Malawi. The study focused on three interrelated dimensions: (1) youth leadership development outcomes; (2) inclusion and representation in the civil service; and (3) the role of strategic partnerships in sustaining institutional reforms.

Data Sources

The literature review was grounded in two key categories of sources:

Internal EPL Program Documents

Four core internal sources informed the quantitative and qualitative evidence base:

1. EPL's Impact Report (2025): focused in Ghana, Liberia and Kenya, the report has focused on documenting outcomes related to leadership development, representation, institutional performance, and policy influence.
2. Mid-Term Program Review (2025): assessing progress toward objectives, institutional buy-in, and fellow contributions to civil service reform.
3. PSELF Evaluation Report (2025): an independent evaluation of the Public Sector Fellowship Program in Kenya, focusing on leadership growth, placement effectiveness, gender inclusion, and government satisfaction.
4. EPL Strategic Plan 2023-2025: outlines the organization's roadmap for expanding its impact in strengthening public sector leadership across

Survey Data

From the Mid-term evaluation, structured online surveys were conducted to gather quantitative data from fellows, alumni, and mentors/supervisors. The survey assessed progress toward program outcomes, the relevance of the fellowship to participants' current work roles, and the quality of mentor support. A census approach was adopted; all current fellows and alumni who joined the program from October 2022 onwards were invited to participate. In total, 117 out of 192 eligible fellows and alumni responded to the survey, representing a response rate of 60.9%. Descriptive characteristics of the respondents are presented in the results section. In addition, 15 mentors responded to the survey; 6 identified as Mentors and 9 as Supervisors. In terms of gender, 6 participants (40%) were female and 9 (60%) were male. Country-level data showed that Liberia had one mentor respondent,

while Ghana had 14 mentor/supervisor responses (5 mentors and 9 supervisors). Among these, 5 participants (35.7%) were female and 9 (64.3%) were male

External Literature

To provide broader theoretical and comparative context, academic and policy literature was reviewed from the following sources:

Peer-reviewed journal articles from databases such as Google Scholar and JSTOR.

Policy briefs and institutional reports from organizations such as the World Bank, African Union, UNDP, and OECD.

Findings and Discussion

Institutional Capacity Growth

Evidence suggests EPL Fellows strengthen governance systems by increasing the technical and soft-skill capacities within ministries. PSELF data indicates that Fellows climb civil service ranks faster than peers with similar qualifications, suggesting fellowship experiences accelerate effective performance and recognition within institutions. (PSELF Evaluation Report, 2025). Furthermore, in Kenya, The PSELF program triggered tangible improvements within government institutions whereby In Correctional Services, fellows introduced anti-corruption protocols that reduced case processing times by 42%. (PSELF Evaluation Report, 2025). The health sector experienced a threefold improvement in emergency response through enhanced cross-county coordination, while the education ministry cut paperwork by 57% via digital transformation. (PSELF Evaluation Report, 2025).

The Public Service Fellowship Mid-Term Evaluation (2025) demonstrates measurable institutional outcomes. Among 117 fellows and alumni, 100% rated training as useful, 88% as very useful, and 55% of partner institutions reported moderate to significant institutional change.

In Ghana, 53% of supervisors reported reforms such as digital record management cutting paperwork by 57%. In Liberia, 56.8% of institutions reported improved administrative practices, while Malawi recorded 56.3% institutional change rates. These data indicate the fellowship's contribution to public sector modernization through embedded, ethical leadership.

In Malawi, Fellows have been engaged in works centered around policy fellows where a fellow sits on the National Youth advisory board providing inputs on

key national issues with regards to the youth. Through mentorship and peer learning, the program has built fellows confidence and institutional memory. Government supervisors frequently cite improved project execution and adherence to performance standards where Fellows are embedded. (Emerging Public Leaders, n.d)

Youth Inclusion, Representation & Equity

Across EPLs operational countries, 47% of fellows were women, with Malawi at 55% and Liberia at 49%. Persons with disabilities made up 1.7% of participants. Female fellows showed higher satisfaction with mentorship, 97.5% overall satisfaction, with most rating it “very satisfactory.”

Community engagement participation stood at 94.9%, reaching 100% in Ghana and Malawi. Fellows reported increased civic responsibility and policy awareness through community projects.

This approach compliments with broader youth inclusion movements across Africa, including advocacy groups like YIAGA Africa, which mobilize young people for democratic participation and amplify youth voices in policymaking (Yiaga Africa, n.d)

In focus group discussions, female Fellows express enhanced leadership confidence and willingness to seek promotions. Inclusion in decision-making roles not only improves equity but also diversifies policy perspectives, enhancing service delivery to underserved communities. Furthermore, according to the EPL Impact report (2025), over 53% of fellows indicated they would have been unlikely to join the civil service without the EPL program, highlighting its transformative recruitment function. The recruitment process successfully attracts young professionals from diverse backgrounds, many of whom enter the public sector for the first time through the fellowship. (EPL Impact Report ,2025)

Mentorship, Skill Development, and Career Advancement

79.5% of fellows received structured mentorship, with 47% rating it highly effective. A combined 97.5% expressed satisfaction, and 92.3% rated training quality good or excellent. All respondents confirmed improved leadership and technical competencies. Employment outcomes were equally strong: 72.6% remained in fellowship roles, 18.8% transitioned to public sector jobs, 4.3% entered private employment, and only 0.9% were unemployed. Furthermore, 91.5% of fellows reported better well-being, gains in life satisfaction, food security, and access to services. Over 92% described their current work as fulfilling, with 41% completely fulfilled. Liberia recorded the highest well-being improvement (93.8%).

Strategic Partnerships & Sustainability

EPL's model is anchored in formal Memorandums of Understanding with country governments that bond institutional commitments across government's executive, civil service commissions, and government training agencies. These partnerships enable context-sensitive adaptation of curricula, ensure placement in meaningful roles, and embed program sustainability even across political administrations.

EPL's partnerships with public service commissions, ministries, and training schools have institutionalized youth leadership pathways. 95% of respondents affirmed program relevance to public sector needs, and 94% expressed confidence in its long-term sustainability. Collaborations such as that with the Malawi School of Government demonstrate effective localization of training and curriculum integration.

Furthermore, 88.2% of fellows believe the program's impact is very likely or likely to continue beyond its formal end. Fellows and mentors alike agree that the continued presence of EPL fellows can positively influence public service culture over time. (EPL Impact Report, 2025).

These partnership results echo recent comparative evidence that collaborative leadership and multi-actor governance approaches enhance institutional resilience and long-term policy coherence (Peters & Pierre, 2020; Brinkerhoff, 2021). EPL's government-embedded model exemplifies how "networked governance" can translate leadership investments into enduring administrative reform.

Conclusion

This paper examined the role of the Emerging Public Leaders (EPL) Fellowship Program in addressing critical governance challenges in public sectors through youth leadership development and strategic institutional partnerships. Evidence from Ghana, Liberia, Kenya and Malawi demonstrates that EPL's approach, which is centered on recruiting, training, and embedding young professionals in government ministries, departments and agencies has not only enhanced human capital within the civil service but also created pathways for inclusive, ethical, and innovative public leadership.

The findings confirm that youth leadership in the public sector is not just aimed toward demographic inclusion; it is also a transformative strategy that strengthens service delivery, accelerates institutional reform, and enhances public accountability.

By equipping Fellows with knowledge of governance, soft and technical skills, mentoring, and real-time exposure to public administration, EPL contributes to the development of a value-driven and performance-oriented public workforce.

Furthermore, the program's emphasis on strategic partnerships, particularly with public service commissions, government MDAs, and training institutions has proven to be critical in achieving scale, policy alignment, and sustainability. By working with government rather than around it, EPL ensures that its interventions are embedded in national systems, adapted to local contexts, and positioned to influence broader civil service reform agendas. This ecosystem approach aligns with good global practice in governance strengthening, which emphasizes collaboration, local ownership, and capacity transfer (World Bank, 2021; UNDP, 2020).

While the program's results are promising, sustainability and impact will depend on continued investment, stronger national frameworks for youth leadership, and systemic reforms that go beyond individual placements. EPL's model must be complemented by broader policy shifts such as civil service recruitment reforms, gender equity frameworks, performance monitoring systems, and leadership succession planning to create an enabling environment where youth and women can thrive long-term.

Recommendations

Institutionalize Youth Leadership Pathways in the Public Sector

Governments should create structured entry points for young professionals into the civil service beyond internships or political appointments. This includes revising public service recruitment policies to allow for competitive and inclusive graduate entry programs modeled on the EPL Fellowship and developing clear career progression pathways for young civil servants.

Strengthen Strategic Partnerships for Scale and Sustainability

EPL's success is deeply tied to its collaborative approach with public institutions. Ministries, civil service commissions, and donors should replicate this approach by formal partnerships with youth development organizations, and civil society to co-create leadership development initiatives rooted in national priorities.

Ensure Political and Financial Commitment

For initiatives like EPL to thrive, governments must demonstrate both political will and financial commitment. This includes allocating national budgets for public service leadership programs, reducing dependency on donor funding, and integrating such models into national public sector reform strategies and medium-term development plans.

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Empowering a Generation: Transforming Public Service through Youth Fellowships-A Case of EPL Operational Countries in Africa

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Abstract

The African Union (2017) highlights Africa's demographic dividend as a critical opportunity for accelerating development. However, realizing this potential depends on strategic investments in youth empowerment and public sector transformation. Across the continent, young people constitute a significant share of the population but often lack the pathways, resources, and platforms to meaningfully engage in governance and public service leadership.

The Emerging Public Leaders (EPL) Fellowship Program addresses this gap by recruiting, training, and placing talented, ethical, and motivated young

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professionals into key roles within government ministries, departments, and agencies across Liberia, Kenya, Ghana, Sierra Leone, and Malawi. This program aims to cultivate a new generation of agile, competent, and values-driven public sector leaders capable of advancing institutional reforms and driving systemic change.

Using a desk-based, secondary research approach –document reviews, and institutional data– the paper examines the transformative impact of EPL’s fellowship model in these five operational countries. It explores how young fellows contribute to strengthening public administration, improving policy implementation, and enhancing responsiveness to citizen needs.

The study argues that fostering youth leadership within public service not only aligns with national and continental governance agendas (including AU’s Agenda 2063) but also serves as a critical strategy for unlocking Africa’s demographic dividend and promoting inclusive, sustainable development. The paper concludes by proposing a framework for scaling this model across additional countries, highlighting lessons learned and best practices for integrating youth into public sector leadership pipelines.

Keywords: Youth Empowerment, Demographic Dividend, Public Service, Leadership, Governance, Sustainable Development, Africa, Agile Public Administration

Introduction

Africa stands at a pivotal demographic moment. Over 60 percent of its population is under the age of 25, representing the largest concentration of young people in the world (African Union, 2017). This youthful demographic offers a unique window of opportunity –often referred to as the demographic dividend– where the working-age population outnumbered dependents, creating the potential for accelerated economic growth, improved governance, and social transformation. However, this potential is not automatically realized. It requires deliberate and strategic investments in human capital, particularly in equipping young people with the skills, opportunities, and networks needed to participate meaningfully in governance and development processes.

In many African countries, including Liberia, Kenya, Ghana, Sierra Leone, and Malawi, young leaders often face significant barriers to engaging in the public sector. Despite their energy, innovation, and adaptability, they are frequently excluded from leadership pipelines, decision-making platforms, and policy design spaces (African Development Bank, 2020). This exclusion not only limits individual

career trajectories but also deprives public institutions of the fresh perspectives, digital competencies, and reform-minded approaches that young professionals can bring. As a result, public service systems risk stagnation, slow responsiveness, and weak citizen engagement-factors that undermine inclusive governance.

Recognizing these challenges, continental policy frameworks such as the African Union's Agenda 2063 and the Malawi 2063 Vision have placed youth empowerment and leadership at the core of national and regional development strategies (African Union Commission, 2015; Government of Malawi, 2020). These frameworks emphasize that achieving effective, accountable, and citizen-centric governance requires a generational shift in leadership-where young, ethical, and agile leaders are deliberately cultivated to drive public sector transformation.

It is against this backdrop that the Emerging Public Leaders (EPL) Fellowship Program operates. The program recruits, trains, and places highly talented young professionals into strategic positions within government ministries, departments, and agencies. Through experiential learning, mentorship, and structured leadership development, the program seeks to address a critical gap identified in many African public service systems: the absence of sustained pathways for youth to transition into positions of influence and contribute to systemic reform.

This paper examines the EPL Public Service Fellowship model as implemented in five operational countries: Liberia, Kenya, Ghana, Sierra Leone, and Malawi. It explores how structured fellowship programs can serve as a catalytic strategy for leveraging the demographic dividend through youth empowerment, in line with the African Union's vision for responsive, agile, and citizen-focused public administration. By integrating qualitative and quantitative evidence from multiple contexts, the paper contributes to the growing discourse on how Africa can strategically position its youth not merely as beneficiaries of governance reforms, but as active drivers of public sector innovation and institutional accountability.

Context and Background

The Demographic Dividend in Africa

The term *demographic dividend* refers to the economic growth potential that arises from changes in a population's age structure, particularly when the working-age population (15-64 years) becomes proportionally larger than the non-working-age groups (children and elderly) (Bloom, Canning, and Sevilla, 2003). For Africa, the demographic transition is occurring at an unprecedented scale. The African Union (2017) notes that over 60 percent of Africa's population is

under the age of 25, and by 2050, the continent's youth population is projected to double, reaching over 830 million. This youthful demographic profile offers a unique window of opportunity to accelerate economic transformation, innovation, and governance reforms.

However, the demographic dividend is not an automatic outcome. Without deliberate investments in education, skills development, health, and governance systems, the “youth bulge” could become a liability rather than an asset (United Nations Economic Commission for Africa, 2019). High levels of youth unemployment, underemployment, and exclusion from decision-making processes risk generating socio-economic instability and undermining development gains.

Youth Participation in Governance and Public Service

Youth engagement in public administration remains limited across many African countries despite the presence of policy frameworks that promote inclusivity. The African Charter on Youth (African Union, 2006) calls for the active participation of young people in all spheres of society, including governance and public service. Yet practical pathways for youth to transition into leadership roles within government institutions remain scarce. Factors such as entrenched bureaucratic hierarchies, lack of mentorship, and perceptions of inexperience contribute to the marginalization of youth in decision-making spaces (Osei-Akoto et al., 2020).

In countries such as Liberia, Kenya, Ghana, Sierra Leone, and Malawi, young professionals often face structural barriers to entry into public service careers. Even when they are recruited, they are frequently assigned low-responsibility roles with limited scope for influence. This underutilization of young talent hinders institutional agility and limits the adoption of innovative approaches to public service delivery.

The Policy Environment

Over the past decade, continental and national policy agendas have recognized the centrality of youth empowerment to Africa's development. The African Union's Agenda 2063 outlines a vision of “an Africa whose development is people-driven, relying on the potential offered by African people, especially its women and youth” (African Union Commission, 2015: 6). Similarly, the AU Roadmap on Harnessing the Demographic Dividend (African Union, 2017) emphasizes four key pillars: employment and entrepreneurship, education and skills development, health and well-being, and rights, governance, and youth empowerment.

At the national level, each of the EPL operational countries has developed strategic plans that prioritize youth leadership. For instance, Malawi's Malawi 2063 Vision envisions "an inclusively wealthy and self-reliant nation" built on effective governance and youth participation in leadership and entrepreneurship (Government of Malawi, 2020). Kenya's Vision 2030, Ghana's Coordinated Programme of Economic and Social Development Policies, and Sierra Leone's Medium-Term National Development Plan similarly highlight the role of youth in driving governance and socio-economic transformation.

Despite these policy commitments, the translation of youth empowerment strategies into tangible pathways within the public sector remains uneven. Many governments have yet to institutionalize structured entry points for youth leadership in public administration. This gap presents both a challenge and an opportunity for innovative models like the Emerging Public Leaders Public Sector Fellowship Program.

The Emerging Public Leaders' Public Service Fellowship Program Model

The Public Service Fellowship Program is a multi-country initiative hosted by Emerging Public Leaders (EPL) and is designed to strengthen public institutions by infusing them with a new generation of talented, ethical, and agile young leaders. EPL network has become a prominent pioneer of this model. Through programs such as:

1. The Public Service Fellowship Program (PSFP) in Malawi, Sierra Leone and Ghana,
2. The Public Service Emerging Leaders Fellowship (PSELF) in Kenya, and
3. Similar programs like the Presidential Young Professionals Program (PYPP) in Liberia.

The EPL Fellowship Program addresses the identified gap between policy commitments to youth empowerment and the reality of limited opportunities for meaningful youth engagement in public service. It does so by recruiting outstanding young graduates, providing intensive leadership and ethics training, strengthening their community service and local governance skills, and placing them in roles within government ministries, departments, and agencies for a one-year fellowship period.

By operating in these diverse governance contexts: Liberia, Kenya, Ghana, Sierra Leone, and Malawi, the EPL model generates cross-country learning on how

youth can effectively contribute to policy design, service delivery, and institutional reform. In each country, the program adapts to local political and administrative environments while maintaining core principles of merit-based recruitment, values-driven leadership, and continuous professional development (EPL, 2023).

Insights from EPL Evaluations

Evaluation evidence underscores the relevance and effectiveness of the fellowship model.

1. From the Kenya PSELF evaluation (2024): Fellows reported enhanced confidence, leadership skills, and networks. Host ministries acknowledged contributions in project coordination, policy analysis, and citizen service improvements. However, sustainability was flagged as a concern, with recommendations to deepen government ownership and alumni engagement.

2. From Liberia, Ghana and Malawi PSFP mid-term evaluation (2024): The program demonstrated strong recruitment and training systems, with fellows placed in ministries aligned with national priorities. Positive contributions included strengthening decentralization processes, supporting policy design, and enhancing monitoring frameworks. Challenges included uneven support from host institutions and resource constraints for mentorship and learning.

3. From the cross-country EPL impact evaluation (2024): The fellowship model was found to be highly relevant across contexts, addressing a shared challenge of limited youth pathways into governance. Alumni trajectories revealed growing influence in public and private leadership spaces, with many fellows transitioning into permanent government roles. Persistent challenges included sustainability beyond donor support, limited digital capacity-building, and the need for systemic institutional reforms to complement fellowship interventions.

These findings highlight the fellowship model as a promising mechanism for bridging the gap between Africa's youthful population and its governance systems.

Positioning the Fellowship Model in Policy and Scholarly Discourse

The EPL fellowship programs align with broader theoretical and policy discourses on youth empowerment and governance transformation. Scholarly literature suggests that when youth are integrated into governance, institutions benefit from innovation, agility, and closer alignment with citizen needs (Kumar & Franz, 2020; McKinsey & Company, 2021). At the same time, policy frameworks such as

CEPA's principles of effectiveness, accountability, and inclusivity provide a normative basis for youth integration into public administration (United Nations, 2020).

By combining structured recruitment, capacity-building, mentorship, and institutional embedding, the PSFP and PSELF respond directly to the structural barriers identified earlier. They represent a shift from rhetoric about youth empowerment to concrete mechanisms for leadership pipeline development.

Towards a Scalable Model for Africa

The demographic dividend window is finite; projections suggest that Africa has only a few decades to fully harness it before population ageing begins to offset its potential benefits (United Nations, 2022). Fellowship models such as EPL's PSFP and PSELF demonstrate that structured, merit-based pathways can play a critical role in building ethical, transformative, and citizen-centered leaders for Africa's governance systems. The challenge now lies in scaling and contextualizing this model across countries, embedding it within national institutions, and ensuring its sustainability beyond donor funding.

Literature Review

Youth Empowerment and the Demographic Dividend

The concept of the demographic dividend has gained traction in policy and scholarly discourse as a potential driver of Africa's socio-economic transformation. Defined as the accelerated growth that can result when the share of a working-age population rises relative to dependents, the dividend is not automatic but depends on investments in education, health, employment, and governance (African Union, 2017; Bloom, Kuhn, & Prettnner, 2017).

Studies highlight that governance institutions play a decisive role in whether the demographic dividend is realized or squandered (World Bank, 2022). Without inclusive and effective public sectors, even large cohorts of skilled youth may remain underemployed, disconnected from decision-making, or vulnerable to disillusionment and instability (ILO, 2020). Youth empowerment, therefore, is not only about labour markets but also about leadership opportunities in public administration and governance.

Fellowship Models as Leadership Pipelines

Fellowship models have long been used globally as pathways to prepare young leaders for public service. Programs such as the U.S. Presidential Management Fellowship, the UK's Civil Service Fast Stream, and similar initiatives in Asia and Latin America provide structured recruitment, training, and mentorship to cultivate early-career talent (Kumar & Franz, 2020).

In Africa, fellowship programs are less widespread but growing. They represent a strategic response to the twin challenges of youth underrepresentation in governance and declining institutional capacity. By embedding fellows directly into ministries and agencies, these programs bridge theory and practice, enabling youth to contribute to policy formulation, project implementation, and institutional reforms

Evidence from the EPL Fellowship Model

The Emerging Public Leaders (EPL) network contributes to this literature by demonstrating a scalable model for Africa.

1. PSELF (Kenya): Evaluation evidence shows fellows enhanced their policy analysis, leadership, and communication skills. Ministries reported increased efficiency in project delivery and policy drafting. The evaluation also highlighted challenges of sustainability and the need for stronger government buy-in (EPL, 2024a).

2. PSFP (Liberia, Ghana and Malawi): The mid-term reviews documented fellows' contributions to decentralization reforms, public financial management improvements, and enhanced data systems. However, it also identified uneven institutional support and the need for stronger mentorship and monitoring frameworks (EPL, 2024b).

3. Cross-country EPL Impact Evaluation: Across multiple operational countries, fellows were found to strengthen citizen-centered service delivery, foster innovation, and embody ethical leadership. Alumni were increasingly moving into senior public service roles. The review, however, stressed sustainability challenges, limited resources for alumni networks, and the importance of embedding digital and adaptive leadership training (EPL, 2024c).

These evaluations confirm what the literature suggests: fellowship models are effective in addressing entry barriers, but they require systemic integration to ensure long-term sustainability and impact.

Gaps in the Literature and Contribution of this Paper

While there is growing research on youth in governance, three key gaps remain:

1. Limited empirical studies from Africa: Much of the scholarship draws on experiences from North America and Europe, with relatively little evidence from African contexts.

2. Weak integration of evaluation findings: Existing studies often focus on descriptive accounts rather than systematic assessments of fellowship effectiveness.

3. Scalability debates: There is limited analysis of how fellowship models can be scaled sustainably across diverse governance contexts.

This paper contributes to filling these gaps by drawing on evaluation evidence from PSELF Impact Report (Kenya), PSFP Mid-term Evaluation Report (Malawi, Ghana, Liberia), and the cross-country EPL programs Impact Evaluation Report, situating it within broader scholarly debates, and proposing a framework for scaling the model across Africa.

Methodology

Research Design

This paper adopts a desk-based research design utilizing a structured literature review approach. The purpose of this methodology is to synthesize existing evidence from both internal program documentation and external literature to assess how the EPL Public Service Fellowship Program (PSFP) contributes to leveraging the demographic dividend through youth empowerment.

A structured literature review was selected to allow for a systematic, transparent, and replicable process for identifying, evaluating, and synthesizing relevant evidence. This approach ensured that the discussion is grounded in both empirical program data and broader scholarly and policy debates on youth leadership, governance, and public sector reform.

Data Sources

Two primary categories of secondary data were reviewed:

- Internal EPL Program Documents-Including the PSELF Impact Evaluation Report (2024), PSFP Mid-Term Evaluation Report (2025), EPL cross country Impact Report (2024), EPL Strategic Plan (2023-2025), monitoring and evaluation reports, program design documents, and official program descriptions from

EPL's public platforms. These provided detailed insights into the program's theory of change, operational model, and emerging outcomes across five operational countries -Liberia, Ghana, Sierra Leone, Kenya and Malawi.

- External Scholarly and Policy Literature-Peer-reviewed journal articles, reports from international organizations (e.g., African Union, UNDP, World Bank), and policy briefs addressing the demographic dividend, youth empowerment, public sector capacity building, and governance transformation in Africa.

Data Collection and Review Process

The analysis employed a structured literature review framework, following these steps:

- 1. Identification:** Systematically selecting internal and external documents relevant to youth empowerment, public sector fellowships and the demographic dividend in Africa.

- 2. Screening:** Prioritising high-quality, relevant, and recent sources, with a focus on evaluation data from EPL programs.

- 3. Thematic Analysis:** Coding findings into thematic categories such as *relevance, effectiveness, institutional impact, sustainability, and scalability*.

- 4. Comparative Review:** Juxtaposing evidence from EPL's operational countries; Liberia, Kenya, Ghana, Malawi, and Sierra Leone contexts to identify commonalities, divergences, and lessons.

This framework allowed for a coherent synthesis of findings, highlighting both program-specific insights and broader trends.

Data Analysis Approach

The collected data were analysed through qualitative thematic analysis and comparative review:

Qualitative Thematic Analysis: Emerging themes were identified across internal and external sources, guided by the paper's research objectives.

Comparative Review: Findings from EPL program documentation were compared with trends, recommendations, and lessons from external literature to assess alignment, gaps, and innovations.

Limitations and Potential Bias

Because the primary data sources were internal program evaluations commissioned or authored for EPL, there is potential for positive reporting bias,

particularly in the interpretation of program outcomes and success indicators. To mitigate this, three measures were taken:

1. Triangulating findings across multiple reports produced at different stages (mid-term, end-line, and cross-country).

2. Comparing internal conclusions with independent external studies and publicly available governance indicators.

3. Distinguishing clearly between empirically verified outcomes (as documented in evaluations) and aspirational or theoretical projections discussed in the literature and policy frameworks.

Ethical Considerations

As the study is based entirely on secondary data, it did not involve direct engagement with human participants. Nonetheless, all sources were acknowledged through proper citation, and care was taken to ensure accurate representation of original authors' ideas.

Findings And Discussion

The analysis of internal EPL documentation and external literature reveals that the Public Service Fellowship Program (PSFP) is contributing in tangible ways to addressing the structural and skills-related barriers faced by young leaders in public service. The program's design and implementation show a clear alignment with the goal of harnessing the demographic dividend by equipping youth with the skills, networks, and leadership capacities required to influence governance systems.

Relevance of the Fellowship Model

The evaluations consistently highlight the strong relevance of the fellowship model to Africa's governance and demographic realities. Across contexts, fellows are recruited into ministries and agencies that align with national development priorities, including decentralisation, financial management, and service delivery (EPL, 2024a; EPL, 2024b). By targeting recent graduates with demonstrated leadership potential, the programs directly respond to the problem of limited youth entry pathways into governance.

This relevance is reinforced by continental frameworks such as Agenda 2063, which calls for inclusive and accountable institutions, and the SDGs, particularly Goal 16 on effective, accountable, and inclusive institutions. In Kenya, the PSELF

was seen as filling a critical gap in structured youth recruitment, while in Malawi, the PSFP aligned with national public sector reform efforts. The cross-country evaluation confirmed that relevance is a defining strength of EPL programs, helping position them as credible partners for governments (EPL, 2024c).

Effectiveness in Building Youth Leadership

The evaluations provide strong evidence that fellows acquire significant skills and professional growth. In Kenya, PSELF fellows reported enhanced confidence, policy analysis skills, and ability to coordinate cross-departmental initiatives (EPL, 2024a). Malawi's PSFP fellows similarly demonstrated capacity gains, contributing to data systems, drafting policy briefs, and supporting decentralization reforms (EPL, 2024b).

The cross-country evaluation confirmed that fellows consistently improved their leadership competencies, communication, and ethical awareness. Alumni trajectories further validate this effectiveness: many transitioned into senior roles in government or allied institutions, illustrating the fellowship's catalytic role in shaping career pathways (EPL, 2024c).

These findings resonate with wider literature, which notes that structured training, mentorship, and experiential learning are critical for preparing youth for leadership in complex governance environments (Kumar & Franz, 2020; UNDP, 2021).

Institutional Impact

While the primary focus of the fellowship model is on fellows' development, evaluations show notable institutional benefits. Ministries and agencies hosting fellows reported improved efficiency, innovation in project delivery, and stronger policy analysis capacities (EPL, 2024a; EPL, 2024b). For example, in Malawi, fellows contributed to enhancing monitoring and evaluation frameworks in line ministries. In Kenya, fellows were credited with strengthening communication between government and citizens, particularly in digitised service delivery contexts.

The cross-country evaluation found that fellows often acted as change agents, introducing fresh perspectives and digital competencies into bureaucracies. However, institutional impact varied significantly depending on the degree of host institution support. Where supervisors and colleagues actively engaged fellows, the contributions were more visible and sustained.

Programmatic Results Across Countries

Country	Program	Key Sectors of Placement	Fellows Trained	% Retained in Institution of Placement	Illustrative Institutional Contributions
Liberia	Presidential Young Professionals Programme (PYPP)	Civil Service, Education, Health, Finance	285	63%	Fellows led policy reviews on teacher payroll verification and digital records reforms within Civil Service Agency and Ministry of Education. 100% of Liberian employers rated training quality as satisfactory or better. 56.8% reported institutional benefits such as improved practices and culture due to fellow contributions.
Kenya	Public Service Emerging Leaders Fellowship Programme (PSELF)	Interior/correctional, Education, Health,	112	71%	In Correctional Services, fellows introduced anti-corruption protocols that reduced case processing times by 42%. Health sector improvement in emergency response through enhanced cross-county coordination. Education ministry cut paperwork by 57% via digital transformation. Across ministries, service delivery gains ranged from 31% to 75%, highlighting PSELF's systemic impact.

Ghana	Public Service Fellowship Programme (PSFP)	ICT, Finance, Local Government	185	40%	Supported implementation of the Digital Ghana agenda and SDG co-ordination frameworks under National Development Planning Commission.
Malawi	Public Service Fellowship Programme (PSFP)	Health, Agriculture, Education, Security, Local Government, ICT, Civil Service	79	33%	Fellows supported the rollout of digital data management systems and promoted gender-responsive budgeting tools. 100% of employers in Malawi rated the training quality positively, and 56.3% reported moderate or significant institutional changes from fellows' input.

Table 1. Summary of EPL Fellowship Outcomes by Country.

Source: Compiled from EPL (2024a, 2024b, 2024c) evaluation reports and program summaries.

Narrative Explanation

Across all countries, fellows were placed in ministries, departments and agencies aligned with national development priorities. The average retention rate of 33-71% reflects both the quality of training and government willingness to absorb fellows into permanent roles. Sectoral impacts were most visible in data management reforms, policy design, and digital governance initiatives; areas where young professionals applied analytical and adaptive leadership skills.

These measurable outcomes demonstrate the fellowship's contribution to institutional strengthening and human capital renewal in the public service, while variations across countries reflect differing levels of host government engagement and absorption capacity.

Sustainability Challenges

Sustainability emerged as a recurrent challenge across all evaluations. The fellowship programs remain heavily reliant on donor funding, with limited domestic resource mobilization. In Kenya, sustainability concerns were linked to uncertain government budgetary commitments and the absence of institutionalized recruitment frameworks (EPL, 2024a; EPL, 2024b).

The cross-country evaluation stressed the need for greater government ownership, including integrating fellow recruitment into civil service systems, building stronger alumni networks, and diversifying funding streams (EPL, 2024c). Without these measures, the risk is that the fellowship remains a project rather than an institutionalized pathway.

Lessons Learned and Best Practices

The evaluations and broader literature point to several lessons and best practices:

1. Structured mentorship is critical: Fellows thrive where supervisors provide regular guidance, underscoring the need for systematic mentorship frameworks.

2. Government buy-in enhances impact: Ministries that view fellows as integral contributors create better environments for skills transfer and institutional change.

3. Alumni engagement sustains outcomes: Building alumni networks strengthens program impact by creating communities of practice beyond the fellowship term.

4. Digital and adaptive skills matter: Fellows' ability to leverage technology and agile approaches has proven valuable in enhancing service delivery.

5. Contextual adaptation is essential: While the fellowship model is replicable, adaptations to national governance contexts are necessary for maximum effectiveness.

Discussion

Taken together, the findings demonstrate that EPL's fellowship programs are both relevant and effective in building transformative youth leadership and contributing to institutional performance. They respond directly to the structural barriers that prevent youth participation in governance, offering a model that can be scaled across Africa.

However, sustainability challenges highlight the importance of systemic reforms. Without embedding fellowships into national civil service systems and securing long-term government financing, their impact risks being transient. The broader literature confirms that youth empowerment programs succeed when institutionalised, resourced, and linked to long-term leadership pipelines (Resnick & Casale, 2014; McKinsey & Company, 2021).

The fellowship model, therefore, offers a valuable entry point into governance reform, but its future lies in transitioning from donor-driven projects to nationally owned institutions.

Conclusion

Evidence from internal EPL evaluations and external literature confirms that the Public Service Fellowship Program (PSFP) is an effective model for leveraging Africa's demographic dividend through structured youth empowerment in public service. By creating entry pathways for young leaders, building their technical and ethical competencies, and embedding them in key government institutions, the fellowship addresses long-standing barriers to youth participation in governance.

Across EPL's operational countries; Liberia, Ghana, Sierra Leone, Kenya, and Malawi, the fellowship has yielded measurable results, including 33-71% retention rates of fellows in public service and tangible institutional improvements in policy formulation, data systems, and digital governance (EPL, 2024a; 2024b; 2024c). These outcomes demonstrate that deliberate youth integration enhances institutional agility and accountability.

At the same time, the program aspires to foster a generation of transformative and ethical public leaders capable of shaping inclusive, citizen-centered governance across Africa. Its alignment with Agenda 2063, the SDGs, and UN CEPA principles reinforces its strategic policy relevance. To sustain these gains, future efforts should prioritise domestic financing, institutional integration, and stronger alumni systems.

In sum, the PSFP exemplifies how targeted youth empowerment can translate demographic potential into governance innovation, offering a scalable model for reform-oriented public service transformation across the continent.

Recommendations

Drawing from lessons learned and best practices, the following recommendations are proposed to strengthen and scale the PSFP model:

1. Deepen Strategic Institutional Partnerships for resource mobilization

Engage national governments, donor agencies, and private sector actors to secure long-term funding and technical support for program implementation.

2. Integrate Digital Competency Development

Expand training modules to include advanced digital governance skills, enabling fellows to drive innovation and efficiency in line with agile public administration priorities.

3. Embed Impact Measurement and Knowledge Sharing

Establish a continental learning platform for sharing data, case studies, and innovations from each country's program, enabling cross-country learning and continuous improvement.

4. Scale Through Regional Collaboration

Explore partnerships with regional governance bodies, academic institutions, and development partners to replicate the PSFP model in additional African countries while adapting to local contexts.

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Mekânsal Panel Ekonometrik Analiz ile Afrika’da Sürdürülebilir ve Kapsayıcı Büyüme Dinamikleri: Yapay Zekâ, Hava Kirliliği ve Mobil Aboneliklerin Rolü

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Özet

Bu çalışma, 1996-2024 döneminde dokuz Afrika ülkesinde ekonomik büyüme oranları üzerindeki mekânsal yayılma etkilerini mekânsal panel veri modelleri kullanarak incelemektedir. Bağımlı değişken olarak Gayri Safi Yurtiçi Hasi-la büyüme oranının logaritması ($\ln gdp$) alınmış, açıklayıcı değişkenler arasında yapay zekâ bilimsel yayınları ($\ln ai$), yıllık ortalama PM2.5 hava kirliliği maruziyeti ($\ln airp$) ve mobil hücresel abonelik sayısı ($\ln mcs$) yer almaktadır. Global Moran’s I testi ile mekânsal bağımlılığın varlığı doğrulanmış ve mekânsal yayılma etkisinin istatistiksel olarak anlamlı olduğu tespit edilmiştir. Klasik En Küçük Kareler (OLS), Mekânsal Lag (SAR) ve Mekânsal Hata (SEM) modellerinin karşılaştırılması sonucunda, SAR modelinin bölgedeki ekonomik büyüme oranlarının mekânsal dinamiklerini en iyi şekilde açıkladığı belirlenmiştir. Elde edilen bulgular, Afrika’da sürdürülebilir kalkınma politikalarının mekânsal etkileşimler dikkate alınarak şekillendirilmesinin önemini vurgulamaktadır.

Anahtar Kelimeler: Mekânsal Yayılma, Ekonomik Büyüme, Afrika, Yapay Zekâ, Hava Kirliliği

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Giriş

Afrika kıtası, ekonomik büyüme ve kalkınma açısından hem büyük fırsatlar hem de önemli zorluklar barındırmaktadır. 21. yüzyılın başından itibaren Afrika ekonomileri, küresel ekonomik sistemde artan bir rol oynamaya başlamış ve 2000-2014 döneminde ortalama %5'lik büyüme oranlarıyla dünyanın en hızlı büyüyen bölgelerinden biri haline gelmiştir (African Development Bank, 2020; World Bank, 2022). Ancak bu büyüme performansı, ülkeler ve bölgeler arasında heterojen bir dağılım göstermekte ve sürdürülebilirlik açısından önemli sorular ortaya çıkarmaktadır (Calderón vd., 2022). Sürdürülebilir ve kapsayıcı büyüme hedefleri doğrultusunda, teknolojik gelişmeler, çevresel faktörler ve altyapı yatırımları kritik öneme sahiptir (African Development Bank, 2020; World Bank, 2022).

Afrika'nın ekonomik dönüşüm sürecinde karşılaştığı temel zorluklar arasında düşük teknolojik kapasite, yetersiz altyapı, çevresel bozulma ve kurumsal zayıflıklar yer almaktadır (UNDP, 2024). Birleşmiş Milletler Sürdürülebilir Kalkınma Amaçları (SDGs) çerçevesinde, kıtanın 2030 yılına kadar kapsayıcı ve sürdürülebilir ekonomik büyüme sağlaması, yoksulluğu azaltması ve çevresel sürdürülebilirliği güçlendirmesi beklenmektedir (UNDP, 2024). Bu bağlamda, teknolojik yenilikler ve dijital dönüşüm, Afrika'nın kalkınma yörüngesini değiştirme potansiyeline sahip kritik faktörler olarak öne çıkmaktadır (OECD, 2021; Acemoglu & Restrepo, 2019).

Yapay zekâ (AI) ve dijitalleşme, ekonomik dönüşümün itici güçleri olarak öne çıkarken, hava kirliliği gibi çevresel sorunlar büyüme dinamiklerini olumsuz etkileyebilmektedir (OECD, 2021; UNDP, 2024). Acemoglu ve Restrepo (2019), yapay zekâ teknolojilerinin işgücü piyasalarını ve üretim süreçlerini dönüştürerek ekonomik büyümeyi etkilediğini, ancak bu etkinin ülkelerin teknolojik hazırlık düzeylerine bağlı olarak farklılaştığını göstermiştir. Afrika bağlamında, OECD (2021) yapay zekâ alanındaki bilimsel üretimin ve teknolojik adaptasyonun sınırlı olduğunu, bu durumun kıtanın küresel dijital ekonomiye entegrasyonunu geciktirdiğini belirtmiştir. Bununla birlikte, son yıllarda Afrika ülkelerinde yapay zekâ araştırmalarında ve uygulamalarında artış gözlemlenmekte, bu da gelecekteki büyüme potansiyelini artırmaktadır (OECD, 2021).

Çevresel sürdürülebilirlik, Afrika'nın uzun vadeli ekonomik büyümesi için kritik bir faktördür. Hava kirliliği, özellikle PM2.5 partikülleri hem insan sağlığı hem de ekonomik verimlilik üzerinde olumsuz etkiler yaratmaktadır (Calderon vd., 2022). Dünya Bankası raporlarına (World Bank, 2022; Calderon vd., 2022) göre, Afrika'da hızlı kentleşme ve sanayileşme süreçleri hava kirliliğini artırmakta,

bu durum sağlık harcamalarını yükseltmekte ve işgücü verimliliğini düşürmektedir. Calderon vd. (2022), hava kirliliğinin ekonomik faaliyetlerin yoğun olduğu bölgelerde arttığını ancak sürdürülebilir büyüme için çevresel risklerin azaltılması gerektiğini vurgulamaktadır. Bu nedenle, ekonomik büyüme ve çevresel kalite arasındaki ilişkinin anlaşılması, politika yapıcılar için öncelikli bir konu haline gelmiştir (UNDP, 2024; Calderon vd., 2022).

Ayrıca, mobil teknolojilerin yaygınlaşması ekonomik kapsayıcılığı artırma potansiyeline sahiptir (GSMA, 2022). GSMA (2022) raporuna göre, Sahra-altı Afrika'da mobil abone sayısı 2022 yılında 500 milyonu aşmış ve mobil internet penetrasyonu hızla artmaktadır. Mobil teknolojiler, finansal hizmetlere erişim (mobil bankacılık), e-ticaret, dijital eğitim ve sağlık hizmetleri gibi alanlarda dönüşüm yaratarak ekonomik kapsayıcılığı güçlendirmektedir. Ancak, mobil altyapının ekonomik büyüme üzerindeki etkisinin ampirik olarak belirlenmesi, literatürde henüz netleşmemiş bir konudur (GSMA, 2022; Baltagi, 2021). Bu çalışma, mobil aboneliklerin ekonomik büyüme üzerindeki etkisini mekânsal bağlamda inceleyerek bu boşluğu doldurmayı amaçlamaktadır.

Mekânsal panel ekonometrik modeller, zaman ve mekânsal boyutları birlikte ele alarak bölgeler arası etkileşimleri ve mekânsal bağımlılıkları daha doğru analiz etme imkânı sunmaktadır (Elhorst, 2014; Baltagi, 2021). Geleneksel ekonometrik modeller, gözlemlerin bağımsız olduğu varsayımına dayanmakta, ancak ekonomik büyüme gibi fenomenler coğrafi olarak birbirine bağlı olabilmektedir (Anselin, 1988; LeSage & Pace, 2009). Anselin (1988) ve LeSage ve Pace (2009), mekânsal bağımlılığın göz ardı edilmesinin model sonuçlarını yanıltabileceğini ve sapmalı tahminlere yol açabileceğini göstermiştir. Elhorst (2014), mekânsal panel modellerin zamansal ve mekânsal etkileri birlikte ele alarak daha doğru ve güvenilir sonuçlar verdiğini ortaya koymuştur. Afrika bağlamında, ülkeler arasındaki ticaret, göç, teknoloji transferi ve sınır ötesi yatırımlar gibi mekânsal etkileşimler, ekonomik büyümenin mekânsal yayılımını güçlendirmektedir (Getis, 2008; AfCFTA, 2021; UNCTAD, 2022).

Bu çalışma, 1996-2024 yılları arasında 9 Afrika ülkesine ait panel veri kullanılarak, ekonomik büyümenin mekânsal yayılımını yapay zekâ, hava kirliliği ve mobil abonelikler üzerinden analiz etmektedir. Çalışmanın temel araştırma soruları şunlardır: (i) Afrika ülkelerinde ekonomik büyüme oranları mekânsal olarak birbirine bağlı mıdır? (ii) Yapay zekâ bilimsel üretimi, hava kirliliği ve mobil abonelikler ekonomik büyümeyi nasıl etkilemektedir? (iii) Mekânsal bağımlılık dikkate alındığında, bu etkilerin büyüklüğü ve yönü nasıl değişmektedir? Bu

sorulara yanıt vermek için, Global Moran's I testi ile mekânsal bağımlılık test edilmiş, ardından klasik OLS, mekânsal lag (SAR) ve mekânsal hata (SEM) modelleri karşılaştırılmıştır (Elhorst, 2014; Anselin, 1988; LeSage & Pace, 2009; Moran, 1950). Böylece, sürdürülebilir ve kapsayıcı büyüme için politika önerileri geliştirilmesi amaçlanmaktadır.

Çalışmada, klasik En Küçük Kareler (OLS) modeli ile mekânsal lag (SAR) ve mekânsal hata (SEM) modelleri karşılaştırılarak, Afrika ülkelerindeki ekonomik büyüme oranlarının mekânsal dinamiklerini en iyi açıklayan model belirlenmiştir. Bu karşılaştırma, mekânsal ekonometri literatüründe önerilen model seçim kriterlerine (Log-likelihood, AIC, BIC, Pseudo R²) dayanmaktadır (Elhorst, 2014; LeSage & Pace, 2009).

Elde edilen bulgular, Afrika'da ekonomik büyüme politikalarının mekânsal etkileşimler dikkate alınarak şekillendirilmesinin sürdürülebilir kalkınma açısından önemini ortaya koymaktadır. Ayrıca, çalışma Afrika Kıtasal Serbest Ticaret Bölgesi (AfCFTA) gibi bölgesel entegrasyon girişimlerinin mekânsal yayılım etkilerini güçlendirme potansiyelini vurgulamaktadır (AfCFTA, 2021; UNCTAD, 2022).

Çalışmanın literatüre katkıları şu şekilde özetlenebilir: Birincisi, Afrika ülkelerinde ekonomik büyümenin mekânsal yayılımını yapay zekâ, hava kirliliği ve mobil abonelikler gibi çağdaş faktörlerle birlikte inceleyen ilk çalışmalardan biridir. İkincisi, mekânsal panel ekonometrik modellerin Afrika bağlamında uygulanması, bölgesel kalkınma politikalarının mekânsal boyutunun önemini ampirik olarak ortaya koymaktadır. Üçüncüsü, 1996-2024 gibi uzun bir zaman dilimini kapsayan panel veri seti, teknolojik ve çevresel değişimlerin uzun vadeli etkilerinin anlaşılmasına olanak tanımaktadır (World Bank, 2022; OECD, 2021; GSMA, 2022).

Literatür Taraması

Ekonomik büyüme teorisi, Adam Smith'in "Ulusların Zenginliği" (1776) eserinden bu yana iktisat literatürünün merkezinde yer almaktadır. Neoklasik büyüme teorisi, Solow (1956) ve Swan (1956) tarafından geliştirilerek sermaye birikimi, işgücü ve teknolojik ilerlemenin büyüme üzerindeki rolünü vurgulamıştır. Ancak, içsel büyüme teorileri (Romer, 1990; Lucas, 1988) teknolojik yeniliklerin, beşeri sermayenin ve bilgi birikiminin içsel faktörler olarak büyümeyi sürdürdüğünü göstermiştir. Afrika bağlamında, bu teorik çerçeveler, kıtanın düşük büyüme performansını açıklamak ve politika önerileri geliştirmek için sıklıkla kullanılmaktadır (African Development Bank [AfDB], 2020; World Bank, 2022; Calderon vd., 2022).

Sürdürülebilir ekonomik büyüme ve kapsayıcılık alanında yapılan çalışmalar, teknolojik gelişmelerin büyüme üzerindeki etkisini giderek daha fazla vurgulamaktadır. Brynjolfsson ve McAfee (2014), dijital teknolojilerin ekonomik yapıyı dönüştürdüğünü ve üretkenlik artışlarına yol açtığını, ancak bu sürecin eşitsizlikleri artırma riski taşıdığını belirtmiştir. Acemoglu ve Restrepo (2019), yapay zekâ ve otomasyonun işgücü piyasası ve ekonomik büyüme üzerindeki karmaşık etkilerini detaylandırmış, teknolojik adaptasyonun büyüme için kritik olduğunu belirtmiştir. Onlar yapay zekânın işgücünü ikame etme ve tamamlama etkilerini ayırt ederek, teknolojik değişimin net etkisinin ülkelerin kurumsal ve beşerî sermaye kapasitelerine bağlı olduğunu göstermiştir. Afrika özelinde, OECD (2021) raporuna göre yapay zekâ alanındaki bilimsel üretimin sınırlı olduğunu ve dijitalleşmenin ekonomik dönüşümde önemli bir rol oynadığını raporlamıştır. Rapora göre, Afrika'da yapay zekâ araştırmalarının küresel payı %1'in altında kalmakta, bu durum kıtanın teknolojik açığını derinleştirmektedir. Ancak, Güney Afrika, Kenya ve Nijerya gibi ülkelerde yapay zekâ ekosistemlerinin gelişmeye başlaması, gelecek için umut verici sinyaller sunmaktadır.

Teknolojik yayılma (*technology diffusion*) literatürü, yeni teknolojilerin coğrafi olarak nasıl yayıldığını ve ekonomik büyümeyi nasıl etkilediğini incelemektedir. Keller (2004), teknoloji yayılımının uluslararası ticaret, doğrudan yabancı yatırımlar ve bilgi akışları yoluyla gerçekleştiğini göstermiştir. Afrika bağlamında, teknoloji yayılımı sınırlı kalmakta ve bu durum büyüme potansiyelini kısıtlamaktadır (African Development Bank [AfDB], 2020; OECD, 2021). Mekânsal ekonometrik modeller, teknoloji yayılımının coğrafi boyutunu analiz etmek için güçlü araçlar sunmaktadır (Elhorst, 2014; Anselin, 1988; LeSage & Pace, 2009).

Çevresel faktörler, özellikle hava kirliliği, ekonomik büyüme ile ilişkili olarak karmaşık etkiler göstermektedir. Calderon vd. (2022), hava kirliliğinin ekonomik faaliyetlerin yoğun olduğu bölgelerde arttığını ancak sürdürülebilir büyüme için çevresel risklerin azaltılması gerektiğini vurgulamaktadır. Çevresel Kuznets Eğrisi (EKC) hipotezi, ekonomik büyümenin başlangıç aşamalarında çevresel bozulmanın arttığını, ancak belirli bir gelir düzeyinden sonra azaldığını öne sürmektedir (Grossman & Krueger, 1995). Grossman ve Krueger (1995), bu hipotezi ampirik olarak test etmiş ve gelişmiş ülkelerde EKC'nin geçerli olduğunu göstermiştir. Ancak, Afrika ülkelerinde bu ilişkinin geçerliliği tartışmalıdır (Calderon vd., 2022; Stern, 2004). Stern (2004), EKC hipotezinin metodolojik sorunlar içerdiğini ve gelişmekte olan ülkelerde çevresel politikaların etkinliğinin sınırlı olduğunu belirtmiştir. Dünya Bankası raporları (World Bank, 2022; Calderon vd., 2022),

Afrika'da hava kirliliğinin sağlık ve ekonomik maliyetlerinin yüksek olduğunu ve acil politika müdahalelerine ihtiyaç duyulduğunu vurgulamaktadır.

Hava kirliliği ve ekonomik büyüme arasındaki ilişkiyi inceleyen ampirik çalışmalar, karmaşık ve çift yönlü bir nedensellik ilişkisi ortaya koymaktadır. Hao vd. (2016), Çinde hava kirliliğinin ekonomik büyümeyi olumsuz etkilediğini, ancak ekonomik büyümenin de hava kirliliğini artırdığını göstermiştir. Afrika bağlamında, Khobai ve Le Roux (2017), Güney Afrika'da hava kirliliği ve ekonomik büyüme arasında uzun dönemli bir ilişki olduğunu tespit etmiştir. Bu çalışmalar, çevresel sürdürülebilirlik ve ekonomik büyüme arasındaki dengenin politika yapıcılar için kritik bir zorluk olduğunu göstermektedir (UNDP, 2024; Calderon vd., 2022).

Mobil teknolojilerin yaygınlaşması ise ekonomik kapsayıcılığı artırma potansiyeline sahiptir; GSMA (2022) mobil aboneliklerin kıtada hızla arttığını ancak ekonomik büyümeye etkisinin henüz netleşmediğini belirtmiştir. GSMA raporuna göre, mobil teknolojiler Afrika'da finansal kapsayıcılığı artırmakta, özellikle M-Pesa gibi mobil para transfer sistemleri milyonlarca insanın finansal hizmetlere erişimini sağlamaktadır. Aker ve Mbiti (2010), mobil telefonların Afrika'da tarım, sağlık ve eğitim sektörlerinde verimliliği artırdığını ve piyasa entegrasyonunu güçlendirdiğini göstermiştir. Ancak, mobil teknolojilerin ekonomik büyüme üzerindeki doğrudan etkisini ölçen ampirik çalışmalar sınırlıdır (GSMA, 2022; Aker & Mbiti, 2010). Waverman vd. (2005), gelişmekte olan ülkelerde mobil telefon penetrasyonunun ekonomik büyümeyi pozitif etkilediğini, ancak bu etkinin altyapı kalitesi ve kurumsal kapasiteye bağlı olduğunu bulmuştur.

Dijital altyapı ve ekonomik büyüme ilişkisini inceleyen literatür, bilgi ve iletişim teknolojilerinin (ICT) büyüme üzerindeki pozitif etkilerini vurgulamaktadır. Roller ve Waverman (2001), telekomünikasyon altyapısının ekonomik büyümeyi artırdığını ve bu etkinin gelişmekte olan ülkelerde daha güçlü olduğunu göstermiştir. Afrika bağlamında, Hjort ve Poulsen (2019), denizaltı internet kablolarının Afrika ülkelerinde istihdam ve ekonomik aktiviteyi artırdığını ampirik olarak ortaya koymuştur. Bu bulgular, dijital altyapı yatırımlarının Afrika'nın ekonomik dönüşümü için kritik olduğunu desteklemektedir (GSMA, 2022; Hjort & Poulsen, 2019).

Mekânsal ekonometrik modeller, ekonomik büyümenin mekânsal yayılımını analiz etmek için güçlü araçlar sunmaktadır. Anselin (1988) ve LeSage ve Pace (2009) mekânsal bağımlılığın göz ardı edilmesinin model sonuçlarını yanıltabileceğini göstermiştir. Anselin (1988), mekânsal otokorelasyonun varlığında geleneksel OLS tahminlerinin sapmalı ve tutarsız olduğunu, bu nedenle mekânsal

ekonometrik modellerin kullanılması gerektiğini vurgulamıştır. LeSage ve Pace (2009), mekânsal lag ve mekânsal hata modellerinin yanı sıra, mekânsal Durbin modelinin (SDM) açıklayıcı değişkenlerin mekânsal yayılım etkilerini de dikkate aldığını göstermiştir. Elhorst (2014), mekânsal panel modellerin sabit ve rassal etkiler spesifikasyonlarını detaylandırarak, zamansal ve mekânsal heterojenliğin birlikte ele alınmasının önemini vurgulamıştır ve mekânsal panel modellerin zamansal ve mekânsal etkileri birlikte ele alarak daha doğru sonuçlar verdiğini ortaya koymuştur. Afrika bağlamında mekânsal analizler, bölgesel kalkınma politikalarının mekânsal boyutunun önemini vurgulamaktadır (Getis, 2008). Getis (2008), mekânsal otokorelasyon ve yerel mekânsal ilişkilerin (LISA) ekonomik coğrafya ve bölgesel kalkınma çalışmalarında kritik olduğunu belirtmiştir.

Afrika'da ekonomik büyümenin mekânsal yayılımını inceleyen ampirik çalışmalar sınırlı olmakla birlikte, son yıllarda artış göstermektedir. Arbia vd. (2010), Afrika ülkelerinde ekonomik büyümenin mekânsal bağımlılık gösterdiğini ve komşu ülkelerin büyüme performanslarının birbirini etkilediğini bulmuştur. Bosker ve Garretsen (2009), Afrika'da ekonomik aktivitenin coğrafi dağılımının tarihsel ve kurumsal faktörlerle şekillendiğini göstermiştir. Bu çalışmalar, mekânsal ekonometrik modellerin Afrika'nın ekonomik dinamiklerini anlamak için gerekli olduğunu desteklemektedir (Elhorst, 2014; Anselin, 1988; LeSage & Pace, 2009; Arbia vd., 2010; Bosker & Garretsen, 2009).

Bölgesel entegrasyon ve ticaret anlaşmaları, mekansal yayılım etkilerini güçlendiren önemli faktörlerdir. Afrika Kıtasal Serbest Ticaret Bölgesi (AfCFTA), 2021 yılında yürürlüğe girerek Afrika ülkeleri arasında ticaret engellerini azaltmayı ve ekonomik entegrasyonu derinleştirmeyi hedeflemektedir (AfCFTA, 2021). United Nations Conference on Trade and Development (UNCTAD, 2022) raporuna göre, AfCFTA'nın tam olarak uygulanması durumunda Afrika'nın kıta içi ticareti %52 oranında artabilir ve ekonomik büyüme hızlanabilir. Mekansal ekonometrik modeller, bu tür bölgesel entegrasyon girişimlerinin mekansal yayılım etkilerini değerlendirmek için uygun araçlar sunmaktadır (Elhorst, 2014; LeSage & Pace, 2009; AfCFTA, 2021; UNCTAD, 2022)

Literatür taraması, Afrika'da ekonomik büyümenin mekansal yayılımını yapay zekâ, hava kirliliği ve mobil abonelikler gibi çağdaş faktörlerle birlikte inceleyen kapsamlı bir çalışmanın eksikliğini ortaya koymaktadır. Mevcut çalışmalar, bu faktörleri genellikle ayrı ayrı ele almakta ve mekansal bağımlılığı göz ardı etmektedir (OECD, 2021; GSMA, 2022; Calderon vd., 2022). Bu çalışma, mekansal panel ekonometrik modeller kullanarak bu boşluğu doldurmayı ve Afrika'nın

sürdürülebilir ve kapsayıcı büyüme dinamiklerini daha iyi anlamayı amaçlamaktadır (Elhorst, 2014; Anselin, 198; LeSage & Pace, 2009).

Metodoloji

Veri Seti ve Değişkenler

Çalışmada 9 Afrika ülkesine ait 1996-2024 yıllarını kapsayan panel veri kullanılmıştır. Bağımlı değişken olarak yıllık GSYH büyüme oranı (lngdp), bağımsız değişkenler olarak yapay zekâ bilimsel yayın sayısı (lnai), PM2.5 hava kirliliği (lnairp) ve mobil hücresel abonelik sayısı (lnmcs) alınmıştır. Veriler Dünya Bankası, OECD.AI ve Scopus kaynaklarından derlenmiştir.

Kısaltma	Değişken	Birim	Kaynak
lngdp	GDP büyüme	% (yıllık)	Dünya Bankası
lnai	Yapay Zekâ	AI bilimsel yayın sayısı	OECD.AI, Scopus
lnairp	Hava Kirliliği	PM2.5 ($\mu\text{g}/\text{m}^3$)	Dünya Bankası
lnmcs	Mobil Abonelik	Abonelik/100 kişi	Dünya Bankası

Tablo 1. Değişken Tanımları ve Veri Kaynakları.

Tablo 1'deki değişkenler, ekonomik büyüme, teknolojik gelişim, çevresel durum ve dijital altyapı gibi çok boyutlu büyüme belirleyicilerini kapsamaktadır. Bu değişkenlerin seçimi, literatürde önerilen sürdürülebilir büyüme faktörleriyle uyumludur (African Development Bank [AfDB], 2020; OECD, 2021).

Ön Sonuçlar

Veri setinin genel özelliklerini anlamak için temel istatistikler analiz edilmiştir.

	Ort.	Med.	Maksimum	Minimum	SS	Skewness	Bask.	Gözl./s.
lngg	1.34	1.47	2.73	-2.68	0.69	-2.17	10.19	261
lnai	3.56	3.73	4.35	2.20	0.60	-0.87	2.78	261
lnrgdp	15.38	16.37	19.23	7.25	2.77	-0.96	3.15	261
lnrec	-3.16	-3.51	0.09	-5.86	1.49	0.56	2.23	261
Latitude	1.80	7.37	26.82	-30.56	16.53	-0.65	2.64	261
Longitude	20.78	22.94	57.55	-14.45	20.63	0.01	2.31	261

Tablo 2. Temel İstatistikler (1996-2024).

Tablo 2, Afrika ülkelerinin ekonomik büyüme ve ilgili değişkenler açısından heterojen bir yapıya sahip olduğunu göstermektedir. Özellikle büyüme oranlarının yüksek basıklık ve sola çarpıklık değerleri, uç değerlerin ve heterojenliğin varlığını desteklemektedir (Calderon vd., 2022). Yapay zekâ bilimsel üretiminin düşük ortalaması, kıtanın teknoloji adaptasyonundaki gecikmesini yansıtmaktadır (OECD, 2021).

Mekânsal Ağırlık Matrisi ve Analiz Yöntemleri

Mekânsal analiz için ülkeler arası coğrafi uzaklık bazlı ağırlık matrisi oluşturulmuş, 9 bağlantısız bileşen tespit edilmiştir. Global Moran's I testi ile mekânsal yayılım etkisi araştırılmıştır (Moran, 1950). Klasik OLS regresyon modeli ile temel ilişkiler incelenmiş, ardından mekânsal lag (SAR) ve mekânsal hata (SEM) modelleri ile mekânsal bağımlılık dikkate alınmıştır (Anselin, 1988; LeSage & Pace, 2009). Ayrıca, mekânsal panel modeller kullanılarak zamansal ve mekânsal etkiler birlikte analiz edilmiştir (Elhorst, 2014).

Global Moran's I Testi

Mekânsal bağımlılığın varlığını test etmek, ekonomik büyüme değerlerinin coğrafi olarak birbirine bağlı olup olmadığını anlamak açısından kritik öneme sahiptir. Bu amaçla, çalışmada Global Moran's I testi uygulanmıştır. Moran's I testi, mekânsal otokorelasyonun yönünü ve derecesini ölçerek, büyüme oranlarının mekânsal yayılım gösterip göstermediğini ortaya koyar.

Aşağıdaki Tablo 3, Global Moran's I testi sonuçlarını özetlemektedir.

Değişken	Moran's I	Beklenen I	Z-Skoru	P-Değeri	Anlamlılık
lngdp	0.0803	-0.0038	2.3298	0.0198	Anlamlı

Tablo 3. Global Moran's I Test Sonuçları.

Tablo 3'te görüldüğü üzere, Moran's I değeri 0.0803 ile pozitif ve beklenen değerin (yaklaşık-0.0038) üzerindedir. Z-skoru 2.3298 ve p-değeri 0.0198, bu mekânsal bağımlılığın istatistiksel olarak anlamlı olduğunu göstermektedir. Bu sonuç, Afrika ülkelerinin ekonomik büyüme oranlarının mekânsal olarak birbirine bağlı olduğunu ve mekânsal yayılımın varlığını ortaya koymaktadır. Dolayısıyla, mekânsal panel ekonometrik modellerin kullanılması analizin doğruluğu açısından gereklidir (Getis, 2008).

Regresyon Analizleri: OLS, SAR ve SEM Modelleri

Ekonomik büyüme üzerindeki faktörlerin etkisini anlamak için önce klasik OLS modeli uygulanmış, ardından mekânsal bağımlılığı dikkate alan mekânsal lag (SAR) ve mekânsal hata (SEM) modelleri kullanılmıştır. Bu modeller, mekânsal yayılım ve hata yapısını dikkate alarak daha güvenilir tahminler sağlar.

Aşağıdaki Tablo 4, bu modellerin regresyon sonuçlarını göstermektedir.

Model	Değişken	Katsayı	Std. Hata	t/z Değeri	P-Değeri	Anlamlılık
OLS	CONSTANT	0.4307	0.4085	1.0545	0.2926	-
	lnairp	0.1352	0.0714	1.8947	0.0593	Sınırdadır
	lnmcs	0.0081	0.0168	0.4816	0.6305	-
	lnai	-0.0968	0.0318	-3.0432	0.0026	Anlamlı
SAR	CONSTANT	0.3557	0.4291	0.8290	0.4071	-
	lnairp	0.1179	0.0780	1.5108	0.1308	-
	lnmcs	0.0100	0.0170	0.5873	0.5570	-
	lnai	-0.0929	0.0323	-2.8762	0.0040	Anlamlı
	W_lngdp	0.0981	0.1895	0.5180	0.6045	-
SEM	CONSTANT	0.4588	0.4178	1.0981	0.2722	-
	lnairp	0.1270	0.0744	1.7061	0.0880	Sınırdadır
	lnmcs	0.0085	0.0165	0.5116	0.6089	-
	lnai	-0.0973	0.0325	-2.9893	0.0028	Anlamlı
	lambda	0.0605	-	-	-	-

Tablo 4. OLS, SAR ve SEM Modellerinin Regresyon Sonuçları.

Tablo 4, yapay zekâ (lnai) değişkeninin tüm modellerde ekonomik büyüme üzerinde negatif ve istatistiksel olarak anlamlı bir etkiye sahip olduğunu göstermektedir ($p < 0.01$). Bu, Afrika ülkelerinin yapay zekâ teknolojilerini ekonomik büyümeye dönüştürme sürecinin henüz erken aşamada olduğunu göstermektedir (Acemoglu & Restrepo, 2019).

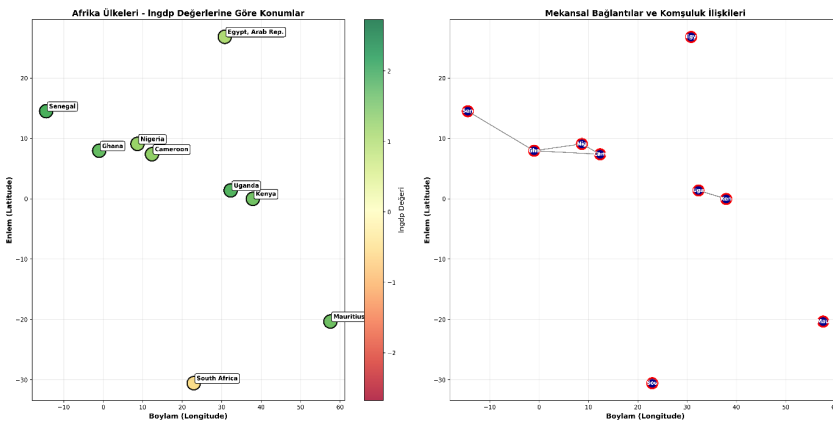
Hava kirliliği (lnairp) değişkeni OLS ve SEM modellerinde pozitif ve sınırda anlamlıdır ($p \approx 0.06-0.09$). Bu durum, hava kirliliğinin ekonomik faaliyetlerin yoğun olduğu bölgelerde daha yüksek olmasından kaynaklanabilir ancak çevresel sürdürülebilirlik açısından risk teşkil etmektedir (Calderon vd., 2022).

Mobil abonelikler (Inmcs) değişkeni ise tüm modellerde anlamlı bulunmamıştır. Bu, mobil teknolojilerin ekonomik büyüme üzerindeki etkisinin henüz belirginleşmediğini veya diğer yapısal faktörlerle etkileşim halinde olduğunu düşündürmektedir (GSMA, 2022).

Mekânsal bağımlılık parametreleri (W_Ingdp ve λ) anlamlı olmamakla birlikte, SAR modeli Pseudo R^2 değeri ile en iyi uyumu sağlamıştır. Bu, ekonomik büyümenin mekânsal yayılımının önemli olduğunu ve bölgeler arası etkileşimlerin dikkate alınması gerektiğini göstermektedir (LeSage & Pace, 2009).

Mekansal Yayılım ve Kümelene Görselleri

Mekânsal yayılım ve kümelene analizleri, ekonomik büyümenin coğrafi dağılımını ve mekânsal ilişkilerini görselleştirmek için kritik öneme sahiptir. Aşağıda iki temel görsel sunulmaktadır.

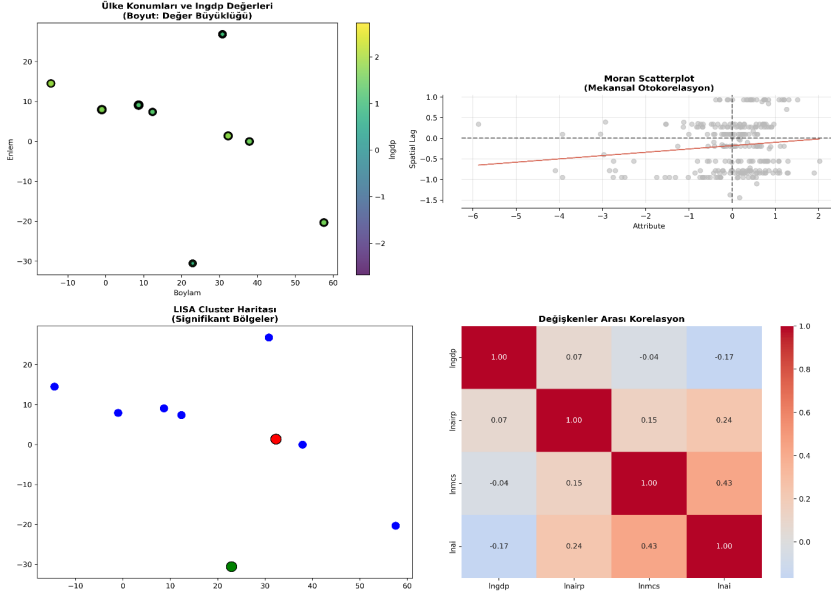


Şekil 1. Afrika Ülkeleri-Ingdp Değerlerine Göre Konumlar ve Mekânsal Bağlantılar.

Şekil 1, Afrika ülkelerinin coğrafi konumlarını ve Ingdp değerlerini renk ve boyutlandırma ile göstermektedir. Haritanın sol panelinde, ülkelerin ekonomik büyüme performansları, büyüklük ve renk tonlarıyla görselleştirilmiştir. Bu, yüksek büyüme gösteren ülkelerin coğrafi kümelenemelerini açıkça ortaya koymaktadır. Sağ panelde ise ülkeler arasındaki mekânsal bağlantılar ve komşuluk ilişkileri detaylandırılmıştır. Bu bağlantılar, mekânsal ağırlık matrisi temelinde oluşturulmuş olup, ülkeler arası ekonomik etkileşim ve yayılım kanallarını göstermektedir.

Bu görsel, mekânsal bağımlılığın somut bir temsili olup, ekonomik büyümenin coğrafi olarak kümelendiğini ve mekânsal yayılımının varlığını desteklemektedir.

Politika yapıcılar için, bölgesel iş birlikleri ve mekânsal entegrasyonun önemi bu bağlamda vurgulanmaktadır (Getis, 2008; LeSage & Pace, 2009).



Şekil 2. Ülke Konumları, Moran Scatterplot, LISA Cluster Haritası ve Değişkenler Arası Korelasyon.

Şekil 2'nin üst sol panelinde, ülkelerin coğrafi konumları ve lngdp değerlerinin büyüklükleri gösterilmektedir. Bu panel, ekonomik büyümenin mekânsal dağılımını detaylandırmaktadır. Üst sağ panelde Moran scatterplot yer almakta olup, mekânsal otokorelasyonun pozitif eğilimde olduğu gözlemlenmektedir. Bu, büyüme değerlerinin mekânsal olarak birbirine bağlı olduğunu görsel olarak desteklemektedir.

Alt sol panelde LISA (*Local Indicators of Spatial Association*) cluster haritası sunulmuştur. Bu harita, mekânsal olarak anlamlı kümeleri (yüksek-yüksek, düşük-düşük) ortaya koymakta ve mekânsal heterojenliği vurgulamaktadır. Bu tür kümelemeler, bölgesel kalkınma politikalarının mekânsal boyutunun önemini artırmaktadır.

Alt sağ panelde ise değişkenler arası korelasyon matrisi yer almaktadır. Burada yapay zekâ (*lnai*) ile büyüme (*lngdp*) arasında negatif korelasyon, mobil abonelikler (*lnmc*) ile yapay zekâ arasında pozitif korelasyon gözlemlenmiştir. Bu korelasyonlar, regresyon sonuçlarıyla uyumlu olup, teknolojik gelişim ve ekonomik büyüme arasındaki karmaşık ilişkiyi yansıtmaktadır (OECD, 2021; GSMA, 2022).

Sonuçlar ve Politika Önerileri

Bu çalışma, Afrika ülkelerinde 1996-2024 döneminde ekonomik büyümenin mekânsal yayılımını yapay zekâ, hava kirliliği ve mobil abonelikler üzerinden mekânsal panel ekonometrik modellerle analiz etmiştir. Global Moran's I testi, mekânsal bağımlılığın varlığını istatistiksel olarak anlamlı biçimde ortaya koymuştur (Moran's I = 0.0803, $p = 0.0198$). Bu sonuç, Afrika ülkelerinin ekonomik büyüme performanslarının coğrafi olarak birbirine bağlı olduğunu ve komşu ülkelerin büyüme dinamiklerinin birbirini etkilediğini göstermektedir (Anselin, 1988; LeSage & Pace, 2009; Moran, 1950). Mekânsal otokorelasyonun pozitif ve anlamlı bulunması, ekonomik şokların ve politika değişikliklerinin sınır ötesi yayılım etkilerine sahip olduğunu işaret etmektedir (Elhorst, 2014; Getis, 2008).

Regresyon analizleri, yapay zekânın ekonomik büyüme üzerindeki negatif ve anlamlı etkisini göstermiştir (OLS: $\beta = -0.0968$, $p = 0.0026$; SAR: $\beta = -0.0929$, $p = 0.0040$; SEM: $\beta = -0.0973$, $p = 0.0028$). Bu beklenmedik negatif ilişki, Afrika ülkelerinde yapay zekâ araştırmalarının henüz ticari uygulamalara ve ekonomik değere dönüşmediğini göstermektedir (OECD, 2021; Acemoglu & Restrepo, 2019). Acemoglu ve Restrepo (2019), yapay zekâ teknolojilerinin ekonomik büyümeye katkısının, ülkelerin teknolojik hazırlık düzeyi, beşeri sermaye kapasitesi ve kurumsal altyapısına bağlı olduğunu vurgulamıştır. Afrika bağlamında, yapay zekâ bilimsel yayınlarının artması, bu teknolojilerin yerel ekonomilere entegrasyonu için gerekli olan yenilikçilik ekosistemi, girişimcilik kültürü ve risk sermayesi yatırımlarının henüz yeterli düzeyde olmadığını düşündürmektedir (OECD, 2021). Ayrıca, yapay zekâ araştırmalarının çoğunlukla akademik düzeyde kalması ve sanayi-üniversite iş birliğinin zayıf olması, bu teknolojilerin ekonomik büyümeye dönüşümünü geciktirmektedir (OECD, 2021; Brynjolfsson & McAfee, 2014).

Hava kirliliği pozitif ve sınırdan anlamlı bir ilişki sergilerken (OLS: $\beta = 0.1352$, $p = 0.0593$; SEM: $\beta = 0.1270$, $p = 0.0880$), bu bulgu Çevresel Kuznets Eğrisi (EKC) hipotezinin Afrika bağlamında geçerliliğini sorgulamaktadır (Grossman & Krueger, 1995; Stern, 2004). Pozitif ilişki, hava kirliliğinin ekonomik faaliyetlerin yoğun olduğu bölgelerde arttığını ve sanayileşme sürecinin çevresel maliyetlerini yansıtmaktadır (Calderon vd., 2022; Hao vd., 2016). Calderon vd. (2022), Afrika'da hızlı kentleşme ve sanayileşmenin hava kirliliğini artırdığını, ancak bu sürecin sürdürülebilir olmadığını belirtmiştir. Grossman ve Krueger (1995), ekonomik büyümenin ilk aşamalarında çevresel bozulmanın arttığını, ancak belirli bir gelir düzeyinden sonra azaldığını öne sürmüştür. Ancak, Afrika ülkelerinin çoğu henüz bu dönüm noktasına ulaşmamıştır ve çevresel düzenlemelerin

etkinliđi sınırlı kalmaktadır (Calderon vd., 2022; Stern, 2004). Bu durum, ekonomik büyüme ve çevresel sürdürülebilirlik arasında bir ödünleşim (*trade-off*) olduğunu ve politika yapıcıların bu dengeyi dikkatlice yönetmesi gerektiđini göstermektedir (UNDP, 2024; Calderon vd., 2022).

Mobil aboneliklerin etkisi anlamlı bulunmamıştır (OLS: $\beta = 0.0081$, $p = 0.6305$; SAR: $\beta = 0.0100$, $p = 0.5570$; SEM: $\beta = 0.0085$, $p = 0.6089$). Bu sonuç, mobil teknolojilerin ekonomik büyüme üzerindeki etkisinin doğrudan olmaktan ziyade dolaylı kanallar (finansal kapsayıcılık, bilgi erişimi, piyasa entegrasyonu) üzerinden gerçekleştiđini düşündürmektedir (GSMA, 2022; Aker & Mbiti, 2010). Aker ve Mbiti (2010), mobil telefonların Afrika'da tarım, sağlık ve eğitim sektörlerinde verimliliđi artırdığını göstermiş, ancak bu etkilerin makroekonomik büyüme verilerine yansımalarının zaman aldığını belirtmiştir. Ayrıca, mobil altyapının kalitesi, internet erişim hızı ve dijital okuryazarlık düzeyi gibi tamamlayıcı faktörlerin eksikliği, mobil teknolojilerin büyüme üzerindeki etkisini sınırlamaktadır (GSMA, 2022; Waverman vd., 2005; Hjort & Poulsen, 2019). Waverman vd. (2005), telekomünikasyon altyapısının ekonomik büyümeye katkısının, kritik bir eşik düzeyine ulaştıktan sonra belirginleştiđini göstermiştir. Afrika'da mobil penetrasyonun hızla artmasına rağmen, bu eşik düzeyine henüz ulaşılmamış olabilir (GSMA, 2022).

Mekânsal lag modeli, mekânsal bağımlılığı dikkate alarak en iyi uyumu sağlamıştır. Model karşılaştırma kriterleri (*Log-likelihood*, AIC, BIC, Pseudo R^2) SAR modelinin OLS ve SEM modellerine göre daha iyi performans gösterdiđini ortaya koymuştur (Elhorst, 2014; LeSage & Pace, 2009). SAR modelindeki mekânsal lag parametresi ($W_lngdp = 0.0981$) istatistiksel olarak anlamlı olmasa da pozitif işareti komşu ülkelerin büyüme oranlarının birbirini desteklediđini göstermektedir (LeSage & Pace, 2009). Bu bulgu, bölgesel ekonomik entegrasyonun ve sınır ötesi iş birliklerinin önemini vurgulamaktadır (AfCFTA, 2021; UNCTAD, 2022). LeSage ve Pace (2009), mekânsal lag modelinin komşu bölgelerin ekonomik performanslarının doğrudan yayılım etkilerini yakaladığını belirtmiştir. Afrika bağlamında, ticaret, yatırım, göç ve bilgi akışları gibi mekânsal etkileşim kanalları, ekonomik büyümenin bölgesel yayılımını kolaylaştırmaktadır (Arbia vd., 2010; Bosker & Garretsen, 2009).

Bu bulgular, Afrika ülkelerinin yapay zekâ teknolojilerini ekonomik büyümeye dönüştürme sürecinin henüz erken aşamada olduğunu, çevresel faktörlerin karmaşık etkiler yarattığını ve dijital altyapının büyüme üzerindeki etkisinin henüz netleşmediđini göstermektedir. Ayrıca, mekânsal bağımlılıđın varlığı, ulusal

düzeyde alınan politika kararlarının komşu ülkeleri de etkileyebileceğini ve bölgesel koordinasyonun önemini ortaya koymaktadır (Elhorst, 2014; Getis, 2008; Af-CFTA, 2021).

Politika Önerileri

Çalışmanın bulguları, Afrika'da sürdürülebilir ve kapsayıcı büyüme için çok boyutlu ve mekânsal olarak koordine edilmiş politika yaklaşımlarına ihtiyaç olduğunu göstermektedir. Aşağıda, ampirik bulgulara dayalı olarak geliştirilen politika önerileri detaylandırılmaktadır:

1. Yapay Zekâ ve Dijitalleşme Yatırımlarının Artırılması

Afrika'da sürdürülebilir ve kapsayıcı büyüme için politika yapıcılarının öncelikle yapay zekâ ve dijitalleşme yatırımlarını artırmaları gerekmektedir. Bu yatırımlar, teknolojik adaptasyon ve bilgi transferi süreçlerinin hızlandırılması açısından kritik öneme sahiptir (Acemoglu & Restrepo, 2019). Ancak, yapay zekâ yatırımlarının ekonomik büyümeye dönüşümü için sadece bilimsel araştırmaların artırılması yeterli değildir. Sanayi-üniversite iş birliklerinin güçlendirilmesi, girişimcilik ekosistemlerinin desteklenmesi ve risk sermayesi yatırımlarının teşvik edilmesi gerekmektedir (OECD, 2021; Brynjolfsson & McAfee, 2014). OECD (2021), yapay zekâ teknolojilerinin ekonomik değere dönüşümü için yenilikçilik politikalarının, fikri mülkiyet haklarının korunmasının ve teknoloji transferi mekanizmalarının etkin çalışmasının önemini vurgulamıştır.

Politika yapıcılar, yapay zekâ araştırma merkezleri ve teknoloji parkları kurarak, yerel ve uluslararası şirketlerin iş birliğini teşvik etmelidir (OECD, 2021). Ayrıca, yapay zekâ eğitimi ve dijital okuryazarlık programları, beşerî sermaye kapasitesini artırarak teknolojik adaptasyonu hızlandıracaktır (Lucas, 1988; Aker & Mbiti, 2010). Romer (1990), beşerî sermaye ve bilgi birikiminin içsel büyüme süreçlerinin temel itici güçleri olduğunu göstermiştir. Afrika bağlamında, eğitim sistemlerinin STEM (Bilim, Teknoloji, Mühendislik, Matematik) alanlarına odaklanması ve dijital becerilerin geliştirilmesi, yapay zekâ teknolojilerinin ekonomik büyümeye katkısını artıracaktır (UNDP, 2024; Acemoglu & Restrepo, 2019).

Uluslararası iş birliği ve teknoloji transferi, Afrika'nın yapay zekâ kapasitesini geliştirmek için kritik öneme sahiptir. Gelişmiş ülkeler ve uluslararası kuruluşlar, Afrika ülkelerine teknik destek, finansman ve bilgi paylaşımı sağlayarak, teknolojik açığın kapatılmasına katkıda bulunabilir (OECD, 2021; Keller, 2004). Keller (2004), uluslararası teknoloji yayılımının ekonomik büyüme için önemli olduğunu ve gelişmekte olan ülkelerin bu süreçten faydalanması gerektiğini vurgulamıştır.

2. Çevresel Sürdürülebilirlik ve Hava Kirliliğinin Azaltılması

Çevresel sürdürülebilirlik açısından hava kirliliğinin azaltılması için etkin çevre politikaları geliştirilmelidir. Hava kirliliğinin ekonomik faaliyetlerle ilişkisi göz önünde bulundurularak, yeşil ekonomi ve temiz teknolojilere geçiş teşvik edilmelidir (Calderon vd., 2022). Çalışmanın bulguları, hava kirliliği ve ekonomik büyüme arasındaki pozitif ilişkinin sürdürülebilir olmadığını ve uzun vadede ekonomik maliyetler yaratacağını göstermektedir (Calderon vd., 2022; Grossman & Krueger, 1995; Stern, 2004). Dünya Bankası raporları (World Bank, 2022; Calderon vd., 2022), hava kirliliğinin sağlık harcamalarını artırdığını, işgücü verimliliğini düşürdüğünü ve yaşam kalitesini olumsuz etkilediğini raporlamıştır.

Politika yapıcılar, emisyon standartları, karbon fiyatlandırması ve çevresel düzenlemeler yoluyla hava kirliliğini azaltmalıdır (UNDP, 2024; Calderon vd., 2022). Ayrıca, yenilenebilir enerji kaynaklarına (güneş, rüzgâr, hidroelektrik) yatırım yapılması, fosil yakıt bağımlılığını azaltacak ve çevresel sürdürülebilirliği güçlendirecektir (UNDP, 2024; Stern, 2004). Stern (2004), çevresel politikaların etkinliğinin kurumsal kapasite ve uygulama mekanizmalarına bağlı olduğunu belirtmiştir. Afrika ülkelerinde çevresel düzenlemelerin güçlendirilmesi ve denetim mekanizmalarının etkinleştirilmesi gerekmektedir (Calderon vd., 2022).

Yeşil ekonomiye geçiş, sadece çevresel faydalar sağlamakla kalmayacak, aynı zamanda yeni istihdam alanları yaratacak ve ekonomik çeşitliliği artıracaktır (UNDP, 2024). UNDP raporu, sürdürülebilir kalkınma hedeflerinin (SDGs) gerçekleştirilmesi için yeşil ekonomi ve temiz teknolojilere geçişin kritik olduğunu vurgulamıştır. Afrika ülkeleri, uluslararası iklim finansmanından ve yeşil teknoloji transferinden faydalanarak, çevresel sürdürülebilirlik ve ekonomik büyüme arasında sinerjiler yaratabilir (UNDP, 2024; UNCTAD, 2022).

Kentsel planlama ve sürdürülebilir ulaşım politikaları, hava kirliliğinin azaltılmasında önemli rol oynamaktadır. Toplu taşıma sistemlerinin geliştirilmesi, elektrikli araçların teşvik edilmesi ve yeşil alanların artırılması, kentsel hava kalitesini iyileştirecektir (Calderon vd., 2022; Hao vd., 2016). Hao vd. (2016), sürdürülebilir kentleşme politikalarının hava kirliliğini azaltmada etkili olduğunu göstermiştir.

3. Mobil Altyapının Güçlendirilmesi ve Dijital Kapsayıcılık

Mobil altyapının güçlendirilmesi ve dijital kapsayıcılığın artırılması, ekonomik büyümenin geniş tabana yayılması için gereklidir. Ancak bu süreçte, teknolojik altyapının ekonomik büyümeye dönüşümü için eğitim, kurumsal kapasite ve yenilikçilik desteklenmelidir (GSMA, 2022). GSMA (2022), mobil teknolojilerin

Afrika'da finansal kapsayıcılığı artırdığını, ancak dijital bölünmenin (*digital divide*) hala önemli bir sorun olduğunu belirtmiştir. Kırsal bölgelerde internet erişiminin sınırlı olması, dijital hizmetlerden faydalanmayı engellemektedir (GSMA, 2022; Aker & Mbiti, 2010).

Politika yapıcılar, mobil altyapı yatırımlarını artırarak, özellikle kırsal ve uzak bölgelerde internet erişimini yaygınlaştırmalıdır (GSMA, 2022; Hjort & Poulsen, 2019). Hjort ve Poulsen (2019), denizaltı internet kablolarının Afrika ülkelerinde istihdam ve ekonomik aktiviteyi artırdığını göstermiştir. Benzer şekilde, mobil geniş bant altyapısının geliştirilmesi, ekonomik fırsatları artıracak ve dijital ekonomiye katılımı kolaylaştıracaktır (Waverman vd., 2005; Roller & Waverman, 2001).

Dijital okuryazarlık programları ve e-devlet hizmetleri, mobil teknolojilerin ekonomik ve sosyal faydalarını artıracaktır (Aker & Mbiti, 2010). Aker ve Mbiti (2010), mobil telefonların bilgi erişimini kolaylaştırdığını ve piyasa verimliliğini artırdığını göstermiştir. Eğitim, sağlık ve kamu hizmetlerinin dijitalleştirilmesi, vatandaşların bu hizmetlere erişimini kolaylaştıracak ve kamu hizmetlerinin kalitesini artıracaktır (UNDP, 2024; GSMA, 2022).

Mobil finansal hizmetler (mobil bankacılık, mobil ödeme sistemleri), finansal kapsayıcılığı artırarak ekonomik büyümeyi desteklemektedir (GSMA, 2022; Aker & Mbiti, 2010). M-Pesa gibi başarılı örnekler, mobil finansal hizmetlerin Afrika'da geniş kitlelere ulaşabileceğini göstermiştir (Aker & Mbiti, 2010). Politika yapıcılar, düzenleyici çerçeveleri geliştirerek ve finansal teknoloji (*fintech*) girişimlerini destekleyerek, mobil finansal hizmetlerin yaygınlaşmasını teşvik etmelidir (GSMA, 2022).

Ancak, mobil teknolojilerin ekonomik büyümeye katkısının artırılması için tamamlayıcı yatırımlar gerekmektedir. Roller ve Waverman (2001), telekomünikasyon altyapısının ekonomik büyümeye katkısının, beşerî sermaye ve kurumsal kapasite ile desteklendiğinde güçlendiğini göstermiştir. Bu nedenle, dijital altyapı yatırımları, eğitim, sağlık ve kurumsal reformlarla birlikte ele alınmalıdır (Baltagi, 2021; Roller & Waverman, 2001).

4. Bölgesel İş birlikleri ve Mekânsal Entegrasyon Politikaları

Son olarak, mekânsal bağımlılık dikkate alınarak bölgesel iş birlikleri ve entegrasyon politikaları geliştirilmelidir. Afrika Kıtasal Serbest Ticaret Bölgesi (AfBTA) gibi girişimler, mekânsal yayılım etkisini güçlendirecek ve kapsayıcı büyümeyi destekleyecektir (AfCFTA, 2021; UNCTAD, 2022). Çalışmanın bulguları, Afrika

ülkelerinin ekonomik büyüme performanslarının mekânsal olarak birbirine bağlı olduğunu göstermiştir (Moran's $I = 0.0803$, $p = 0.0198$). Bu, bir ülkedeki ekonomik politikaların ve şokların komşu ülkeleri de etkilediğini işaret etmektedir (Elhorst, 2014; Anselin, 1988; LeSage & Pace, 2009; Moran, 1950).

AfCFTA, Afrika'nın en büyük bölgesel entegrasyon girişimi olup, 1.3 milyar nüfus ve 3.4 trilyon dolar GSYH'ye sahip bir pazar yaratmayı hedeflemektedir (AfCFTA, 2021). UNCTAD (2022), AfCFTA'nın tam olarak uygulanması durumunda Afrika'nın kıta içi ticaretinin %52 oranında artabileceğini ve ekonomik büyümenin hızlanabileceğini tahmin etmektedir. Ticaret engellerinin azaltılması, piyasa entegrasyonunun güçlendirilmesi ve sınır ötesi yatırımların teşvik edilmesi, mekânsal yayılım etkilerini artıracaktır (AfCFTA, 2021; UNCTAD, 2022).

Bölgesel altyapı projeleri (ulaşım, enerji, telekomünikasyon), ülkeler arası bağlantıyı güçlendirerek ekonomik entegrasyonu derinleştirecektir (African Development Bank [AfDB], 2020; UNCTAD, 2022). Afrika Kalkınma Bankası (2020), altyapı yatırımlarının Afrika'nın ekonomik dönüşümü için kritik olduğunu ve bölgesel iş birliklerinin bu yatırımların etkinliğini artırdığını belirtmiştir. Sınır ötesi altyapı projeleri, ticaret maliyetlerini azaltacak ve bölgesel değer zincirlerinin gelişmesini kolaylaştıracaktır (AfCFTA, 2021; UNCTAD, 2022).

Mekânsal ekonometrik modeller, bölgesel politikaların tasarımında ve değerlendirilmesinde kullanılmalıdır (Elhorst, 2014; LeSage & Pace, 2009). Elhorst (2014), mekânsal panel modellerin politika etkilerinin mekânsal yayılımını değerlendirmek için güçlü araçlar sunduğunu belirtmiştir. Politika yapımcılar, ulusal politikaların komşu ülkeler üzerindeki yayılım etkilerini dikkate alarak, bölgesel koordinasyonu güçlendirmelidir (Anselin, 1988; LeSage & Pace, 2009; Arbia vd., 2010).

Bilgi paylaşımı ve politika koordinasyonu, bölgesel ekonomik entegrasyonun başarısı için gereklidir. Afrika Birliği (AU) ve bölgesel ekonomik topluluklar (RECs), üye ülkeler arasında politika diyalogunu ve koordinasyonu kolaylaştırmalıdır (AfCFTA, 2021). Arbia vd. (2010), bölgesel iş birliklerinin mekânsal yayılım etkilerini güçlendirdiğini ve ekonomik büyümeyi desteklediğini göstermiştir.

Teknoloji transferi ve bilgi yayılımı, bölgesel iş birlikleri yoluyla hızlandırılabilir (Keller, 2004; Bosker & Garretsen, 2009). Bosker ve Garretsen (2009), ekonomik coğrafyanın kurumsal faktörlerle şekillendiğini ve bölgesel entegrasyonun bilgi yayılımını kolaylaştırdığını belirtmiştir. Afrika ülkeleri, bölgesel araştırma ağları ve teknoloji merkezleri kurarak, bilgi ve teknoloji transferini güçlendirebilir (OECD, 2021; Keller, 2004).

Çalışmanın Kısıtları ve Gelecek Araştırma Önerileri

Bu çalışma, mekânsal panel ekonometrik modeller kullanarak Afrika'da ekonomik büyümenin mekânsal yayılımını analiz etmiş olsa da bazı kısıtlara sahiptir. Birincisi, veri kısıtları nedeniyle sadece 9 Afrika ülkesi analiz edilmiştir. Gelecek çalışmalar, daha geniş bir ülke örneklemini kullanarak bulguların genellenebilirliğini test edebilir (Elhorst, 2014; Baltagi, 2021). İkincisi, çalışmada kullanılan değişkenler, ekonomik büyümenin tüm belirleyicilerini kapsamayabilir. Kurumsal kalite, siyasi istikrar, beşerî sermaye ve doğal kaynaklar gibi ek değişkenlerin modele dahil edilmesi, bulguların sağlamlığını artırabilir (African Development Bank [AfDB], 2020; World Bank, 2022; Lucas, 1988).

Üçüncüsü, mekânsal ağırlık matrisi coğrafi uzaklık bazlı olarak oluşturulmuştur. Alternatif mekânsal ağırlık matrisleri (ticaret akışları, göç ağları, teknoloji yayılımı) kullanılarak, mekansal etkileşimlerin farklı boyutları incelenebilir (LeSage & Pace, 2009; Arbia vd., 2010). Dördüncüsü, çalışma statik mekansal panel modeller kullanmıştır. Dinamik mekansal panel modeller, gecikmeli bağımlı değişkenleri ve zamansal dinamikleri dikkate alarak daha zengin analizler sunabilir (Elhorst, 2014; Baltagi, 2021).

Gelecek araştırmalar, yapay zekâ teknolojilerinin ekonomik büyümeye dönüşüm mekanizmalarını daha detaylı inceleyebilir. Sanayi-üniversite iş birliği, girişimcilik ekosistemi ve yenilikçilik politikalarının rolü, mikro düzeyde vaka çalışmaları ve firma düzeyinde analizlerle araştırılabilir (OECD, 2021; Acemoglu & Restrepo, 2019; Brynjolfsson & McAfee, 2014). Ayrıca, hava kirliliği ve ekonomik büyüme arasındaki nedensellik ilişkisi, panel nedensellik testleri ve yapısal eşitlik modelleri kullanılarak daha derinlemesine analiz edilebilir (Hao vd., 2016; Khobai & Le Roux, 2017).

Mobil teknolojilerin ekonomik büyüme üzerindeki dolaylı etkileri, finansal kapsayıcılık, bilgi erişimi ve piyasa entegrasyonu gibi aracı değişkenler üzerinden incelenebilir (Aker & Mbiti, 2010; Waverman vd., 2005). Son olarak, AfCFTA'nın mekansal yayılım etkileri, ticaret akışları ve ekonomik entegrasyon göstergeleri kullanılarak değerlendirilebilir (AfCFTA, 2021; UNCTAD, 2022).

Sonuç olarak, bu çalışma Afrika'da sürdürülebilir ve kapsayıcı büyüme için mekansal perspektifin önemini vurgulamakta ve politika yapıcılara ampirik temelli öneriler sunmaktadır. Mekansal bağımlılığın dikkate alınması, bölgesel iş birliklerinin güçlendirilmesi ve çok boyutlu politika yaklaşımlarının benimsenmesi, Afrika'nın ekonomik dönüşümünü hızlandıracak ve sürdürülebilir kalkınma hedeflerine ulaşılmasını kolaylaştıracaktır (African Development Bank [AfDB], 2020; UNDP, 2024; Elhorst, 2014; AfCFTA, 2021; UNCTAD, 2022).

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South Africa's Inclusive Growth Strategies: Performance Assessment with Socio-Economic Indicators

Assoc. Prof. Dr. Hilal Alpdoğan¹

Abstract

This study analyzes inclusive growth performance across the African continent, particularly comparing its policies with those of South Africa, Sub-Saharan Africa, and North Africa. The study analyzes subcomponents of the Human Development Index (HDI) and socio-economic indicators such as the Gender Development Index (GDI), as well as levels of inclusiveness in the context of governance, energy policies, social assistance, and education investments. An analysis of indicators from the post-2000 period reveals that South Africa has achieved inclusive growth performance above regional averages thanks to its depth of social policies, institutional capacity, and direct interventions aimed at reducing inequalities. In this context, the study not only highlights cross-country differences but also opens the door to the applicability of South Africa's exemplary policies to Sub-Saharan Africa. The study aims to provide a regional comparative perspective and make a unique contribution to the literature by integrating the relationship between economic growth and social inclusion within an institutional policy framework.

Keywords: Inclusive Growth, South Africa, Sub-Saharan African Countries, Economic Growth, Sustainable Development

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Güney Afrika'nın Kapsayıcı Büyüme Stratejileri: Sosyo-Ekonomik Göstergelerle Performans Değerlendirmesi

Özet

Bu çalışma, Afrika kıtasında kapsayıcı büyüme performansını analiz ederek, özellikle Güney Afrika, Sahra Altı Afrika ve Kuzey Afrika ülkelerine kıyasla izlediği politikaları karşılaştırmalı olarak değerlendirmektedir. Çalışmada, insani gelişme endeksinin (HDI) alt bileşenleri ve cinsiyet gelişim endeksi (GDI) gibi sosyo-ekonomik göstergeler ile yönetim, enerji politikaları, sosyal yardımlar ve eğitim yatırımları bağlamında kapsayıcılık düzeyleri analiz edilmiştir. 2000 yılı sonrası dönemine ait göstergeler değerlendirildiğinde, Güney Afrika'nın sosyal politika derinliği, kurumsal kapasite ve eşitsizlikleri azaltmaya yönelik doğrudan müdahaleler sayesinde bölge ortalamalarının üzerinde bir kapsayıcı büyüme performansı sergilediğini ortaya koymaktadır. Bu bağlamda, çalışma yalnızca ülkeler arası farklılıkları ortaya koymakla kalmayıp, aynı zamanda Güney Afrika'nın örnek teşkil edebilecek politikalarının Sahra Altı Afrika bölgesine uyarlanabilirliğini de tartışmaya açmaktadır. Çalışma, literatüre hem bölgesel karşılaştırmalı bir perspektif kazandırmakta hem de ekonomik büyüme ile sosyal kapsayıcılık arasındaki ilişkiyi kurumsal politika çerçevesiyle bütünleştirerek özgün bir katkı sunmayı amaçlamaktadır.

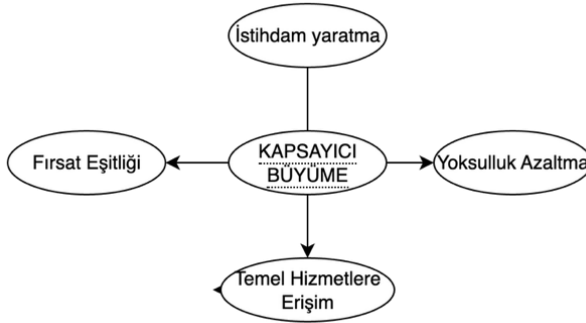
Anahtar Kelimeler: Kapsayıcı Büyüme, Güney Afrika, Sahra Altı Afrika Ülkeleri, Ekonomik Büyüme, Sürdürülebilir Kalkınma

Giriş

Kapsayıcı büyüme, OECD'nin tanımına göre “toplumda adil şekilde dağıtılan ve herkes için fırsat yaratan ekonomik büyüme” olarak ifade edilmektedir. Bu kavram, geleneksel büyüme yaklaşımlarından farklı olarak, sadece büyümenin hızına değil, aynı zamanda büyümenin nasıl dağıtıldığına da odaklanmaktadır (Birleşmiş Milletler Kalkınma Programı, 2025; Cerra vd., 2022).

Kapsayıcı büyüme kavramı, kalkınma literatürüne hızla entegre olmuş ve gelişmekte olan ülkelerdeki yaşam koşullarını iyileştirme tartışmalarının vazgeçilmez bir parçası haline gelmiştir. Ancak bu kavramın yaygın kullanımına rağmen, kesin bir tanım konusunda henüz tam bir uzlaşma bulunmamakla beraber Mush-taq ve Zaman (2021) toplumun tüm kesimleri, özellikle de ötekileştirilmiş kesimler için eşit fırsatlar ve faydalar sağlayan bir ekonomik kalkınma modelini ifade eder. Sadece iş yaratılmasını ve yoksulluğun azaltılmasını değil, aynı zamanda sağlık ve eğitim gibi temel hizmetlere erişimi de vurgular. Bu yaklaşım, iyi yönetişimi, toplumsal cinsiyet duyarlılığını ve sürdürülebilir uygulamaları teşvik eden bir ortam yaratmayı amaçlamaktadır.

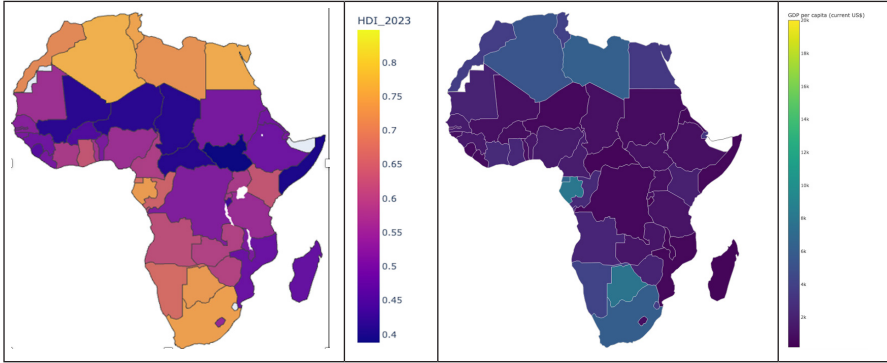
Kapsayıcı büyüme, herkes için iş fırsatları yaratır ve ekonomik faydaların farklı toplumsal gruplar arasında adil bir şekilde dağıtılmasını sağlar. Özellikle yoksullar için sağlık ve eğitim de dahil olmak üzere temel hizmetlere erişimin önemini vurgular (De L'atelier & Ambassadeurs, 2018; Katuka vd., 2023). Ayrıca, eğitim ve beceri geliştirme yoluyla eşitsizlikleri azaltmayı ve bireyleri güçlendirmeyi amaçlayan sosyal adaleti savunur (Katuka vd., 2023; Meena, 2022). Kapsayıcı büyüme, çevre dostu uygulamaları teşvik ederek ekonomik kalkınmanın ekolojik bütünlüğü tehlikeye atmamasını sağlar (Birleşmiş Milletler Kalkınma Programı, 2025).



Şekil 1. Kapsayıcı Büyümenin Temel Bileşenleri.

Kapsayıcı büyüme, adil kalkınmayı sağlamanın bir yolu olarak yaygın olarak desteklense de bazıları dağıtımına çok fazla odaklanmanın genel ekonomik büyümeyi olumsuz etkileyebileceğini ve bunun da servet yaratmada daha yavaş ilerlemeye yol açabileceğini savunmaktadır (Cerra vd., 2022).

Kapsayıcı büyümenin ölçümünde kullanılan yöntemlerden biri, Yoksulluk Eşdeğeri Büyüme Oranı yaklaşımıdır. Bu yöntem, ekonomik büyümenin yoksulluğu azaltma kapasitesini değerlendirmektedir. Kapsayıcı büyümenin ölçümü için çeşitli yaklaşımlar geliştirilmiştir. Bu ölçüm yöntemleri, büyümenin sadece ekonomik performansını değil, aynı zamanda sosyal ve çevresel etkilerini de değerlendirmektedir. Dünya Ekonomik Forumu'nun kapsayıcı kalkınma düzeyini değerlendirme metodolojisi gibi uluslararası değerlendirme çerçeveleri de kullanılmaktadır. Bu çerçeveler, ülkelerin kapsayıcı büyüme performanslarını karşılaştırmalı olarak analiz etme imkânı sağlamaktadır (Fofana vd., 2023; Ranieri & Ramos, 2013).



Şekil 2. Afrika Ülkelerinin 2023 Yılı İnsani Gelişme Endeksi ve Kişi Başına Düşen Millî Gelir Haritası.

Kaynak: Dünya Bankası veri tabanından elde edilen veriler ile yapay zekâ yardımı ile hazırlanmıştır.

Şekil 2'de Afrika kıtasında yer alan ülkelerin 2023 yılı insani gelişme endeksi değerlerine göre renklendirilmiş haritası bulunmaktadır. Kuzey Afrika Ülkeleri (Fas, Cezayir, Tunus, Libya ve Sudan) ve Mısır'ın insani gelişme endeksi 0,70-0,80 arasında yer alırken, Sahra Altı Ülkelerin endeks değeri ortalama 0,40 civarındadır. Kişi başına düşen millî gelir seviyelerinin gösterildiği haritaya bakıldığında, kişi başına düşen gelirdeki artışla insani gelişme endeksindeki artışın paralellik gösterdiği görülmektedir.

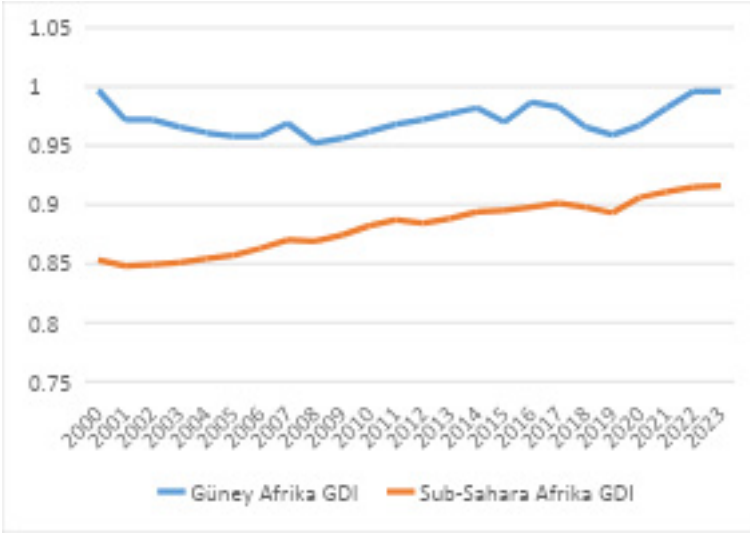
İnsani gelişme endeksi ve endeksin alt bileşenleri olan okullaşma oranı, kişi başına düşen millî gelir, doğumda yaşam beklentisi değişkenleri de kapsayıcı

büyümenin önemli göstergeleridir. Tablo 1’de Güney Afrika ve Sub-Saharan Afrika ülkelerine ait değerler gösterilmiştir.

Güney Afrika					Sub-Saharan Afrika Ülkeleri				
Yıllar	Okullaşma Oranı (Yıl)	Doğumda Yaşam Beklentisi (Yıl)	Kişi Başına Düşen Milli Gelir (2021 PPP\$)	İnsani Gelişme Endeksi	Yıllar	Okullaşma Oranı (Yıl)	Doğumda Yaşam Beklentisi (Yıl)	Kişi Başına Düşen Milli Gelir (2021 PPP\$)	İnsani Gelişme Endeksi
2000	7.463	58.368	9643.376	0,62	2000	4.059	51.343	2915.016	0,44
2001	7.670	57.161	9799.470	0,61	2001	4.163	51.690	2961.974	0,44
2002	8.520	55.580	10186.529	0,61	2002	4.326	52.081	3103.896	0,45
2003	8.760	54.245	10416.779	0,61	2003	4.437	52.623	3164.710	0,46
2004	8.819	53.963	10915.211	0,61	2004	4.542	53.240	3295.709	0,47
2005	8.899	53.914	11420.738	0,62	2005	4.581	53.796	3408.020	0,47
2006	8.949	54.220	12080.354	0,62	2006	4.679	54.399	3553.076	0,48
2007	9.079	54.948	12530.181	0,63	2007	4.779	55.068	3621.547	0,49
2008	9.220	55.982	12894.922	0,64	2008	4.905	55.727	3678.806	0,50
2009	9.600	57.413	12859.283	0,66	2009	4.997	56.166	3731.773	0,50
2010	9.670	58.886	13291.541	0,67	2010	5.040	56.982	3880.141	0,51
2011	9.689	60.602	13729.975	0,68	2011	5.109	57.593	3973.525	0,52
2012	9.930	61.737	13677.739	0,70	2012	5.197	58.141	4058.958	0,52
2013	10.039	62.388	13774.908	0,71	2013	5.274	58.590	4143.037	0,53
2014	10.149	63.184	13671.411	0,71	2014	5.392	58.845	4292.525	0,53
2015	10.229	64.053	13653.949	0,72	2015	5.554	59.256	4345.817	0,54
2016	10.184	64.749	13635.835	0,72	2016	5.661	59.676	4274.989	0,54
2017	10.140	65.422	13862.177	0,73	2017	5.688	60.067	4274.309	0,55
2018	10.755	65.726	13839.463	0,73	2018	5.789	60.656	4293.870	0,55
2019	11.369	66.071	13882.014	0,74	2019	5.948	60.989	4324.221	0,56
2020	10.554	65.150	13241.775	0,72	2020	5.944	61.062	4205.054	0,56
2021	11.609	62.010	13901.697	0,72	2021	6.140	60.619	4261.973	0,56
2022	11.609	65.454	13819.634	0,74	2022	6.175	61.815	4304.782	0,57
2023	11.609	66.139	13693.988	0,74	2023	6.163	62.506	4351.554	0,57

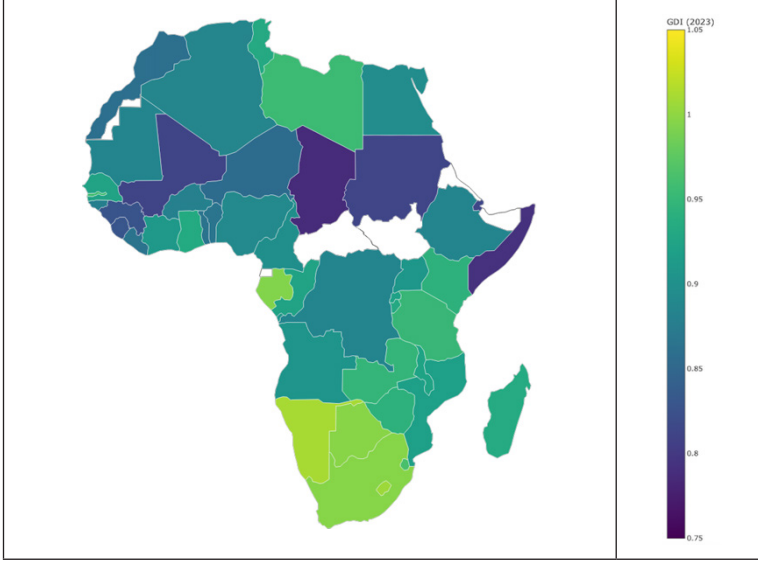
Tablo 1. İnsani Gelişme Endeksinin Alt Bileşenlerini Oluşturan Göstergeler.
Kaynak: Birleşmiş Milletler Kalkınma Programı (UNDP)

Tablo 1’de 2000-2023 yılları arası Güney Afrika ve Sahra Altı Afrika ülkelerinin okullaşma oranı (yıl), doğumda yaşam beklentisi (yıl) ve kişi başına düşen milli gelir seviyeleri gösterilmiştir. Güney Afrika’nın diğer Afrika ülkelerinden olumlu yönde ayrıştığı görülmektedir.



Grafik 2. Güney Afrika ve Sahra Altı Afrika Ülkelerinin Cinsiyet Gelişim Endeksi.
Kaynak: Birleşmiş Milletler Kalkınma Programı (UNDP).

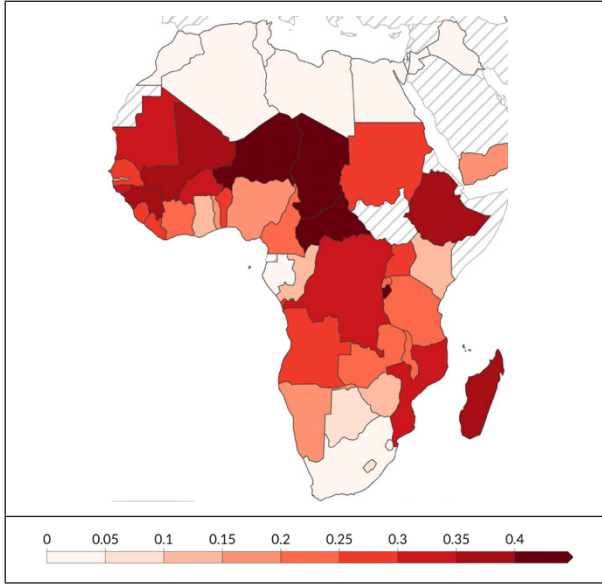
Grafik 2’de Güney Afrika ve Sahra Altı Afrika Ülkelerinin 2000 yılı sonrası cinsiyet gelişim endeksi (GDI) verileri gösterilmiştir. Birleşmiş Milletler Kalkınma Programı’na göre cinsiyetler arasındaki eşitlik arttıkça endeks değeri 1’e yaklaşacaktır. Değerin 1’den küçük olması eşitliğin erkek lehine, 1’den büyük olması kadın lehine eşitliğin bozulduğunu gösterir. Güney Afrika’nın GDI değeri yaklaşık 1’e yakınsarken; Sahra Altı Afrika Ülkelerinde yıllar içinde eşitliğin daha adil olduğu ancak Güney Afrika’nın oldukça gerisinde olduğu görülmektedir. Şekil 3’te Afrika ülkelerinin 2023 yılına ait GDI değerleri verilmiştir. Sahra Altı Afrika Ülkelerinde cinsiyetler arasındaki gelişmişlik farklılığının erkek lehine geliştiği görülmektedir. GDI değerindeki eşitlik barometrisinin bozulması eğitim, sağlık ve gelirden benzer fırsatların bulunmadığı ve erişimin farklı olduğu, dolayısıyla insan sermayesinin etkin kullanılmadığı anlamına gelmektedir. Bu sadece ekonomik büyümeyi değil, büyümenin kapsayıcılığını da etkileyen önemli bir unsurdur.



Şekil 3. Afrika Ülkelerinin 2023 Yılına Ait Cinsiyet Gelişim Endeks Haritası.

Kaynak: Birleşmiş Milletler Kalkınma Programı (UNDP) veri tabanından elde edilen veriler ile yapay zekâ yardımı ile hazırlanmıştır.

Kapsayıcı büyümenin önemli unsurlarından bir diğeri de yönetişimdir. Belot (2023), 49 Afrika ülkesini kapsayan çalışmasında yönetişim göstergeleri ile ekonomik büyüme oranları arasındaki pozitif korelasyonun bulunduğunu tespit etmiştir (Birleşmiş Milletler Kalkınma Programı, 2025). Daha az gelişmiş Afrika ülkelerinin, daha gelişmiş ülkelere kıyasla daha hızlı bir oranda iyileştiği gözlemlenmektedir. Bu hızlı ilerleme, zaman içinde artan yönetişim oranlarına atfedilmektedir.



Şekil 4. Afrika Ülkelerinin Çok Boyutlu Yoksulluk Endeksi Haritası.

Kaynak: <https://ourworldindata.org/grapher/multidimensional-poverty-index-mpi>

Şekil 4'te Afrika kıtasında yer alan ülkelere ait çok boyutlu yoksulluk endeksi değerleri üzerinden renklendirilmiş harita gösterilmiştir. Endeks değerinin sıfıra yaklaşması yoksulluğun giderek azaldığını ve ortadan kalktığını ifade ederken; değerlerin birine yaklaşması her boyutta yoksulluğun bütün nüfusa dağıldığı anlamına gelmektedir. Kuzey Afrika ülkeleri ile Güney Afrika'nın endeks değerlerinin 0 ile 0,05 arasında değer alırken; Sahra Altı Afrika ülkelerinin endeks değerleri 0,10 ile 0,70 arasında değişim göstermektedir.

Agbatogun vd. (2022) çalışmasında, seçili Afrika ülkelerinde büyümenin kapsayıcılık düzeyini değerlendirmek amacıyla gelir eşitsizliği, ekonomik büyüme ve yoksulluk arasındaki etkileşimi incelemiştir. Yalnızca "Batı" Afrika ülkelerinin büyümenin kısmi kapsayıcılık özelliklerine sahip olduğu; bu nedenle Afrika ülkelerinde büyümenin faydalarının herkese yayılması için dağıtımçı ve büyüme odaklı makroekonomik politikaların sağlanması ve uygulanması, ayrıca kamusal altyapıya yatırım yapılması önerilmektedir. Afrika ülkelerinin yarısından fazlası 2030 yılına kadar yoksulluğu yarı yarıya azaltabilmek ve Sürdürülebilir Kalkınma Hedefleri'ne ulaşmak için GSYİH büyümesinin ortalama %6'nın üzerinde gerçekleşmesi gerektiği vurgulanmıştır (Ranieri & Ramos, 2013).

Mali alanın mevcudiyeti, kapsayıcı büyümeyi önemli ölçüde etkiler. Katuka vd. (2023) 28 Afrika ülkesini incelediği çalışmasında mali alan mevcudiyetinin (fiili mali alan ve mali denge) kapsayıcı büyümeyi desteklediğini göstermektedir. Çalışma ayrıca, dijitalleşme ve yönetim göstergelerinin mali alan mevcudiyeti ve kapsayıcı büyüme arasındaki ilişkiyi güçlendirdiğini tespit etmiştir (Independent Communications Authority of South Africa, 2022).

Kapsayıcı büyümenin gerçekleşmesinde yönetim ve mali politikalar elzem olmakla birlikte, bazıları küresel ekonomik koşullar ve ticaret dinamikleri gibi dış faktörlerin de Afrika'nın büyüme yörüngesini şekillendirmede kritik bir rol oynadığını savunmaktadır. Bu bakış açısı, bölgede kapsayıcı büyümeyi anlamak için bütünsel bir yaklaşıma duyulan ihtiyacı vurgulamaktadır.

Güney Afrika'nın Uyguladığı Kapsayıcı Büyümeyi Destekleyen Politika Uygulamaları

Güney Afrika, uyguladığı politikalar ile Sahra Altı Afrika ülkelerinden ve Kuzey Afrika ülkelerinden ayrılmıştır. Uygulanan politikalar kapsayıcı büyüme çerçevesinde değerlendirildiğinde; dört ana başlık karşımıza çıkmaktadır (Hutorov vd., 2019; Mushtaq & Zaman, 2021; Soleh vd., 2022; International Labour Organization, 2024; Presidential Employment Stimulus, 2024).

Sosyal koruma ve insan sermayesi

- *Asgari ücret düzenlemesi*: Ülke çapında asgari Düşük ücretleri tabanda desteklemek ve çalışan yoksulluğunu azaltmak için asgari ücret düzenlemesine gidilmiştir.

- *Sosyal yardımlar ve "sosyal ücret"*: 2025 yılı bütçesinde faiz dışı harcamaların %61 gibi büyük bir bölümü; eğitim, sağlık, sosyal gelişim vb. kalemleri kapsayan sosyal yardım ve ücretlere ayrılmıştır.

- *Evrensel sağlık için sağlık sigortası*: Mayıs 2024'te Ulusal Sağlık Sigortası Yasası imzalandı; kademeli geçişle herkes için erişilebilir sağlık hizmeti hedeflenmiştir.

- *Okullarda beslenme ve ücretsiz okul politikası*: Ulusal Okul Beslenme Programı sayesinde her gün yaklaşık 9,7 milyon öğrenciye yemek sağlanmaktadır; yoksul bölgelerdeki ücretsiz okulların kapsamı genişletilmiştir.

İstihdam ve beceri programları

- *Başkanlık İstihdam Teşviki*: Ekim 2020'den bu yana 1,5 milyonun üzerinde iş/gelir fırsatı üretildi (kamu işleri, eğitim/sağlık destek rolleri, çiftçilere girdi desteği vb.).

- *Genişletilmiş Kamu Çalışmaları Programı*: 20 yılda 14+ milyon iş fırsatı üretildi; düşük gelirli hanelere geçici gelir ve beceri kazandırma aracı.

- Nitelikli göç ve vize reformları

Yapısal/altyapı reformları

1. *Enerji Piyasası Reformu*: Enerji arz güvenliğini artırmak ve özel sektör katılımını teşvik etmek için elektrik üretiminde özel şirketlerin devreye girmesi kolaylaştırıldı. Eskiden gerekli olan üretim lisansı zorunluluğu gevşetildi ya da kademeli olarak kaldırıldı.

2. *Dijital Kapsayıcılık (İnternet Erişimi ve Altyapısı)*: Teknolojik erişimi artırmak ve dijital uçurumu azaltmak için 2022 yılında cep telefonu operatörlerine ve internet sağlayıcılara yönelik büyük bir frekans (spektrum) ihalesi gerçekleştirildi.

3. *Altyapı ve İzin Süreçlerinde İyileştirme (Lojistik, Su, Vize vb.)*: Yatırım ve istihdamın önündeki bürokratik engelleri azaltmak için;

a. Su kullanım izinlerinin verilme süresi kısaltıldı.

b. Çevresel kalite izleme sistemleri yeniden devreye alındı.

c. Yatırımcıların ve nitelikli çalışanların ülkeye girişini kolaylaştıracak vize süreçlerinde iyileştirmelere gidildi.

Sanayi ve rekabet politikaları

KOBİ ve HDP (tarihsel olarak dezavantajlı kişiler) için rekabet kuralları: 2019 değişiklikleriyle alıcı gücü ve fiyat ayrımcılığı düzenlemeleri; baskın firmaların KOBİ/HDP'lerin katılımını engelleyen uygulamalarına karşı daha güçlü yaptırımlar planlandı.

Sektörel “master plan”lar oluşturuldu: Bazı sektörlerde ithalat ikamesi, yerli üretim ve istihdam artışı hedeflenmiş ve 2019 yılından bu yana plan uygulamaya konmuştur.

Siyah Sanayici Programı: Siyah mülkiyetli sanayicilere %30-50 maliyet paylaşımı hibesi ve eş-finansmanla ölçeklenme desteği sağlandı.

Sonuç

Güney Afrika'yı Sahra Altı Afrika ve Kuzey Afrika'dan ayıran "kapsayıcı büyüme" politikaları; sosyal transferlerin ölçeği ve çeşitliliği, istihdam yaratmaya dönük kamusal programların büyüklüğü, rekabete erişimi genişleten düzenlemeler ve enerji-pazar reformlarının derinliği etrafında toplanmıştır.

Güney Afrika, kapsayıcı büyüme açısından politika karmaşasının genişliği ve kurumsallaşma düzeyiyle hem Sahra altı Afrika ortalamasından hem de Kuzey Afrika'dan ayrılmaktadır. Özellikle sosyal transferlerin ölçeği, ulusal ölçekli okul beslenmesi/harçsız okul, geçici istihdam programlarının büyüklüğü ve enerji piyasası reformlarının derinliği belirgin üstünlük alanlarıdır.

Güney Afrika, 2020 sonrası Güney Afrika'nın uyguladığı kapsayıcı büyüme politikaları tek bir araç üzerinden değil, sosyal koruma, eğitim, enerji reformları, istihdam programlarının birlikte işletildiği kapsamlı politika paketleri ile sağlamıştır. Uygulanan politikaların etkilerinin kalıcı olması, (i) enerji/lojistik uygulama hızına, (ii) sosyal yardımların istihdam köprüleriyle entegrasyonuna, (iii) öğrenme kalitesinin ülke geneline yayılmasına ve (iv) fiskal çerçevenin korunmasına bağlıdır. Kapsayıcı büyüme politikaları kapsamında; eğitim ve sağlık sisteminin geliştirilmesi, gelir dağılımının iyileştirilmesi, yoksullukla mücadele, sosyal içerme politikalarının artırılması, sosyal güvenlik sisteminin etkinliğinin artırılması, toplumsal diyalog ve kültürün güçlendirilmesi gibi hedefler belirlenmiştir. Ayrıca bölgesel gelişmişlik farklılıklarını azaltmak için yerel dinamikleri etkinleştiren politikalar geliştirilmiştir.

Sonuç olarak, Güney Afrika'nın kapsayıcı büyüme stratejileri, çeşitli so-
syo-ekonomik göstergeler üzerinden değerlendirilmiş ve yönetim, mali politikalar ve ekonomik performans arasında karmaşık bir etkileşim ortaya konmuştur. Bulgular, bazı ülkeler ilerleme kaydederken, kıta genelinde gerçek anlamda kapsayıcı büyümeye ulaşmada önemli zorlukların bulunduğunu göstermektedir.

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Analyzing Wealth Inequality in Türkiye: The Effects of Monetary Policies and Financial Inclusion

Mahmud İrfan Karaca¹

Abstract

This paper examines how recent monetary policies in Turkey have affected wealth inequality through the channel of financial access. Wealth inequality has widened in Turkey in the context of high inflation, negative real interest rates, and unconventional policy tools such as the Currency-Protected Deposit Scheme (KKM). While asset holders and financially included groups have been able to hedge against inflation and currency depreciation, financially excluded individuals have faced rising living costs and eroding real wealth.

The study is based on an online survey of 270 adult residents in Turkey, designed to capture demographic characteristics, levels of financial literacy, use of financial instruments, and perceptions of economic and monetary policies. Respondents were classified into three main groups: users of conventional financial instruments, users of alternative (often interest-free) instruments, and non-users. Descriptive analysis is used to compare wealth outcomes and perceived advantages across these groups.

The findings show that both conventional and alternative instrument users report higher rates of wealth preservation and accumulation than non-users, with users of conventional tools enjoying the largest perceived advantages. Non-users—many of whom cite religious or ethical concerns, lack of savings, or distrust in the system—are more likely to report economic disadvantage. Perceptions of increased wealth inequality are especially strong among participants with higher income, higher education, and high financial literacy; 74.4% of all respondents' state that recent economic and monetary policies have widened the wealth gap.

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The results highlight the indirect role of monetary policy in amplifying wealth inequality by interacting with uneven financial access and cultural-religious preferences. The paper argues that more inclusive financial frameworks, expanded Islamic finance options, and targeted financial literacy initiatives are essential to mitigate policy-induced disparities in wealth distribution.

Keywords: Wealth Inequality, Monetary Policies, Financial Access, Financial Inclusion, Socio-Economic Disparities

Introduction

Background and Context

Wealth inequality has become one of the most pressing socio-economic challenges of the twenty-first century. Deep and persistent gaps in wealth accumulation undermine social cohesion, restrict economic mobility, and exacerbate structural injustices (Piketty, 2014; Stiglitz, 2012). In the literature, wealth inequality is defined as the unequal distribution of assets –such as property, financial assets, and other forms of capital– across individuals or households and is often viewed as more persistent and harder to correct than income inequality (Piketty, 2014).

Over the past two decades, global wealth has become increasingly concentrated. According to Credit Suisse's *Global Wealth Report 2022*, the top 1% of the world population holds nearly half of global wealth, while the poorest half accounts for only a very small share (Credit Suisse, 2022). This pattern is closely related to the fact that returns on capital –including interest, dividends, and capital gains– tend to exceed overall economic growth rates, thereby allowing existing wealth holders to accumulate assets at a faster pace than the rest of society (Piketty, 2014). One key mechanism behind this process is unequal access to financial instruments: affluent individuals benefit disproportionately from financial markets, whereas low-income groups often remain excluded from formal financial systems and the opportunities they provide (Banerjee & Duflo, 2019).

Wealth inequality thus poses serious risks not only for individual well-being but also for macroeconomic performance and political stability. It is associated with slower economic growth, heightened social tensions, and a greater likelihood of political capture by wealthy elites (Stiglitz, 2012; Banerjee & Duflo, 2019). These concerns have intensified the academic and policy interest in understanding how institutions, policies, and financial structures shape the distribution of wealth within and across societies.

In this broader debate, the interaction between monetary policy, financial access, and wealth inequality has received growing yet still insufficient attention. Monetary decisions influence interest rates, credit conditions, and asset prices, and therefore may systematically favor those with greater access to financial instruments. How this channel operates in practice, and how it interacts with cultural and religious preferences regarding finance, remains an open empirical question-especially in emerging economies.

Research Problem and Importance

Despite a rich literature on wealth inequality and financial inclusion, the specific ways in which monetary policies affect wealth inequality *through* financial access remain underexplored. Existing studies primarily focus on macro-level outcomes of monetary policy, such as growth, inflation, or financial stability, while devoting less attention to the micro-level distributional consequences across different groups of households (Bernanke & Gertler, 2001). Moreover, relatively few studies examine how cultural and religious sensitivities shape financial behavior and thereby mediate the effects of monetary policy.

This paper addresses these gaps by asking a central research question: Do recent monetary policies in Turkey disproportionately benefit individuals with access to financial instruments, thereby widening wealth inequality compared with those who remain financially excluded?

The study focuses on the *outcomes* of monetary policy rather than on the motivations or political economy of policy-making. Debates about central bank independence, or the underlying objectives of specific policy decisions, remain beyond the scope of this research. Instead, the analysis concentrates on how policy instruments – such as negative real interest rates, credit expansion, and the Currency-Protected Deposit Scheme – have translated into differential opportunities and outcomes for various groups.

Turkey provides a particularly relevant case for analyzing these issues due to its socio-economic diversity, high and rising levels of wealth inequality, and the implementation of unconventional monetary policies in recent years. Understanding how these policies have interacted with financial access is crucial not only for the academic literature but also for designing more equitable policy frameworks in similar emerging-market contexts.

Hypotheses

Turkey is among the countries where wealth is highly concentrated: recent estimates show that the top 10% of households hold around 70% of total wealth, while the bottom 50% hold less than 5%. This structural inequality suggests that access to financial instruments may play a significant role in how households experience monetary policy outcomes. Based on this framework, the study formulates three hypotheses:

H1: Individuals who use conventional financial instruments (such as interest-bearing deposits, bonds, or investment accounts) are more likely to report higher levels of wealth preservation or accumulation during recent monetary policy cycles than those who do not use any financial instruments.

H2: Individuals with limited or no access to financial services –due to lack of savings, low financial literacy, distrust, or structural barriers– are more likely to experience real wealth losses during periods of high inflation and negative real interest rates.

H3: Cultural and religious sensitivities, especially the avoidance of interest-bearing products, moderate the effects of monetary policy on wealth outcomes; users of alternative/participation finance instruments are expected to report smaller perceived gains compared with users of conventional interest-bearing tools.

Contextual Background: The Case of Turkey

In Turkey, recent monetary policies have had significant impacts on wealth distribution. Following the reduction of interest rates after 2019, high inflation and credit expansion allowed individuals with access to financial instruments to obtain cheap loans and accumulate wealth with minimal risk. This environment fueled demand inflation, disadvantaging those without access to financial instruments as their real wealth diminished due to inflation. The KKM scheme further benefited those who could protect their wealth against currency depreciation while earning interest, creating a low-risk environment for wealth accumulation. In contrast, the recent increase in interest rates post-2023 has provided high returns on deposits, favoring those with substantial savings and further marginalizing those without financial access.

Significance of the Research

This study offers several important contributions to the growing literature on monetary policy and wealth inequality. First, it provides a micro-level perspective on how recent monetary policies in Turkey –characterized by high inflation, negative real interest rates, and unconventional instruments such as the Currency-Protected Deposit Scheme– have produced unequal outcomes across different segments of society. While most existing studies focus on aggregate macroeconomic indicators, this research highlights how individuals with varying levels of financial access experience these policies in markedly different ways.

Second, the study brings attention to the role of cultural and religious preferences in shaping financial behavior. A substantial portion of the population avoids interest-bearing financial products, which limits their participation in wealth-protecting mechanisms. By examining the experiences of both conventional and alternative (often interest-free) financial instrument users, the study contributes to a deeper understanding of how socio-cultural factors interact with economic policy environments.

Third, the findings carry important policy implications. The results suggest that monetary policies can unintentionally amplify wealth inequality when access to financial instruments is uneven or restricted. Expanding financial inclusion, diversifying Islamic finance products, and strengthening financial literacy are essential steps for ensuring that policy outcomes do not disproportionately benefit only financially integrated groups. As such, the study provides valuable insights for policymakers in Turkey and other emerging economies confronting similar structural challenges.

Methodology

This study employs a quantitative, survey-based research design to examine how financial access influences individuals' experiences of monetary policy and perceived wealth outcomes in Turkey. The data were collected through an online structured questionnaire administered to 270 adult residents of Turkey. Participation was voluntary, and respondents provided information on their demographic characteristics, financial literacy levels, use of financial instruments, and perceptions of recent economic and monetary policies.

To capture heterogeneity in financial behavior, participants were classified into three distinct groups: (1) users of conventional financial instruments (e.g., interest-bearing deposits, investment accounts), (2) users of alternative or

interest-free instruments (e.g., participation accounts, gold-based savings), and (3) non-users with no engagement in financial instruments.

The survey included Likert-scale items assessing perceived wealth changes, economic differentiation, and the impact of monetary policies on inequality. Descriptive statistical methods were used to compare wealth outcomes, perceived advantages/disadvantages, and policy evaluations across the three groups. This approach enables a micro-level analysis of how financial integration, or the lack thereof, shapes individuals' economic experiences during periods of unconventional monetary policy.

Result and Discussion

The survey results reveal clear differences in economic experiences and perceived wealth outcomes across the three financial access groups. Users of conventional financial instruments reported the most favorable outcomes: 47.3% stated that recent economic conditions created a positive differentiation for them, and 43% indicated that they either partially increased or fully preserved their wealth. This group benefited the most from monetary policy mechanisms such as high interest rates and access to asset-protecting instruments.

Users of alternative or interest-free instruments also reported relatively positive outcomes, though to a lesser extent. More than half (56.2%) stated that they experienced positive differentiation, and a combined 54.3% reported either significant or partial increases in their wealth. These results indicate that participation in the financial system –even through non-interest instruments– provides a measurable degree of economic protection, though the returns remain lower compared to conventional users.

In contrast, non-users of financial instruments showed the weakest economic outcomes. Approximately one-third (34.9%) reported that they were negatively differentiated by recent economic conditions. This group was the most exposed to inflation, currency depreciation, and rising living costs, reflecting the vulnerability created by financial exclusion. Many respondents in this group cited lack of savings, low financial literacy, or religious and ethical concerns as reasons for not participating in financial markets.

Perceptions about the broader effects of monetary policy were also highly polarized. Across all participants, 74.4% stated that recent monetary and economic policies widened the wealth gap in Turkey. This perception was strongest among individuals with higher income, higher education, and high financial

literacy-groups that are more directly exposed to financial markets and more aware of policy outcomes. These patterns align with the study's hypotheses, demonstrating that financial access shapes both economic experiences and the interpretation of policy effects.

Overall, the findings indicate that monetary policy interacts with financial access in ways that systematically advantage financially integrated households while leaving excluded groups vulnerable to macroeconomic volatility. These results highlight the distributional consequences of policy choices, particularly in contexts where cultural and religious preferences influence the use of financial instruments.

Conclusion

This study demonstrates that financial access plays a central role in shaping how individuals experience the outcomes of recent monetary policies in Turkey. The results show that users of conventional financial instruments were the most successful in preserving or increasing their wealth during periods of high inflation and unconventional policy interventions, while users of alternative interest-free instruments experienced moderate gains. In stark contrast, individuals who remain outside the financial system faced the greatest vulnerability, reporting higher levels of economic disadvantage and real wealth erosion.

These findings highlight the distributional consequences of monetary policy in an environment where financial access is uneven and where cultural and religious preferences influence financial behavior. When monetary tools disproportionately benefit those with the ability and willingness to utilize financial instruments, wealth inequality is reinforced rather than mitigated. The widespread perception among respondents –nearly three-quarters– that recent policies have widened the wealth gap further underscores this dynamic.

The results suggest that policymakers must consider the interaction between monetary policy and financial inclusion when designing economic strategies. Expanding access to savings and investment tools, diversifying Islamic and interest-free financial products, and improving financial literacy are essential steps for ensuring that policy outcomes do not systematically disadvantage financially excluded groups. Turkey's experience offers valuable lessons for other emerging economies facing similar structural and socio-cultural challenges, demonstrating the need for more inclusive financial frameworks to support equitable wealth distribution.

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The Relations Between Trade Volume and Political Relations: Example of Türkiye and Ethiopia

Ahmet Fatih Kaya¹

Abstract

The relationship between political relations and mutual trade is one of the most critical topics for policymakers. It would not be surprising to see that developing relations between countries enables the development of international trade. This paper posits that developing political relations enables an increase in trade volume. By signing agreements involving military cooperation, having reciprocal visits entails national companies to trade with new partners, as well as attracting the interest of investors. In this context, Türkiye's international relations with Ethiopia are examined, and its effects on the trade volume will be investigated. While conducting this analysis, available data will clarify our premises. The findings reveal that developing political relations has an impact on increasing trade volume between countries.

Keywords: International Relations, International Trade, Military Cooperation, Mediation Role, Trade Volume

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Introduction

The article consists of two main parts and a conclusion. Part A investigates the political relations of Türkiye with Ethiopia from 2005 to 2024, and Part B investigates the trade volume between Ethiopia from 2002 to 2024.

A. Political relations will be evaluated in 3 criteria. Their presence is a sign of good relations, according to our assumption.

- Military Agreement and Military Trade
- Other Agreements, Formal Visits, and Institutions
- Mediation Role

B. Trade volume will be evaluated in the interval 2002-2023.

After the political relations are evaluated by the criteria, it will be decided how the political relations have been going. Then, the trend in the trade volume will be evaluated, and it will be decided how the international trade has been going. If both dimensions have resulted positively or both have resulted negatively, it could be deduced that there has been a linear relationship between international relations and international trade of Türkiye and Ethiopia. However, if there is a contradiction between the results, then it could be said that there are no relations between these two findings.

Türkiye's Political Relations with Ethiopia

Since the beginning of the 21st century, Türkiye has tried to enhance its relations with African countries, dependent on mutual benefit. Because Africa carries a huge population, hydrocarbon mines, and geopolitical importance (for example, the Horn of Africa which is one of the most important trade routes), Türkiye's interest in Africa, especially in the Sub-Saharan region, has significantly increased. The number of Turkish Assembly members increased from 12 in 2002 to 44 in 2024 (T.C. Dışişleri Bakanlığı, n.d.). Even though Türkiye's African Initiative was established in 1998, the relations were enhanced when Türkiye was accepted as a "strategic partner" and observer member of the African Union in 2008. In 2005, the Turkish government designated the year as "Year of Africa" (Ozkan, 2008).

The Türkiye-Ethiopia relationship should be evaluated in the context of the preceding paragraph: Türkiye tries to establish strategic partnership relations with African countries, especially with the sub-Saharan region, which carries huge strategic importance (Telci & Yimer, 2024). Turkish interest in Ethiopia stems from its strategic location, which is very close to the Horn of Africa, and its economic growth (Ethiopia had nearly half of the foreign direct investment of the whole of

Africa in 2017), (Abdullahi & Abdirahman, 2023) and its huge population that promises huge economic potential. To provide a further glance at the political relations between Türkiye and Ethiopia, the bilateral relations will be evaluated by the criteria mentioned.

• **Military Agreement and Military Trades**

Military cooperation is a very significant indicator of strategic partnership, especially if the cooperation includes high-technology weapons (Czechowska, 2013). The country that has the capacity to produce high-technology arms sells the arms just to their reliable partners, that is not expected to be involved in a military conflict with them. Thus, it can be said that the trade of high-technology arms is an indicator of partnership and alliance.

The drones of Türkiye produced by Baykar Technology company are a brand-new, high-technology military vehicle that has had a groundbreaking effect on the battlefield. For instance, it has been very effective in the wars of Karabagh and the Russian war. The selling of these technologies is dependent on the criteria of trust for Türkiye. Even though there is no formal explanation about whether there have been any sales of these weapons, according to the media and news, Türkiye sold Baykar drones to Ethiopia (Coskun, Spicer, ve Toksabay 2021). Also, one of the formal institutions (*Yurtdışı Türkler ve Akraba Topluluklar Başkanlığı*) of Türkiye's Ministry of Foreign Affairs mentioned the usage of TB-2 drones in Ethiopia (*Yurtdışı Türkler ve Akraba Topluluklar Başkanlığı*, 2022). In another announcement of the Turkish Ministry of Foreign Affairs, the sale of military equipment and vehicles is confirmed (*Stratejik Araştırmalar Merkezi*, 2024).

Military agreements are also very significant indicators of partnership. Most military agreements include sales of weapons, technical support agreements, and deployment of military bases. In August 2021, Türkiye and Ethiopia signed an agreement of military cooperation (*Middle East Monitor*, 2021). That is also a very significant indicator of developing relations.

• **Formal Visits and Institutions**

Formal visits, especially if they are at the upper level, such as visits of presidents, ministers, and prime ministers, can be an indicator of good relations between states. In formal visits, the operations of national institutions are indicators of positive relations. If the national institutions, charities, and companies of one state operate in another state, that state signs the diplomatic relations of these two states at a level that prevails inter-organizations. Lastly, agreements such as trade agreements, agreements of alliance, or free trade agreements, obviously, are a sign of good relations.

After the year 2005, Türkiye adopted a policy of close relations with Africa. Türkiye-Ethiopia relations developed with the opening of the Turkish Embassy in 2006 in Addis Ababa. In the following years, Türkiye was accepted as a strategic partner by the government of Ethiopia. After the opening of the embassy, there have been mutual visits from both sides at the upper levels. Turkish Prime Minister Erdogan visited Ethiopia twice while he was in office, and after Erdogan became President, he made his first sub-Saharan visit to Ethiopia in 2015. Ethiopian President Wirtu visited Türkiye twice in two years, and there have been several visits by ministers (T.C. Dışişleri Bakanlığı, t.y.)

Turkish public institutions have been very active since 2005. Turk Development and Cooperation Agency (TİKA), which is a public organization attached to the Turkish Foreign Ministry, started to operate in Addis Ababa in 2005. Maarif Charity, an education charity attached to the Turkish presidency, started its duty in 2018, and it provides education to 3,400 students in Ethiopia in its 18 schools (Türkiye Maarif Vakfı, 2022).

• **Mediation Role**

The role of mediation is considered a very powerful indicator of positive relations, especially if there is no direct harm to the mediator state. For the mediator state, it is a sign of trust and fairness from other states, and for mediated states, it is a sign of good intentions. Mostly, states that are in conflict with another state do not accept mediation of a state with which it does not have very good relations, which protects its interests. Thus, if a state mediates a conflict between two other states, there are presumed to have trustworthy relations.

Ethiopia had a conflict with Somalia about Ethiopia's recognition of Somalia's secessionist region, Somaliland, in January 2024. With that attempt, Ethiopia aimed to break its landlocked status that prevents it from reaching the open sea, and force Ethiopia to make its trade through Somalia's ports. Naturally, Ethiopia's attempt to assert its sovereignty was considered an attack on its territorial integrity by Somalia. The situation evolved into a crisis, as both sides insisted on their demands.

The crisis between Ethiopia and Somalia was solved by an agreement called the "Ankara Declaration" with Türkiye's mediation efforts. The leaders of two countries and Turkish President Erdogan met in Ankara to reach an agreement and end the crisis. With preceding endeavors of the Turkish Foreign Ministry, FM Hakan Fidan visited both countries several times in 2024 about the crisis, and the countries agreed to reach an agreement with Türkiye's mediator role (T.C. Dışişleri Bakanlığı, 2024).

As seen by military agreements, formal visits, operations of institutions, and lastly the mediation of Türkiye in the Ethiopia-Somalia crisis, Türkiye's political relations with Ethiopia gained momentum in the 2000s, especially after the establishment of Turkish embassies.

The Trade Volume Between Türkiye and Ethiopia

In this part, trade volume between Ethiopia and Türkiye will be evaluated from data of Türkiye's exports, imports, and aggregate of exports and imports for the years. For that analysis, we selected years from 2002 to 2023 to measure the effects of political relations on trade volume. Because there have been rapidly developing political relations between Ethiopia and Türkiye since 2002, before these terms could be considered stagnant for political relations. The period between 2008 and 2020 could be considered as a continuous development of relations, because 2020 was the year the volume of the world economy decreased. Also, in 2021, Ethiopia faced a serious internal crisis in its secessionist region, Tigray. Thus, the period after 2020 is blurred and requires deeper research.

Years	Türkiye Export to Ethiopia	Türkiye's Import From Ethiopia	Aggregate	Change in 5 years term (%)	Change (%)	Mean
2002	32,30	5,70	38,00	242,05	905,7894737	80,36
2003	50,70	10,90	61,60			
2004	77,70	15,70	93,40			
2005	109,00	7,82	116,82			
2006	91,90	0,08	91,98			
2007	146,00	23,90	169,90	186,11		227,36
2008	164,00	24,00	188,00			
2009	229,00	27,10	256,10			
2010	175,00	31,60	206,60			
2011	275,00	41,20	316,20			
2012	395,00	50,00	445,00	101,12		437,84
2013	371,20	72,70	443,90			
2014	336,10	79,10	415,20			
2015	393,30	41,80	435,10			
2016	411,50	38,50	450,00			
2017	347,20	38,80	386,00	98,11		367,46
2019	380,90	51,80	432,70			
2020	231,30	40,50	271,80			
2021	354,30	24,40	378,70			
2022	320,20	20,30	340,50			
2023	306,90	37,30	344,20	101,0866373		342,35

In this graph, the values for Export, Import and Aggregate are values*million dollars .

Table SEQ Tablo*ARABIC 1. The trade volume between Ethiopia and Türkiye from 2002 to 2023. (The table is formed according to TUIK and Trading Economics Data.)

In Table 1, the values for trade between the two countries are listed. There are data Turkish exports to Ethiopia, Turkish imports from Ethiopia, the Aggregate of Export and Import, the percentage of change of aggregate in a 5-year term, the percentage of change of 22 every year, and the mean over 5 years. Since annual change could be very radical, evaluating the changes in 5 years would provide a more realistic understanding. five years is called a “term”.

When the first 5-year term is evaluated, it is seen that trade volume is much less than that of others (80.36 million). In these years, the relations were much more stagnant compared to the following terms. If you consider that the Turkish Embassy was opened in 2006, it could be expected that the volume will increase in the follow.

Evaluation of the second term shows a radical increase in the mean of the trade volume from 80,36 million in the first term to 227,36 million in the second term. After the establishment of the Turkish Embassy, there have been a lot of high-ranking visits in that term. Also, with the endeavor of governments, Türkiye Ethiopia Business forum was established in that term, in 2009. (see Table 1)

The third and fourth term was the duration during which the political relations were highly developed. In this term, national airways started flights between countries, and cooperation that enables investors to initiate was enhanced. The number of Turkish companies operating in Ethiopia has increased significantly; while the number was 1 in 2003, it reached 200 in 2019 (T.C. Dışişleri Bakanlığı, t.y.). Even though the trade volume was highly affected by the Covid-19 pandemic, the fourth term was concluded with a small shrinkage in mutual trade (There is a 0,0189 shrinkage in 2021 compared to 2017). (see Table 2)

2017	347,20	38,80	386,00
2021	354,30	24,40	378,70

Table 2. The beginning and the end of the 4th term.

In the fifth term, we can see a slight growth in the trade volume (1,08%). The reason for the smallness of the growth of the fifth term compared to the second and third term can stem from that: before 2006, the political relations were fully stagnant, political attempts from both sides were triggering big effects, such as opening embassies and mutual visits, which had enabled trade to grow. (see Table 3: the speed of the change) However, the following terms require more attention for the continuation of trade.

Table 3: Comparison of the first and seconterms

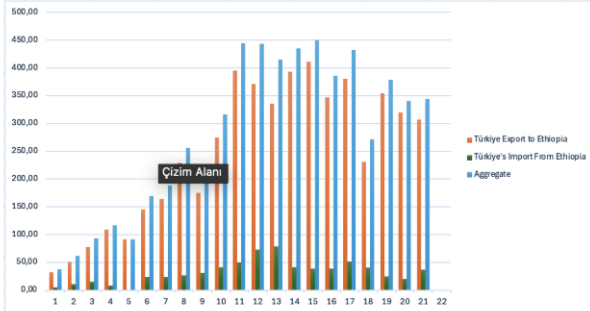


Figure SEQ Figure 1* ARABIC 1: The trade volume of the two countries in a bar chart. (the value*million dollar)

Years	Mean
2002	80,36
2003	
2004	
2005	
2006	
2007	227,36
2008	
2009	
2010	
2011	

Table 3. Comparison of the first and seconterms.

Conclusion

To evaluate the whole term, we see 9.05 times increase in trade volume from 2002 to 2023. That is an enormous growth for such a short duration (see Figure 1). From our findings the term, shows political relations between the two countries to be highly developed with the opening of embassies, agreements of defense and trade, mutual visits, and mediation of Türkiye in the crisis of Ethiopia-Somalia. When we take both trade volume and political relations, we deduce that there is a linear relation between trade volume and political relations.

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Kapsayıcı Büyüme: Afrika'da Normatif Büyüme Politikaları

Lütfü Şimşek¹

Giriş

Ekonomik gelişme, güncel iktisat yazınında yaygın olarak nicel verilerle ölçülebilen bir kavram olarak kabul edilmektedir. Kapsayıcı büyüme, son yıllarda ekonomik gelişmenin sadece nicel verilerle değerlendirilmesine yönelik eleştirilerin artmasıyla birlikte kalkınma literatürünün merkezine yerleşmiştir. Kapsayıcı büyüme yaklaşımı ekonomik gelişmenin yalnızca teknik çıktılarla açıklanamayacağını; gelişmenin toplumsal, siyasal, kültürel ve etik boyutlarının da olduğunu savunmaktadır. Bu yazıda Afrika'da son dönemlerde uygulanan büyüme politikaları kapsayıcı kalkınma perspektifinden eleştirel bir değerlendirmeye tabi tutulacaktır.

Ekonomik büyüme refah artışı için zorunlu olmakla birlikte tek başına yeterli bir faktör değildir. Kapsayıcı büyüme yaklaşımı geleneksel milli gelir gibi göstergelerin ötesine geçerek daha geniş bir yaşam standardı anlayışı ortaya koyar (OECD, 2015). Bu yaklaşım çerçevesinde;

a) **Çok boyutluluk**, insanı esenlik kavramı doğrultusunda ruhsal ve bedensel bir bütünlük olarak kabul ederek bireysel refahı, gelirin yanı sıra insan onuru ve sosyal kültürel unsurlarla birlikte değerlendirir;

b) **Servet paylaşımı**, milli gelirin toplumsal kesimler arasındaki bölüşümüne odaklanır,

c) **Siyasal katılım**, ekonomik fırsatlara erişimi belirleyen demokratik süreçlere bakılır.

Birleşmiş Milletler Kalkınma Programı (UNDP) kapsayıcı gelişmeyi hem bir çıktı hem de bir süreç olarak değerlendirirken; karar alma süreçlerinin herkeşe açık olmasına ve büyümeye katkı sunmada fırsat eşitliği ve zenginliklere eşit erişime vurgu yapar (OECD, 2015, s8) Afrika Kalkınma bankası (AfDB) Kapsayıcı büyümeyi, daha geniş bir nüfus kesimine, bölgelere veya ülkelere sürdürülebilir

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sosyoekonomik fırsatlara erişim imkânı sunan; kırılğan grupları koruyan; tüm bunları ise adalet ve siyasal çoğulculuk ortamında gerçekleştiren ekonomik büyüme biçimi olarak tanımlanmaktadır. (Monga, C. vd, 2015, s158)

Bu yaklaşımlar bütüncül olarak değerlendirildiğinde; kapsayıcı büyümenin yalnızca ekonomik bir hedef olmadığı; adalet, eşitlik ve iyi yönetim ilkelerini içeren kurumsal bir dönüşüm stratejisi olduğu ortaya çıkmaktadır. Nüfusun farklı kesimlerini ve bölgelerini dikkate alan, sürdürülebilir ekonomiyi temele alırken sosyo-ekonomik fırsatlara erişim eşitliği üzerinde duran bu yaklaşımda dezavantajlı grupların korunmasına önem verilmekte ve insan onurunu koruyan iyi yönetim politikalarının hayata geçirilmesinin önemi üzerinde durulmaktadır.

Ancak Afrika'nın yüksek büyüme potansiyeline rağmen, kapsayıcı büyümenin önünde çok önemli engeller mevcuttur: Zayıf yönetim ve henüz kökleşmemiş kurumlar; yolsuzluk, nepotizm, hesap verilebilirlik gibi problemler resmî kurumların temel karakteristikleri olmaya devam etmektedir. (Mulinda, 2022)

Ancak Afrika'nın yüksek büyüme potansiyeline rağmen kapsayıcı kalkınma yolunda önemli engeller mevcuttur. Zayıf yönetim, kurumsal kökleşme eksikliği, yolsuzluk, nepotizm ve etnik kayırmacılık ciddi sorun alanlarıdır (Mulindwa, 2022). Yerel toplulukların karar alma süreçlerinden dışlanması, sosyal haklara erişimde eşitsizliklerin kökleşmesine yol açmaktadır. Ayrıca doğal kaynak bağımlılığına dayalı büyümenin istihdam yaratmaması, yoksulluğun özellikle kırsal alanlarda derinleşmesine neden olmaktadır. Kentleşmenin hızlanması ise mekânsal eşitsizlikleri artırmış ve sosyal dışlanmayı kalıcı hale getirmiştir (Monga vd., 2015).

Teorik Çerçeve: Yetenekler Yaklaşımı ve Etik Kalkınma

Amartya Sen (1999), eşitsizliklerin keskin olduğu ülkelerde kalkınmayı, ekonomik göstergelerin ötesinde insan ve özgürlük zeminine oturtmak ister. Ona göre ekonomik büyüme gelir artışı ile değil, insanların yaşamak istedikleri hayatı yaşayabilme kapasiteleriyle ölçülür. Sen'in **yetenekler yaklaşımı** ekonomik gelişmeyi, bireylerin temel haklara, sosyal hizmetlere ve siyasal özgürlüklere erişim imkanlarına göre değerlendirir.

Daha sonra Martha Nussbaum (2011) ise bu yaklaşımı normatif bir boyuta taşıyarak bireylerin “anamlı ve onurlu bir hayat” için sahip olması gereken on temel yetkinliği sistematik biçimde ortaya koymuştur. Bedensel sağlık, eğitim, düşünce özgürlüğü, toplumsal katılım ve çevresel sürdürülebilirlik gibi kavramlar kalkınmanın bir parçası olmuştur. Yetenekler yaklaşımı ile kapsayıcı büyüme kuramını birlikte ele aldığımızda; Kalkınma yalnızca ekonomik

çıktıları artırmaya değil, fırsat eşitsizliklerini gidermeye ve toplumsal katılımı genişletmeye dönük bir hüviyet kazanır.

Yukarıda da belirttiğimiz gibi Kapsayıcı Büyüme yaklaşımı, ekonomik performansı makro büyüklüklere bakarak değil, geniş toplumsal katılım ve fırsat eşitliği temelinde değerlendirmektedir. Yetenekler yaklaşımı bu doğrultuda kapsayıcı büyüme için etik bir temel inşa etmekte ve bireylerin katılımları ve fırsat eşitliği için bir zemin oluşturmaktadır. Çünkü bireylerin ekonomik çıktıdan pay almanın ötesinde, eğitim, sağlık, sosyal güvenlik ve siyasal katılım haklarına sahip oldukları kabul edilmektedir.

Sen ve Nussbaum'un önerdiği yetenekler yaklaşımı kapsayıcı büyüme teorisyle entegre edildiğinde kimin ne kadar kazandığı ya da ne kadar gelir elde ettiği soruları yerini birey hangi olanaklara erişebiliyor, hayatını özgürce seçebiliyor mu gibi sorulara bırakır.

Uygulama Sorunları

Afrika kıtasında son yıllarda büyüme rakamlarında gelişmeler dikkat çekse de bu büyümenin kapsayıcı olduğunu söylemek mümkün değildir. Etiyopya, Mozambik ve Nijerya örneklerinde toplam çıktı miktarında gözlemlenen artışlara rağmen, bu ülkelerde genç işsizliği ve kadınların ekonomik katılımı gibi alanlarda gelişmelerin son derece kısıtlı olduğu göze çarpmaktadır (World bank, 2019). Bu da bize büyümenin niceliksel göstergelere yoğunlaşırken toplumsal gelişmelere du-yarsız kaldığını göstermektedir.

Gelir dağılımı ve fırsat eşitliği, makroekonomik istikrara feda edilmekte; kalkınma planları sektörel verimlilik artışı gibi konulara odaklanmaktadır. Bu nedenle büyüme dar bir kesimde yoğunlaşırken gelirin geniş toplumsal gruplara yayılması gecikmekte ve büyümenin yarattığı gelirden geniş kitleler faydalanamamaktadır.

Bu durum bize Afrika kıtasında kapsayıcı büyüme konusunda alınması gereken yolun ne kadar uzun olduğunu göstermektedir. İstihdam yaratmayan büyüme rakamları uzun vadede yeni sorunlara işaret etmektedir. Özellikle genç nüfus arasında artan işsizlik geleceğe dair problem birikmesi olarak görülmektedir. Cinsiyetler açısından baktığımızda kadınların işgücüne katılımı küresel ortalamasının hayli altındadır. Örneğin, **Ortadoğu ve Kuzey Afrika (ODKA)** bölgesinde, kadınların işgücüne katılım oranı dünya ortalamasının oldukça gerisinde: Dünya ortalaması %51 iken, ODKA'da bu oran %21 civarındadır. Bu durum kurumsal reformlar yapılmadığı takdirde sosyal uyumun bozulması ve uzun vadede sürdürülebilirliğin zayıflaması riskini doğurmaktadır.

Teknokrasi ve Demokratik Temsiliyet Sorunu

Afrika'da kalkınma politikaları IMF ve Dünya Bankası'nın başı çektiği uluslararası kuruluşların teknokratik yaklaşımlarıyla şekillenmektedir. Dolayısıyla kalkınma politikaları yerel katılımı ve yerel duyarlılıklar dikkate alınarak oluşturulmamakta, uluslararası kuruluşların teknokrat yaklaşımları etkili olmaktadır. Karar alma süreçlerinde hakim olanlar, sosyal politikaları da belirlemektedir. Bu durumda Uluslararası kuruluşlar ve dar bir yönetici klik arasında olgunlaştırılan politikalar, kapsayıcı olmanın ötesinde dışlayıcı bir karakter taşımakta, yerel halkların demokratik katılımını dışlayarak kapsayıcı kalkınmanın önüne etik bir problem olarak çıkmaktadırlar (Mkakndawire, 2010).

Karar alma süreçlerinden dışlanan topluluk kesimleri ayrıca doğal kaynaklar temelli bir kalkınma, yani bunların ihraç edilerek paraya dönüştürülmesinden ibaret bir ekonomi anlayışı nedeniyle yerlerinden edilme, tarım alanlarını kaybetme, su ve doğal kaynakların kirlenmesi gibi problemlerle karşı karşıya kalmaktadırlar. Bu sorunlara bağlı olarak doğal kaynak yönetimi ve kentleşme politikaları ciddi toplumsal maliyetler ortaya çıkarmaktadır. Bunun nedeni sosyal uyumun zayıflaması ve yaşanabilir bir çevrenin ortadan kalkması gibi nedenlerdir (Ferguson, 1990)

Bunlara bakarak Teknokratik yönetişimin Afrika'da kapsayıcı büyümenin önündeki önemli engellerden biri olduğunu söylemek mümkündür; çünkü karar alma süreçlerine yerel katılım kapsayıcı büyüme açısından temel öneme sahiptir. Hesap verilebilirliğin şeffaflığın ve katılımcılığın kurumsallaşmadığı, güvence altına alınmadığı bir ülkede, demokratik katılım mümkün olamayacaktır.

Kapsayıcılığın Ölçülmesi

Ekonomik büyümeyle ilişkin rakamların, toplumun farklı kesimlerinin büyümeden eşit ölçüde yararlanıp yararlanmadığını göstermekte yetersiz kalması ve toplumsal refahın hangi yönde geliştiğini gösterememesi gibi nedenlerle kapsayıcılığın ölçülmesi de son derece karmaşık bir sorundur. Kapsayıcılığın ölçülebilmesi için çok boyutlu göstergelerin birlikte entegrasyonu zorunludur. Bu amaçla;

İnsani Kalkınma Endeksi (HDI), doğumda yaşam süresi, eğitim ve gelir düzeylerini kapsayan bütüncül bir çerçeveye sunar

Cinsiyet Eşitsizliği Endeksi (GII), toplumsal cinsiyetin fırsatlara erişimde karşılaştığı eşitsizlikleri tespit etmek üzere oluşturulmuştur. Kadınların sağlık, eğitim ve ekonomik fırsatlara erişimi önündeki engelleri tespit etmeyi amaçlar.

Çocuk ölümleri, okul terki oranları ve siyasal temsil oranları gibi göstergeler ise kapsayıcı kalkınmanın sosyal ve siyasal alanlarda ortaya çıkan eksikliklerini tespit etmeyi amaçlamaktadır.

Bu endeksler, kalkınmayı ekonomik çıktılarla sınırlamadan yaşam kalitesini ve katılım eşitliğini de analiz etmeye mümkün kılmaktadır.

Politika Önerileri: Kapsayıcı Büyüme İçin Stratejiler

Afrika'daki son dönemlerde gözlemlenen büyüme oranlarının kapsayıcı ve sürekli kalkınmaya dönüşebilmesi için şu başlıklarda adımlar atılması gerekmektedir.

İyi Yönetişim ve Demokratik Katılım, sürdürülebilirlik için şeffaflık ve hesap verebilirlik temelli katılımcı yönetim mekanizmalarının kurulması ve bunların da yerel toplulukların katılımına açık olması (UNDP, 2017).

Ekonomide Yapısal Dönüşüm ve Ekonomik Çeşitlendirme, ekonomide istikrar ve sürekli bir büyüme için verimliliğin artırılması önem taşımaktadır. Verimlilik kısa vadede üretim faktörleri tarafından belirlense de uzun vadede kurumlar tarafından belirlenir. Doğal kaynak bağımlılığının aşılması, teknolojik inovasyon, yeşil dönüşüm ve yerel girişimler desteklenmelidir (UNECA, 2020).

Sosyal Güvenlik ve Beşerî Sermaye, sosyal Güvenlik sistemlerinin etkinliğini artırmak yoksulluğu azaltmanın en etkili yollarından biridir. Bunun yanı sıra Eğitimde fırsat eşitliği ve ücretsiz zorunlu eğitimler, sağlık hizmetlerine kolay ve hızlı erişim beşerî sermayeye yapılan yatırımlar olarak uzun vadede kapsayıcı kalkınmanın sürdürülebilirliğini sağlar (World Bank, 2019).

Toplumsal Cinsiyet ve Gençlerin Ekonomiye Katılımı, kapsayıcı büyümenin önündeki en önemli engel toplumsal cinsiyet ayrımcılığıdır. Kadın girişimciliğinin teşvik edilmesi, pozitif ayrımcılık uygulanması, kapsayıcılığı güçlendirecek mekanizmalar arasında sayılabilir. (ILO, 2022).

Altyapı ve Bölgesel Eşitsizliklerin Azaltılması, bölgeler arası altyapı eşitsizlikleri, ulaşım, enerji, sulama gibi temel altyapı hizmetleri arasında bölgeler arasında farklılıklar olması ekonomik faaliyetleri yavaşlatacağı gibi kent ve kırsal arasındaki kopukluğu da artırabilir. Bunların giderilmesi ve yaratacağı sinerji kapsayıcı büyümenin güvencelerinden olacaktır.

Sonuç ve Politika Önerileri

Afrika'da kapsayıcı büyümenin ve genel olarak ekonomik kalkınmanın ve refahın başarısı büyüme hedeflerinin ekonomik göstergelerin ötesine geçen etik ve normatif temellere kavuşmasıyla mümkün olabilir. Salt büyüme odaklı kalkınma stratejileri, toplumsal eşitsizlikleri artırarak uzun vadede gelişmenin ve kalkınmanın önüne engel oluşturabilir.

Kapsayıcı kalkınma hedeflerinin açık bir şekilde tanımlanması ve bu hedeflerin diğer maddi hedeflerle uyumlaştırılması ve onlara entegre edilmesi gerekmektedir. Fırsat eşitliği, insan hakları, siyasal katılım, yerel yönetim mekanizmalarının güçlendirilmesi, karar alma süreçlerine katılımın sağlanması kapsayıcılığın kurumsallaştırılması açısından önemlidir.

Ekonomik kalkınmanın etik temelleri önemlidir. Ekonomik kararlar teknokratlar tarafından soyut ekonomik veriler temel alınarak değil, toplumsal değerler ve adalet perspektifi ile alınmalıdır.

Sonuç olarak Afrika'da ekonomik kalkınma ancak kurumsal reformlar, demokratik katılım ve ekonominin normatif boyutları birlikteliğiyle mümkün olacaktır. Kıta ancak bu şekilde adil sürdürülebilir bir kalkınma gerçekleştirebilir.

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“Patterns in Economic History”: Economic Triggers in the Post-Covid Era, and The U.S. Yield Curve?

Ayatullahi Seidu¹

Abstract

The yield spread is known to have a good predictive ability of economic activity. In about the Fall of 2023, a Deutsche Bank comparative study revealed that in the U.S., four of the macro triggers that were most commonly associated with recession became imminent. Using monthly data from January 2020 to September 2023, we attempted to study this system of variables relative to the yield curve. Among other things, we found that the counter-cyclical monetary policy model, which states that the yield curve moves in the direction of monetary policy, was relatively more pronounced, which was characteristic of the immediate post-COVID monetary policy path. However, this was short-lived, as the yield spread responded negatively only in the first three months and normalized thereafter. If a “technical recession” is referred to as an overall decline in economic activity for two to three quarters, contrary to the Deutsche Bank research, we subsequently inferred that an imminent recession was less likely.

Keywords: Yield curve, U.S., Recession, Deutsche Bank, Macro Triggers

JEL: C32, E43, G12, N12

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Introduction

For simplicity, the yield curve (YC hereon) is the graphical representation of the term structure of interest rates on assets of different maturities (Avdoulas et al., 2019). Since the wave of the “New Monetary Consensus” (NMC) that swept through the 1970s and 1980s, the YC has become the easy go-to tool for macro-analyzing the behavior of the economic cycle. Among other tools, the YC is largely seen as a highly effective predictor of economic activity. It is used to observe whether the economy is in expansion, transition, and recession. While there is no one way of studying the YC, two approaches stand out; the parsimonious model (Nelson & Siegel, 1987) and the simple empirical model (Estrella, 2005; Hvozdenka, 2015a).

The three main latent components or factors of the YC are known as the level, slope (or spread), and curvature. The spread has, however, featured predominantly because of the value of the information it is assumed to capture. For instance, it is argued that when the economy is in a relatively stable state, the spread normalizes or reverses to the mean; when the economy is in an expansionary state, the spread steepens slopes (upward); and when the economy is in recession, the spread inverts (slopes downward). This third instance is popularly referred to as YC inversion. Historically, the spread has behaved differently in the U.S.; for instance, it was potent for most of the 80s through the 90s, but it failed to predict the recession that followed the 2007-2008 global financial crisis (GFC). Strikingly so, post-COVID, the U.S. spread (e.g., 10Y3M) started inverting since May-June 2022 and has continued to settle broadly in the negative territory, as seen in the figure below, sparking new fears of an impending recession.

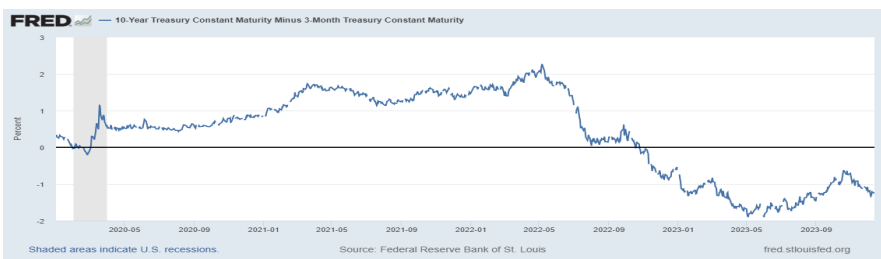


Figure 1. 10-year minus 3-month treasury maturities.

While there are mixed reactions about this impending recession, a recent Deutsche Bank comparative study² revealed that in the U.S., four of the macro triggers that are most commonly associated with recession are currently imminent. Among other things, the researcher stated that “it is impossible to accurately predict every recession using macro triggers but is fair to say that the most significant ones have been breached this cycle and that the U.S. tends to be more sensitive to these historically.” The triggers include, for instance, rising short-term interest rates, surging inflation, yield curve inversion, and oil price shock. We, therefore, attempted to study this system of variables relative to the YC. We, specifically, examined the impulses from the changes in the short-term interest rate (i.e., the effective federal funds rate) and oil prices to other variables in the system, including the yield spread, and explored the directions of causality, if any, among the variables in the system. We found that changes in the short-term interest rate Granger-caused inflation, the yield spread, and the oil price. However, changes in the oil price only Granger-caused inflation. These are all unidirectional causalities. Therefore, based on the Granger causality test, the effect of the changes in the short-term rate was dominant. Again, the counter-cyclical monetary policy model, which states that the YC moves in the direction of monetary policy, was relatively more pronounced, which is characteristic of the post-COVID monetary policy path. However, this was short-lived, as the yield spread responded negatively only in the first three months and normalized thereafter. If a “technical recession” is referred to as an overall decline in economic activity for two to three quarters, in contrast to the Deutsche Bank research, we inferred that an imminent recession was less likely.

In the pure (real) exchange economy model, where money is neutral, developments such as the rational expectations model (EHT; Muth, 1961), the intertemporal consumption asset-pricing model (I-CAPM; Harvey, 1988), and the counter-cyclical monetary policy model (CMPM; Kozicki & Tinsley, 2001; Svensson, 2003; Bernanke et al., 2005) are largely used to explain the behavior of the YC. In the EHT, future expectations can be predicted based on prevailing macroeconomic behavior, and the goal is to achieve market efficiency in the “loanable funds” sense. Using the idea of consumption smoothing, the I-CAPM asserts that people will want to invest today (during periods of economic expansion) to exhaust their savings tomorrow (during periods of recession). The CMPM simply

2 Author could not have access to the original report due to Deutsche Bank’s restriction, but utilized the information obtained from the analysis of other credible secondary sources. See, Yahoo Finance, Business Insider.

posits that the YC moves in the direction of monetary policy. As such, a shock in the short-term nominal interest rate affects all the other interest rates in the market. Arguably, all these models stem from the [strong-form] Fisher identity which asserts that there is a relationship between short-term nominal interest rates and expected inflation (Fisher, 1907), as seen in the following functional form:

$$i_t \equiv r_t + \pi_t^e \quad (1)$$

Where i is the short-term nominal interest rate, r is the short-term real interest rate, and π is the inflation. e means expected and t means time. However, since investors will need to be compensated for the risk of investing long-term due to uncertainty, the Arrow-Pratt coefficient requires adjusting the eqn. 1 to capture the market risk premium. This is given by eqn. 2:

$$i_t = r_t + \pi_t^e + mrp_t \quad (2)$$

Where mrp represents the market risk premium. Putting eqn. 1 and eqn. 2 together, we get the reduced form in eqn. 3:

$$lr_t - sr_t = lr_{tr} + l\pi_t^e + mrp_t - (sr_{tr} - s\pi_t^e) \quad (3)$$

We, however, restate the mrp to further explain its components, where r_m^e represents the expected market return and r_f represents the risk-free rate. This is shown in eqn. 4:

$$lr_t - sr_t = (lr_{tr} - sr_{tr}) + (l\pi_t^e - s\pi_t^e) + (r_m^e - r_f) \quad (4)$$

In the monetary production economy, where money is non-neutral, the [institutionalist] post-Keynesian approach often rejects the “general equilibrium” view of the economy, as found in the real exchange one. Here, the post-Keynesians argue that only the short-term term nominal interest rate in the market is a policy variable. Hence, creating an assumption of inflation expectation merely amounts to speculating against the economy, or betting on the national debt. They argue that there is no such thing as a real interest rate, as it is unobservable, and that the assumption of inflation expectation is used in the real exchange model only to find space for the real interest rate (Tymoigne, 2006; Kregel, 2000). However, some recent developments within the post-Keynesian tradition (Cantillo, 2024) allege that, due to fundamental uncertainty, expectations can be formed without necessarily being [perfectly] predicted. Another popular post-Keynesian critique of the orthodox (neoclassical) model is that in practice, or in reality, investors do not necessarily hold the bonds to maturity. This does not only present a unique policy view; it also does some degree of “violence” to the loanable funds model.

The empirical studies are broadly categorized into three: Those that asserted that the yield spread has predictive ability (Idilbi-Bayaa & Qadan, 2022; Zhu

& Rahman, 2015; Peel & Taylor, 1998; Hännikäinen, 2017; Kiani, 2009; Gogas et al., 2015; Joslin et al., 2014); those that asserted that the yield spread lacked predictive ability (i.e., broken or weaker ability)(Cascaldi-Garcia, 2017; Dewachter et al., 2014); and those that asserted that the yield spread's predictive ability was mixed (Huse, 2011; Evgenidis & Siriopoulos, 2014; Giacomini & Rossi, 2006; Idilbi-Bayaa & Qadan, 2021). Our paper approached the subject differently by contextualizing or limiting it to a specific set of variables, which influenced policy discussions, and a specific period in the U.S., which needed a carefully-thought-out monetary policy response. Again, for, arguably, the first time, we sought to technically evaluate a subject of huge attention in financial policy research.

Section 1 introduced the paper. Section 2 discussed the materials and methods. Section 3 presented and discussed the results. Section 4 concluded the paper, providing the key findings.

Materials and Methods

Data Description

The study required the use of a high-frequency time series, given the sampled period. As such, we employed monthly data, ranging from 2020M01 to 2023M09. While the global economy started showing signs of recovery in 2020, following the ease of COVID-19 lockdowns, the debate that emerged was whether inflation was transitory or persistent. The general market consensus, however, was that neither matters; instead, “what the Fed says is what matters.” Well, the Fed ended up in the transitory camp, raising the question of how transitory it was. What was particularly fascinating being the action of the Fed and what followed. The Fed arguably kept the rates low in support of the economic recovery, but started raising the rates a bit later, responding to several market concerns to “act fast or suffer the consequences.” In light of this, a recent Deutsche Bank report,³ taking into consideration the current aggressive monetary policy environment or the Fed’s policy stance, revealed that four of the macroeconomic triggers commonly associated with U.S. recessions have been breached now, heightening tension about the nature of the post-COVID economic cycle⁴. We, therefore, focused our study period on the post-COVID era, with the upper and lower limits defined by the beginning of the COVID economic recovery and data availability respectively. The

3 See: Yahoo Finance.

4 Also termed, in some respect, as the “the new macro supercycle.”

short-term interest rate was represented by the effective federal funds rate (FF). Inflation was depicted by the total consumer price index (CPI), defined in terms of contribution to annual inflation. The slope of the yield curve, i.e., the yield spread, was proxied by the difference between the 10-year treasury and the 3-month treasury constant maturities (10Y3M) in nominal terms. The oil price (OIL) was also proxied by the global price of Brent Crude in U.S. dollars per barrel. The data were collected from the Federal Reserve Economic Database (FRED). Table 1 below contains the summary statistics.

Time Series	D(FF)	LNCPI	10Y3M	LNOIL
Mean	0.085894	1.185290	0.464898	4.237841
Median	0.017425	1.583520	0.574545	4.317150
Maximum	0.700000	2.193700	1.984000	4.768080
Minimum	-0.930845	-2.970440	-1.734545	3.290220
Std. Dev.	0.270195	1.044268	1.123630	0.356898
Skewness	-0.860214	-1.792822	-0.648072	-0.828272
Kurtosis	7.308964	7.036853	2.191354	2.947872
Jarque-Bera	39.46624	54.66194	4.376060	5.150353
Probability	0.000000	0.000000	0.112137	0.076140
Sum	3.779355	53.33807	20.92041	190.7029
Sum Sq. Dev.	3.139225	47.98183	55.55198	5.604542
Observations	44	45	45	45

Table 1. Time Series Summary Statistics.

Econometric Model

In this sub-section, we detailed the estimation strategy and briefly described the empirical model. The vector autoregressive (VAR) model was preferred for studying the a-theoretical relationships between the variables. The VAR model was proposed by Sims (1980), in his famous paper “Macroeconomics and Reality,” to study the dynamics between [statistically] endogenous variables in an economic system. As such, each variable would be dependent on its past values as

well as other variables within the VAR system. Applicable to a system of equations, estimating the VAR model required setting the series at $I(1)$, which meant the variables must be stationary at the first difference. Most notably, the VAR system uses the ordinary least squares (OLS) estimator to generate the coefficients in the main matrix. Hence, the VAR model helped us to understand the effect of each of the variables on other variables in the system. It was, therefore, assumed that the standard VAR would account for the a-theoretical interrelationships among the macro triggers being studied, giving us the chance to analyze the dynamic based on the network interconnectedness or the shock transmission mechanism of monetary policy. Including the global oil price proxy also helped to capture the effect of an external shock on other variables in the VAR system. Therefore, we estimated a multivariate VAR(p) model of the following reduced form:

$$dff_t = \alpha + \sum_{i=1}^k \beta_i dff_{t-i} + \sum_{j=1}^k \gamma_j lncpi_{t-j} + \sum_{m=1}^k \delta_m 10y3m_{t-m} + \sum_{n=1}^k \varphi_n lnoil_{t-n} + \varepsilon_t \quad (5)$$

$$lncpi_t = \alpha + \sum_{i=1}^k \beta_i dff_{t-i} + \sum_{j=1}^k \gamma_j lncpi_{t-j} + \sum_{m=1}^k \delta_m 10y3m_{t-m} + \sum_{n=1}^k \varphi_n lnoil_{t-n} + u_t \quad (6)$$

$$10y3m_t = \alpha + \sum_{i=1}^k \beta_i dff_{t-i} + \sum_{j=1}^k \gamma_j lncpi_{t-j} + \sum_{m=1}^k \delta_m 10y3m_{t-m} + \sum_{n=1}^k \varphi_n lnoil_{t-n} + v_t \quad (7)$$

$$lnoil_t = \alpha + \sum_{i=1}^k \beta_i dff_{t-i} + \sum_{j=1}^k \gamma_j lncpi_{t-j} + \sum_{m=1}^k \delta_m 10y3m_{t-m} + \sum_{n=1}^k \varphi_n lnoil_{t-n} + \omega_t \quad (11)$$

Where d is the differenced operator, $lnln$ represents the natural logarithm, and all variables are taken as defined above. α is the intercept term; β_i , γ_j , δ_m , and φ_n denote the elasticities; $t - i$, $t - j$, $t - m$, and $t - n$ denote the lag order from i to k selected using the Akaike information criterion (AIC) and Hanan-Quin (HQ) information criterion.

Results and Discussions

Unit Root Test

We used the Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) unit root tests to determine the order of integration of the time series. The results in Table 2 indicated that the time series are integrated in the first order. This meant both tests are unable to reject the null hypothesis of unit root at level [i.e., $I(0)$], leaving us with only $I(1)$ series.⁵ The results for the ADF and PP unit root tests were, respectively, reported in Table 2.

ADF unit root test results					
Time series	ADF at level		ADF at first difference		Decision
	Constant	Linear time trend	Constant	Linear time trend	
10Y	0.239038	-3.878470**	-5.529924***	-5.554696***	I(1)
10Y3M	-0.839434	-1.974323	-4.342232***	-4.680573***	I(1)
10YFF	-1.131876	-1.926111	-4.280554***	-4.610867***	I(1)
3M	-0.986912	-1.779319	-3.660320***	-4.457921***	I(1)
3MFF	-2.087502	-2.813245	-8.492899***	-8.401620***	I(1)
5Y	0.757960	-3.575800**	-4.268171***	-4.497652***	I(1)
5Y3M	-1.221754	-1.718504	-4.529343***	-4.725752***	I(1)
5YFF	-1.380568	-1.656291	-4.455412***	-4.672862***	I(1)
lnFF	-1.049958	-3.725091**	-4.265591***	-4.605510***	I(1)
lnCPI	-6.486188***	-1.410318	-5.813403***	-18.68696***	I(1)
lnOIL	-0.970097	-2.137536	-4.256454***	-4.201087***	I(1)
PP unit root test results					
Time series	PP at level		PP at first difference		Decision
	Constant	Linear time trend	Constant	Linear time trend	
10Y	0.367036	-3.600017**	-3.958765***	-4.122846**	I(1)
10Y3M	-0.507999	-1.391998	-4.342232***	-4.743490***	I(1)
10YFF	-0.691451	-1.277578	-4.373247***	-4.585217***	I(1)

⁵ We used the differenced series of the effective federal funds rate to obtain an efficient output.

3M	0.496469	-2.403428	-3.601180***	-4.651071***	I(1)
3MFF	-1.922571	-2.885913	-8.592725***	-8.504903***	I(1)
5Y	0.462217	-3.526505**	-4.069388***	-4.295223***	I(1)
5Y3M	-0.854508	-1.228876	-4.501741***	-4.682212***	I(1)
5YFF	-0.985208	-1.146658	-4.447639***	-4.621707***	I(1)
lnFF	-0.756636	-3.308097*	-4.199966***	-4.633738***	I(1)
lnCPI	-1.696515	-2.427993	-6.026208***	-6.021396***	I(1)
lnOIL	-1.186473	-2.390656	-4.030803***	-3.907094**	I(1)

Table 2. Augmented Dickey-Fuller (ADF) and Philips Perron (PP) unit root test results.

NB: “*” “**” and “***” indicate the rejection of the null hypothesis at 10%, 5%, and 1% respectively.

The Vector Autoregression Model

To assess the validity of the results, we carried out relevant diagnostics tests-serial correlation test, heteroscedasticity test, stability test, and normality test.⁶ Among other things, the results indicated that the model is significant, with a relatively higher explanatory power of 82% of the series in the model. Based on the lag selection criteria (AIC and HQ), we estimated the model using three lags.

The results showed that the effective federal funds rate (FF) is significant and positively related to the consumer price index (lnCPI) at lag 2. The result of this was that for a one-unit change in the effective federal funds rate (dFF), there is an approximately 102% change in the consumer price index (lnCPI) at lag 2. It was, however, significant and negatively related to the consumer price index (lnCPI) at lag 3, with an approximately 87% change. Similarly, the effective federal funds rate (dFF) was significant, but negatively related to the yield spread (10Y3M) at lag 2, implying that for a one-unit change in effective federal funds rate (dFF), there was an approximately 85% chance of the spread inverting. On the contrary, there was a significant and negative relationship between the consumer price index (lnCPI) and the effective federal funds rate (dFF) at lags 1 and 2. This meant that a one-unit change in the consumer price index (lnCPI) was accompanied by a corresponding 21% and 12% change in the effective federal funds rate (dFF) at lags 1 and 2

6 See appendix

respectively. Again, the spread (10Y3M) was both positively and negatively related to the effective federal funds rate (dFF), and significant at lags 2 and 3 respectively, implying that a one-unit change in the spread (10Y3M) leads to approximately 35% and 23% change in the effective federal funds rate (dFF) at lags 2 and 3 respectively. The oil price (lnOIL) was also significant and positively related to the consumer price index (lnCPI) at lag 1. This meant a one-unit change in the oil price (lnOIL) has an accompanying 275% change in the consumer price index (lnCPI). Figures 2 and 3 below depicted the results of the impulse-response function.

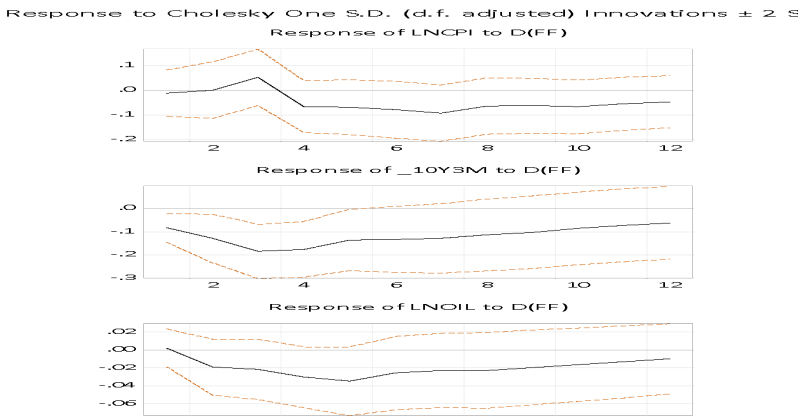


Figure 2. Shock from The Effective Federal Funds Rate.

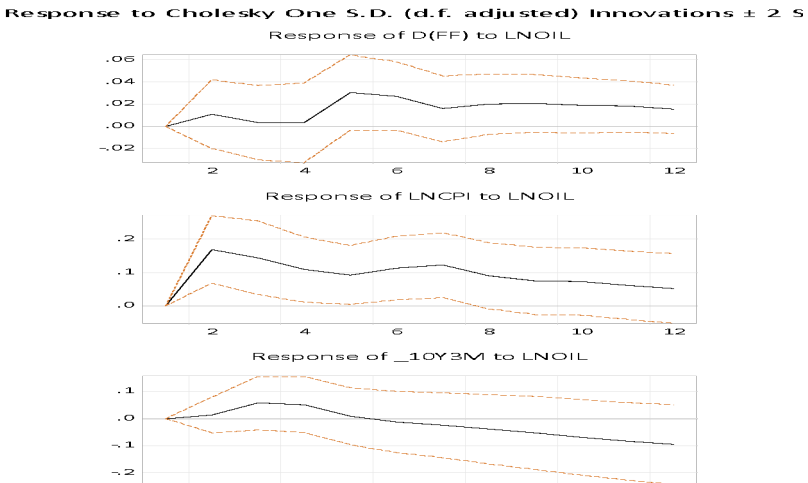


Figure 3. Shock from The Global Oil Price.

Granger Causality Test

We also tested for Granger causality. This test helped to determine whether there was causality between the variables in the VAR system. It also helped to identify the direction(s) of causality, if any.

The results indicated that the effective federal funds rate (dFF) Granger-caused the consumer price index (lnCPI), the yield spread (10Y3M), and the oil price (lnOIL), with an associated unidirectional causality. Similarly, the oil price (lnOIL) Granger-caused the consumer price index (CPI), showing a unidirectional causality.

Conclusion

We found that when there was a shock from the effective federal funds rate (dFF), the consumer price index (lnCPI) rose in the first three months⁷ (first quarter), declined significantly in the next five periods, and then subsequently reversed back to the mean. The spread (10Y3M) significantly declined in the first three months, normalized in the next month, and then steepened in the subsequent months. Similarly, the oil price (lnOIL) fell in the first four months and then reversed back to the mean in the remaining eight months. Meanwhile, we also found that when the shock was coming from the oil price (lnOIL), the consumer price index (CPI) picked up immediately, and then largely declined from the second month onwards. However, the spread (10Y3M) picked up in the first three months but inverted for the remaining months of the year. The response of the effective federal funds rate (dFF) to a shock in the oil price (lnOIL) was mixed (rise, fall, steady) even though it broadly stayed within the positive territory. Again, after the Granger causality test, we discovered that the effective federal funds rate (dFF) Granger-caused the consumer price index (lnCPI), the spread (10Y3M), and the oil price (lnOIL). Similarly, the oil price (lnOIL) Granger-caused the consumer price index (lnCPI).

7 The rule of thumb requires setting the period of adjustment in months since the data are in monthly frequency.

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Sustainable Leadership Competency Model (SLCM) For Emerging Markets and Developing Economies: Integrating Global Frameworks with Regional Realities

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Abstract

Effective leadership is critical for navigating the complex sustainability challenges unique to Emerging Markets and Developing Economies (EMDEs). While global leadership models provide a foundation, they lack contextual applicability for the distinct volatilities and socio-cultural realities of EMDEs, creating a significant gap in both theory and practice. This study aimed to develop and validate a culturally attuned Sustainable Leadership Competency Model (SLCM) specifically for these contexts. The research employed a sequential mixed-methods methodology, beginning with a systematic review of global literature to extract competencies, followed by structured interviews with 13 regional experts for validation and refinement. The resulting validated model identifies five core domains: Strategic Competencies, Core Competencies, Core Values, Collaborative Competencies, and Personal Leadership Capacities comprising 16 specific competencies, including critical refinements such as Frugal Innovation, Critical Reflexivity, and Authentic Humility. This study provides policymakers, educators, and organizational leaders in EMDEs with a practical, evidence-informed framework to cultivate leaders capable of driving inclusive and resilient growth. Future research should focus on developing a quantitative instrument to test the model's predictive validity across diverse EMDE settings.

Keywords: Sustainable leadership, competency model, emerging markets, EMDEs, SDGs

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Introduction

Leadership is widely recognized as a critical determinant of organizational performance, societal transformation, and sustainable development, particularly in the context of Emerging Markets and Developing Economies (EMDEs) where institutional, economic, and environmental vulnerabilities converge (Kouzes & Posner, 1998; Brown & Harvey, 2011). As global challenges intensify, ranging from climate change, resource scarcity, and biodiversity loss to socio-economic inequalities and institutional fragility, the need for leaders capable of navigating complexity, uncertainty, and paradoxical tensions has become increasingly urgent (Garbie, 2014; Kantabutra, 2022; Ferdig, 2007). In this respect, the United Nations Sustainable Development Goals (SDGs) offer a universal blueprint for action, emphasizing inclusive, equitable, and environmentally sustainable growth (United Nations, 2015). However, the effective realization of these goals is contingent upon leaders who are not only technically competent but also possess the capacity to integrate systemic thinking, ethical stewardship, and culturally attuned strategies into their decision-making (Senge et al., 2015; Van Norren & Beehner, 2021).

The imperative of sustainable leadership is particularly pronounced in EMDEs, where socio-cultural diversity, institutional constraints, and economic volatility present unique challenges that are often under-addressed by mainstream, Western-centric leadership models (Voak et al., 2024; Ruwanika & Massyn, 2024). Traditional leadership frameworks, designed for relatively stable, resource-rich contexts, frequently fail to equip leaders in EMDEs with the skills, knowledge, and values necessary to drive sustainable outcomes (Gitsham et al., 2008; Strandberg, 2015). For instance, in the manufacturing sector of developing countries such as Zimbabwe, conventional Leadership Competence Frameworks (LCFs) were found to be overly broad and insufficiently focused on sustainability imperatives, resulting in significant gaps between leader preparedness and the competencies required to advance the SDGs (Ruwanika & Massyn, 2024). Similarly, in the ASEAN Halal supply chain sector, leaders often rely on Western definitions of effective leadership that neglect the ethical, cultural, and religious nuances of the local context, leading to inefficiencies, reduced trust, and talent retention challenges (Voak et al., 2024; Abdullah & Azam, 2020). In the Indian private healthcare sector, the absence of context-specific leadership models has similarly revealed substantial competency gaps, particularly in areas such as talent development, accountability, and human resources management, which are critical for ensuring patient safety and organizational resilience (Pandit, 2016; McAlearney, 2008,

2010). Collectively, these studies illustrate that the survival, effectiveness, and sustainability of organizations in EMDEs are contingent on contextually relevant leadership development, rather than a simple transplantation of Western models.

The limitations of existing leadership models are further compounded by a global overemphasis on technical or operational competencies, often at the expense of relational, ethical, and meta-competencies required to navigate multi-stakeholder and cross-cultural environments (Voak et al., 2024; Branine & Pollard, 2010). In the context of sustainability, leaders are increasingly expected to exhibit systemic thinking, anticipatory capacities, reflexivity, and ethical stewardship, as outlined in UNESCO's eight key competencies for sustainable leadership (Van Norren & Beehner, 2021; Nakashima, 2010). However, the current literature reveals a significant disconnect between these global competency frameworks and the leadership practices prevalent in EMDEs, where hierarchical, individualistic, and transactional leadership styles often dominate (Van Norren, 2020; Beehner, 2020b). Indigenous and region-specific leadership philosophies –such as Ubuntu in Africa, Buen Vivir in South America, and Bodhisattva leadership in Asia– offer complementary principles emphasizing collective agency, reciprocity, long-term stewardship, and ethical relationality, yet they remain underrepresented in formal sustainability leadership models (Van Norren, 2020; Van Norren & Beehner, 2021; Bouckaert & Zsolnai, 2012). This gap highlights the necessity for hybrid leadership frameworks that integrate global sustainability competencies with culturally grounded, context-specific leadership practices to create resilient and socially inclusive outcomes.

The inadequacy of existing leadership models in EMDEs manifests as both a practical and strategic problem. Leaders frequently report feeling unprepared to address sustainability challenges, which has serious implications for organizational performance, societal wellbeing, and the attainment of the SDGs (Strandberg, 2015; Ruwanika & Massyn, 2024). In the manufacturing sector, leaders struggle with operationalizing sustainability in complex production systems, while in the Halal supply chain sector, cross-cultural misunderstandings and misaligned ethical frameworks impede effective collaboration and trust (Voak et al., 2024; Hidayat, Rafiki, & Nasution, 2022). In healthcare, ineffective leadership can have life-and-death consequences, underscoring the critical need for leaders who combine technical acumen with ethical, relational, and strategic capacities (Pandit, 2016; Malagón-Londoño, Galán, & Pontón, 1996). These challenges underscore a pressing need for empirically grounded, context-specific leadership competency

models that equip leaders in EMDEs to navigate volatility, uncertainty, complexity, and ambiguity (VUCA) while advancing sustainability goals.

From a research perspective, the literature on sustainability leadership in EMDEs is nascent and fragmented, revealing multiple interrelated gaps. First, there is a lack of context-specific, sector-sensitive competency models that align with global sustainability objectives while addressing local cultural and institutional realities (Pandit, 2016; Ruwanika & Massyn, 2024; Voak et al., 2024). Second, indigenous knowledge and non-Western leadership philosophies are underrepresented in formal frameworks, limiting the relevance and effectiveness of leadership interventions in EMDE contexts (Van Norren & Beehner, 2021; Nakashima, 2010). Third, existing frameworks often overemphasize technical competencies and underemphasize meta-competencies such as resilience, reflexivity, ethical stewardship, and collaborative capacity, which are critical for managing multi-level sustainability challenges (Beehner, 2020b; Ferdig, 2007). Finally, many proposed models lack rigorous empirical validation, making their practical applicability uncertain and hindering their adoption in organizations operating in high-stakes, resource-constrained, and culturally diverse contexts (Ruwanika & Massyn, 2024; Van Norren, 2020).

Addressing these gaps, the present study proposes a Sustainable Leadership Competency Model (SLCM) for EMDEs, designed to integrate global sustainability competencies with region-specific cultural, ethical, and operational realities. Building on UNESCO's eight key competencies, contemporary integrative models of sustainability leadership, and sector-specific frameworks such as the Bicycle Metaphor for developing countries (Ruwanika & Massyn, 2024), the model adopts a three-phase methodology: (i) a comprehensive literature review synthesizing metatheories, sustainability leadership frameworks, and global and regional leadership concepts; (ii) adaptation of global models through the incorporation of culturally rooted leadership philosophies alongside systems thinking, anticipatory, normative, and reflexive capacities; and (iii) structured expert validation to ensure cultural, operational, and contextual relevance.

The remainder of this article is structured as follows. Section 2 presents the literature review and theoretical background, synthesizing global and indigenous leadership models and highlighting their relevance to EMDEs. Section 3 outlines the research methodology, detailing the three-phase process of developing and validating the SLCM. Section 4 presents the findings and discussion, including the final SLCM and its applications across sectors and levels of leadership. Section

5 concludes the article, summarizing the study's contributions, implications for practice and policy, limitations, and directions for future research. Through this structured approach, the study bridges the gap between global sustainability aspirations and the localized leadership realities of EMDEs, contributing to both theory and practice in sustainable leadership development.

Literature Review

Theoretical Background: Resource-Based View (RBV)

The Resource-Based View (RBV) is one of the most influential frameworks in strategic management, emphasizing that organizations achieve sustained competitive advantage by leveraging resources that are valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 1991, as cited in Liao, 2022). When applied to leadership, RBV provides a powerful lens for understanding how sustainable leadership competencies function as intangible resources that shape long-term organizational resilience and performance.

Sustainable leadership is inherently about balancing economic, social, and environmental goals while navigating complexity and paradox (Ferdig, 2007; Sajjad et al., 2024). From an RBV perspective, the competencies required for this –such as systems thinking, ethical values, stakeholder engagement, and adaptive capacity– represent strategic assets. These capabilities are valuable in addressing grand challenges, rare in their integration of holistic and ethical perspectives, difficult to imitate because they are rooted in individual and cultural values, and non-substitutable given their unique role in fostering sustainable outcomes (Peterlin et al., 2015).

Avery and Bergsteiner (2011a, 2011b) strengthen this argument by conceptualizing sustainable leadership as a structured set of practices designed to balance people, profit, and planet over the life of the firm. When embedded as leadership competencies, these practices align with RBV's criteria for sustained advantage. Similarly, Rainey (2013) emphasizes that sustainable leadership entails diverse philosophies and methods that cannot easily be replicated by competitors, further reinforcing their role as VRIN resources.

RBV also highlights the dynamic and adaptive nature of strategic resources. Sustainable leadership, as described by Sajjad et al. (2024), is not static but a continuous process of innovation and reflexivity. Leaders manage tensions between competing sustainability goals by leveraging unique cognitive and socio-cognitive processes. This adaptability reflects RBV's premise that resources must evolve to remain sources of competitive advantage in changing environments.

Importantly, RBV reframes leadership not as a generic capability but as a context-specific set of competencies that align with organizational strategy and values. Liao (2022) argues that sustainable leadership operates across individual, organizational, and systemic levels, enabling leaders to integrate ethical, economic, and environmental concerns. These competencies extend beyond technical expertise and embody intangible qualities that position leadership as a cornerstone of sustained organizational success.

In sum, RBV provides a robust theoretical foundation for examining sustainable leadership competencies as critical intangible resources. By meeting the VRIN criteria, these competencies serve as the backbone of long-term organizational and societal value creation, underscoring that sustainable leadership is not just a style but a strategic asset central to enduring advantage (Sajjad et al., 2024; Ferdig, 2007; Avery & Bergsteiner, 2011a).

What is the Leadership?

Leadership has been a central focus of organizational research for decades, yet no single, universally accepted definition exists. Instead, the concept of leadership is best understood as a dynamic and multifaceted social process. Liden, Wang, and Wang (2025) synthesize decades of leadership literature and emphasize that leadership is fundamentally a social influence process in which leaders attempt to motivate and enable followers to contribute toward achieving collective goals (Bass, 1990; Yukl, 2002). This perspective highlights the relational and goal-directed nature of leadership, distinguishing it from mere managerial authority. While management focuses on planning, organizing, leading, and controlling resources, leadership is characterized by vision, dynamism, and the ability to inspire others toward a shared purpose (Kotter, 1990; Liden et al., 2025).

Leadership is not merely tied to formal roles or titles; rather, it is action oriented. Individuals can enact leadership through behaviors that inspire, encourage, or engage others, irrespective of their formal position (Forbes, 2017; Liden et al., 2025). This perspective aligns with relational theories of leadership, such as the Leader-Member Exchange (LMX) theory, which posits that leadership effectiveness arises from unique, dyadic relationships between leaders and followers, rather than an average leadership style applied uniformly (Graen, Dansereau, & Minami, 1972). Furthermore, the legitimacy and success of leadership depend on followership, underscoring the reciprocal nature of the leader-follower relationship (Baker, 2007; Bastardo & Van Vugt, 2019).

Carton (2022) complements this relational view by distinguishing between the study of leaders (the person) and leading (the process). According to Carton, the essence of leadership lies in the process of influence, wherein an individual attempts to motivate others toward a common purpose. Leading involves three core mechanisms: directing effort toward a shared objective, initiating effort through goal setting, and maintaining effort via feedback and subgoals (Latham & Pinder, 2005). Importantly, this process is independent of formal authority, meaning that anyone can exercise leadership by effectively influencing others toward collective goals (Carton, 2022).

By integrating these perspectives, a comprehensive academic definition of leadership emerges:

Leadership is a dynamic, social influence process, grounded in relationships, whereby an individual (formal or informal) motivates and enables followers to contribute to the achievement of collective goals. Leadership is action-oriented, distinct from managerial authority, and contingent on the recognition and acceptance of followers.

This definition captures several critical dimensions of leadership:

- **Process and Influence:** Leadership is an active process of influencing others, rather than a static attribute or title.
- **Relational Nature:** Leadership is fundamentally rooted in the interactions and relationships between leaders and followers.
- **Goal-Oriented:** Leadership is directed toward achieving shared objectives that are meaningful to both leaders and followers.
- **Follower-Dependent:** The effectiveness of leadership is contingent upon followership; without followers, leadership cannot exist.
- **Non-Position-Dependent:** Leadership can be exercised by anyone, regardless of formal authority or hierarchical status.

This foundational understanding sets the stage for exploring sustainable leadership competencies, particularly within the complex contexts of Emerging Markets and Developing Economies (EMDEs). It underscores that effective leadership is not only about positional power but also about relational influence, ethical engagement, and goal alignment-principles that are essential for addressing the sustainability challenges that characterize EMDE contexts (Van Norren & Beehner, 2021; Ruwanika & Massyn, 2024; Voak, Fairman, & Helmy, 2024).

Sustainable Leadership

The concept of sustainable leadership has emerged over the past three decades as scholars and practitioners have sought to redefine leadership in response to complex global challenges such as climate change, resource scarcity, social inequality, and disruptive technological transformations. Unlike traditional leadership models that often prioritize short-term gains and efficiency, sustainable leadership emphasizes long-term viability, systemic integration, ethical responsibility, and the simultaneous pursuit of economic, social, and environmental goals. Its development can be traced through several key stages, beginning with foundational work in education and sustainable development and later expanding into organizational, business, and societal contexts.

Early Foundations of Sustainable Leadership

The intellectual roots of sustainable leadership can be linked to the concept of sustainable development, articulated in the Brundtland Commission Report (World Commission on Environment and Development, 1987), which defined sustainability as meeting “the needs of the present without compromising the ability of future generations to meet their own needs.” This report provided a foundation for later applications of sustainability in organizational and leadership contexts, emphasizing the balance between present and future priorities.

Building on this foundation, Hargreaves and Fink (2003, 2004) were among the first to articulate the idea of sustainable leadership in the educational domain. They described it as a holistic and ethical approach that ensures leadership practices are meaningful, enduring, and beneficial for the broader community. Their definition stressed that “sustainable leadership matters, spreads and lasts. It is a shared responsibility, that does not unduly deplete human or financial resources, and that cares for and avoids exerting negative damage on the surrounding educational and community environment” (Hargreaves & Fink, 2003, p. 3). They further elaborated seven principles of sustainable leadership, including depth (fostering meaningful learning), sustainability (ensuring long-term success through succession planning), breadth (shared leadership and dialogue), justice (equitable distribution of resources), diversity (promotion of variety and adaptability), resourcefulness (attracting and developing talent), and conservation (drawing lessons from past experiences to create a better future) (Hargreaves & Fink, 2004).

This early framing positioned sustainable leadership as a corrective to leadership practices that were short-lived, resource-extractive, or narrowly focused on performance metrics. By embedding principles of justice, continuity,

and inclusivity, Hargreaves and Fink set the stage for subsequent applications in business and management.

Expansion into Business and Organizational Contexts

The notion of sustainable leadership entered the field of management through the work of Avery (2005), who emphasized the need for leadership that supported long-term decision-making, systematic innovation, and high-quality outcomes. Avery argued that leaders must balance the “triple bottom line” of people, profit, and planet through practices rooted in ethical behavior, corporate social responsibility, and environmental stewardship. This perspective represented an important shift, as it placed sustainability at the heart of strategic leadership and business success rather than treating it as an external constraint.

Further development came from Avery and Bergsteiner (2011a, 2011b), who articulated the honeybee–locust model of sustainable leadership. In this model, honeybee organizations represent long-term, stakeholder-oriented, and sustainability-driven leadership practices, while locust organizations exemplify short-term, exploitative approaches that exhaust resources and harm ecosystems. Their model identified 23 practices of sustainable leadership, structured in a pyramid model, with basic practices such as stakeholder responsibility and long-term perspective forming the foundation, and high-level practices such as self-management, knowledge sharing, and performance drivers like innovation and quality at the top (Avery & Bergsteiner, 2011a). The ultimate goal of these practices was to create resilient organizations capable of sustaining customer satisfaction, reputation, and long-term value creation (Avery & Bergsteiner, 2011b).

In parallel, Ferdig (2007) provided a seminal definition that significantly influenced later scholarship. He described sustainable leadership as “a holistic approach to co-creating a sustainable future that balances among and between simultaneous and sometimes contradictory demands for economically, socially, and environmentally sustainable solutions” (as cited in Sajjad et al., 2024, p. 25). Ferdig’s contribution was notable for expanding the boundaries of leadership beyond formal authority, arguing that “anyone who takes responsibility for understanding and acting on sustainability challenges qualifies as a sustainability leader” (Ferdig, 2007, p. 25). This definition emphasized inclusivity, collaboration, systems thinking, and ethical responsibility, positioning leadership as a collective and adaptive process rather than an individual role. Ferdig also highlighted the role of complexity science, suggesting that sustainable leadership thrives in contexts of uncertainty, paradox, and dynamic adaptation.

Rainey (2013) further enriched the concept by framing sustainable leadership as a “rich mosaic of principles, philosophies, perspectives, styles, mindsets, experiences, methods, and constructs” (as cited in Sajjad et al., 2024, p. xix). This metaphor reflected the multi-dimensionality and integrative nature of the construct, suggesting that no single leadership model or practice could fully capture its scope. Similarly, Peterlin, Pearse, and Dimovski (2015) emphasized the importance of considering “a wide range of complex interrelations among individuals, the business community, global markets, and the ecosystem” (as cited in Sajjad et al., 2024, p. 280). Their perspective underscored the interconnectedness of sustainability challenges and the need for leaders to balance welfare, social values, long-term organizational success, and environmental stewardship.

Contemporary Integrations and Multilevel Perspectives

More recent scholarship has sought to integrate these diverse perspectives into coherent frameworks. Tideman, Arts, and Zandee (2013) described sustainable leadership as behavior that emerges from leaders’ awareness of disruptive changes in business and society, emphasizing the interaction between leadership consciousness and contextual dynamics in driving transformation. Their approach recognized the role of leadership awareness in responding to rapidly evolving environmental and societal challenges.

Similarly, Gerard, McMillan, and D’Annunzio-Green (2017) conceptualized sustainable leadership as a multidimensional construct that integrates individual, organizational, and systemic factors. Their work suggested that sustainable leadership cannot be understood at a single level but must be analyzed across contexts and stakeholder domains.

A major step toward synthesis came from the integrative reviews by Liao (2022) and Sajjad, Eweje, and Raziq (2024). Liao (2022) defined sustainable leadership as “a leadership approach that balances economic, social, and environmental goals through long-term vision, ethical practices, stakeholder engagement, and systemic innovation” (p. 1045570). Liao highlighted the construct’s cross-level functioning –operating at the individual, organizational, and systemic levels–while stressing characteristics such as ethical grounding, inclusivity, innovation, and adaptability.

Building further, Sajjad et al. (2024) offered a comprehensive synthesis, describing sustainable leadership as “a dynamic and complex process in which sustainability-oriented leaders engage in intricate psycho-cognitive and socio-cognitive

processes to foster sustainable outcomes for business and society in both the short and long run” (p. 2850). They emphasized its paradoxical nature, as leaders must manage tensions between economic, social, and environmental objectives without defaulting to trade-offs. Instead, sustainable leadership seeks holistic integration, reflexivity, resilience, and long-term orientation. This definition underscored that sustainable leadership is not a static attribute but an ongoing process of balancing tensions, innovating strategies, and addressing societal grand challenges.

Synthesized Definition for the Present Study

Drawing on this body of work, sustainable leadership can be understood as an evolving leadership paradigm that integrates ethics, systems thinking, long-term orientation, and inclusivity. From its early conceptualizations in education (Hargreaves & Fink, 2003, 2004) to its expansion into management and organizational research (Avery, 2005; Avery & Bergsteiner, 2011a, 2011b; Ferdig, 2007), and to its most recent synthesized frameworks (Liao, 2022; Sajjad et al., 2024), the construct has consistently highlighted the imperative for leaders to balance the triple bottom line while cultivating resilience and adaptability in complex environments.

For the purposes of this study, sustainable leadership has been defined as:

A dynamic, systemic, and ethically grounded approach to leadership in which leaders, formal and informal, co-create long-term economic, social, and environmental value by managing paradoxes, engaging stakeholders inclusively, and fostering resilience across micro, meso, and macro contexts. Sustainable leadership is not only about maintaining performance but also about regenerating resources, empowering communities, and enabling organizations in emerging and developing economies to thrive under conditions of uncertainty and disruption.

This definition builds on prior scholarship while extending the conversation to the specific challenges of emerging and developing economies (EMDEs), where contextual constraints, institutional voids, and pressing societal needs demand leadership that is both adaptive and transformative.

Research Methodology

This study employed a three-phase methodology to develop and validate a competency model for sustainable leadership within emerging markets and developing economies (EMDEs). The methodology combined a systematic literature review, categorization of competencies based on global competency models, and expert validation.

Phase 1: Systematic Literature Review

The first phase involved a systematic literature review (SLR) to identify competencies associated with sustainable leadership, particularly in contexts relevant to EMDEs. The review followed the PRISMA framework, which comprises four stages: Identification, Screening, Eligibility, and Inclusion.

- **Identification:** The initial database search was conducted in Scopus, Web of Science, and Google Scholar for peer-reviewed articles published between 2000 and 2025. Search terms included combinations of “sustainable leadership competencies,” “sustainable development,” “developing economies,” and “emerging markets.” This process yielded 153 articles.

- **Screening:** After removing duplicates, non-English texts, and irrelevant publications, 68 articles remained.

- **Eligibility:** These articles were assessed in depth for relevance to leadership competencies in sustainability contexts, resulting in 37 articles.

- **Inclusion:** Finally, 22 high-quality, directly relevant articles were selected for full review.

The outcomes of this process are illustrated in Figure 1 (PRISMA Flow Diagram).

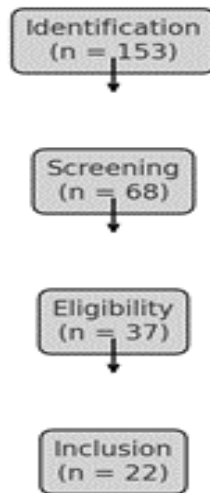


Figure 1. PRISMA Flow Diagram.

Phase 2: Categorization Based on Global Competency Models

In the second phase, the competencies extracted from the 22 selected articles were categorized using existing global competency models for sustainable leadership. This step ensured that the identified competencies aligned with established theoretical frameworks while allowing for contextual relevance to EMDEs.

Phase 3: Expert Validation

The third phase consisted of structured interviews with 13 regional leadership and sustainability experts, including 2 CEOs from the FMCG and energy sectors and 11 scholars specializing in management and sustainable development. Experts were identified through a snowball sampling method, and interviews continued until theoretical saturation was reached. During this phase, the categorized competencies were validated, refined, and adjusted to ensure cultural, contextual, and operational applicability.

Finding

Competency Identification and Categorization

The development of the initial competency framework was conducted through a systematic review of 19 seminal articles on sustainable leadership. Our process involved a meticulous, multi-stage analysis. First, we conducted a full-text thematic analysis of each article, carefully extracting every mentioned leadership trait, skill, behavior, and value. This yielded a long list of over 30 distinct competencies. To synthesize these findings, we employed additive-inductive coding approach. We used the five overarching categories from the foundational SLCM model (Strategic, Core, Values, Collaborative, Personal) as our initial deductive framework. We then inductively sorted the extracted competencies into these categories based on their thematic similarity and functional purpose. For example, traits like “holistic thinking” and “anticipatory thinking” were grouped under Strategic Competencies as they relate to navigating complexity, while values like “ethical conduct” and “stewardship” were clustered into Core Values as they form the leader’s moral foundation (Table 1).

Competency Category & Specific Competency	Frequency	Mentioned By (Author, Year)
i. Strategic Competencies		
Systems Thinking	10	Muff et al. (2020), Van Norren & Beehner (2021), Suriyankietkaew et al. (2022), Visser & Courtice, Asik & Esen, Juhro et al. (2020), O'Dwyer & Ryan (2010), BSR (Gitman & Goldenberg, 2014), Ruwanika & Massyn (2024), Sajjad et al. (2024)
Stakeholder Engagement	7	Muff et al. (2020), Ahmad et al. (2023), Visser & Courtice, Asik & Esen, Yanduri & Siddayya (2024), BSR (Gitman & Goldenberg, 2014), Ruwanika & Massyn (2024)
Adaptability	5	Visser & Courtice, O'Dwyer & Ryan (2010), BSR (Gitman & Goldenberg, 2014), Ruwanika & Massyn (2024), Sajjad et al. (2024)
Reflexivity	4	Muff et al. (2020) (as critical thinking), Van Norren & Beehner (2021), Ruwanika & Massyn (2024), Sajjad et al. (2024)
Sustainability Literacy / SDG Literacy	3	Van Norren & Beehner (2021), Ruwanika & Massyn (2024), Ahmad et al. (2023) (implied)
ii. Core Competencies		
Social Innovation	5	Muff et al. (2020) (Change & Innovation), Visser & Courtice (Creative style), Suriyankietkaew et al. (2022), Juhro et al. (2020) (Breakthrough), Ruwanika & Massyn (2024)
Inclusive Decision-Making	4	Muff et al. (2020) (Stakeholder Relations), Visser & Courtice (Inclusive style), Lotz-Sisitka et al. (2015), Ruwanika & Massyn (2024)
Ecosystem Thinking	2	Ruwanika & Massyn (2024), Van Norren & Beehner (2021) (implied via biocentrism)
iii. Core Values		

Ethical Conduct	12	Muff et al. (2020), McCann & Holt (2010), Suriyankietkaew et al. (2022), Visser & Courtice, Pandit (2016), O'Dwyer & Ryan (2010), BSR (Gitman & Goldenberg, 2014), Ruwanika & Massyn (2024), Sajjad et al. (2024), Iqbal et al. (2020) (implied), Liao (2022) (implied)
Stewardship	5	Muff et al. (2020) (Ethics & Values), Visser & Courtice (Altruistic style), O'Dwyer & Ryan (2010), BSR (Gitman & Goldenberg, 2014), Sajjad et al. (2024)
Equity & Respect for All	4	Van Norren & Beehner (2021) (Normative), Lotz-Sisitka et al. (2015), Ruwanika & Massyn (2024), Sajjad et al. (2024) (implied)
iv. Collaborative Competencies		
Cross-Sector Partnering / Consensus Building	9	Muff et al. (2020) (Collaboration), Van Norren & Beehner (2021), Visser & Courtice, Asik & Esen, Juhro et al. (2020) (Catalytic Collab.), Yanduri & Sidayya (2024), BSR (Gitman & Goldenberg, 2014), Ruwanika & Massyn (2024), Sajjad et al. (2024)
v. Personal Leadership Capacities		
Self-Awareness	10	Muff et al. (2020), Van Norren & Beehner (2021), Suriyankietkaew et al. (2022), Visser & Courtice, O'Dwyer & Ryan (2010), BSR (Gitman & Goldenberg, 2014), Ruwanika & Massyn (2024), Sajjad et al. (2024), Liao (2022) (antecedent)
Resilience	6	Visser & Courtice, O'Dwyer & Ryan (2010), BSR (Gitman & Goldenberg, 2014), Ruwanika & Massyn (2024), Sajjad et al. (2024), Nisha et al. (2022) (implied)
Authenticity	3	Visser & Courtice (Authenticity implied in "Being"), O'Dwyer & Ryan (2010) (Intrapersonal), BSR (Gitman & Goldenberg, 2014) (Leading Self)

Table 1. Competency Identification and Categorization.

The definitions for each category and competency were not invented but were synthesized directly from the language and descriptions used across the literature. For instance, the definition of "Systems Thinking" was distilled from its repeated characterization as "the ability to understand complex interconnections," a phrase found in the works of Visser & Courtice, Sajjad et al., and Asik & Esen. This

rigorous process ensured our initial model was a comprehensive and faithful representation of the existing global scholarship, providing a robust foundation for subsequent contextual validation through expert interviews (Table 2).

Competency Category	Definition & Purpose	Specific Competencies	Definition of Specific Competency	Key References
Strategic Competencies	Abilities to analyze, plan, and guide an organization through complex sustainability challenges with a long-term, adaptive perspective.	Systems Thinking	The ability to understand and analyze complex, interrelated social, ecological, and economic systems, recognizing interdependencies and feedback loops.	Wiek et al. (2011) via Asik & Esen; Visser & Courtice; Sajjad et al. (2024); Van Norren & Beehner (2021)
		Stakeholder Engagement	The ability to identify, communicate with, and incorporate the perspectives of diverse internal and external groups affected by or affecting the organization's actions.	Muff et al. (2020); Ahmad et al. (2023); BSR (Gitman & Goldenberg, 2014)
		Adaptability	The capacity to adjust strategies and operations in response to changing sustainability challenges, market conditions, and new information.	Visser & Courtice; O'Dwyer & Ryan (2010); Sajjad et al. (2024)
		Reflexivity	The practice of critical self-analysis regarding one's own values, assumptions, and impact, and the ability to question dominant norms.	Van Norren & Beehner (2021); Sajjad et al. (2024); Ruwanika & Massyn (2024)
		Anticipatory Competency (Foresight)	The ability to anticipate and envision future trends, uncertainties, and sustainability scenarios to inform proactive decision-making.	Wiek et al. (2011) via Asik & Esen; Van Norren & Beehner (2021); Suriyankietkaew et al. (2022)

Core Competencies	Abilities to integrate sustainability principles directly into the core value creation and innovation processes of the organization.	Social Innovation	The capacity to develop and implement novel solutions to social, economic, and environmental challenges that are both sustainable and scalable.	Muff et al. (2020) - "Change & Innovation"; Juhro et al. (2020) - "Breakthrough"; Visser & Courtice - "Creative" style
		Inclusive Decision-Making	The practice of ensuring diverse voices and perspectives are heard and considered in the process of reaching decisions that affect the community and stakeholders.	Muff et al. (2020) - "Stakeholder Relation"; Visser & Courtice - "Inclusive" style; Lotz-Sisitka et al. (2015)
		Ecosystem Thinking	Understanding the organization as part of a broader ecological and social system, emphasizing health, resilience, and interdependence over extraction.	Ruwanika & Massyn (2024); Van Norren & Beehner (2021) - via "Biocentrism"
Core Values	The fundamental principles and ethical foundations that guide a leader's motivation, judgment, and behavior towards sustainable outcomes.	Ethical Conduct	A steadfast commitment to acting with integrity, honesty, and moral principle in all decisions, prioritizing doing what is right over what is easy.	McCann & Holt (2010); Muff et al. (2020) - "Ethics & Values"; Sajjad et al. (2024)
		Stewardship	The attitude and practice of responsibly managing the resources, well-being, and long-term health of the organization, society, and the environment for future generations.	Visser & Courtice - "Altruistic" style; O'Dwyer & Ryan (2010); Sajjad et al. (2024)
		Equity & Respect for All	A deep-seated belief in and commitment to fairness, justice, dignity, and the inherent value of all people and living things.	Van Norren & Beehner (2021) - "Normative Competency"; Lotz-Sisitka et al. (2015); Ruwanika & Massyn (2024)

Collaborative Competencies	Abilities to build trust, facilitate dialogue, and work effectively across traditional boundaries to achieve common sustainability goals.	Cross-Sector Partnering	The skill to build and maintain strategic alliances and partnerships with organizations from different sectors (business, government, civil society) to address systemic challenges.	Juhro et al. (2020) -“Catalytic Collaboration”; Visser & Courtice; Yanduri & Siddayya (2024) – “Collaborative”
		Consensus Building	The ability to facilitate dialogue among diverse and conflicting parties to find common ground and develop mutually acceptable solutions.	Muff et al. (2020); BSR (Gitman & Goldenberg, 2014); Van Norren & Beehner (2021)
Personal Leadership Capacities	The internal attributes, emotional skills, and self-knowledge that enable a leader to act effectively and authentically in demanding sustainability roles.	Self-Awareness	A deep understanding of one’s own values, strengths, weaknesses, biases, and emotional drivers, and how they impact others.	Muff et al. (2020); Visser & Courtice; Sajjad et al. (2024)
		Resilience	The capacity to persevere, adapt, and recover from setbacks, crises, and the inherent tensions of pursuing sustainability.	Visser & Courtice; O’Dwyer & Ryan (2010); Sajjad et al. (2024)
		Authenticity	The practice of aligning one’s actions with deeply held values and beliefs, leading with transparency, consistency, and genuineness.	Visser & Courtice (implied in “Being”); O’Dwyer & Ryan (2010) - “Intrapersonal Competency”

Table 2. Competency Definition.

Expert Validation

The validation phase consisted of structured interviews with 13 regional experts, who unanimously affirmed the model’s core categories while providing critical, context-driven refinements to enhance its practicality for emerging markets. For instance, when asked about the relevance of ‘Social Innovation,’ a CEO from the energy sector noted, “The term is right, but the reality here is we aren’t just innovating; we are improvising with extreme constraints. We called it ‘Jugaad’ innovation for years-it’s about creating robust solutions with minimal capital.” This insight led to refining the competency into the more precise ‘Frugal Innovation.’ Similarly, scholars emphasized the need for a more power - aware definition of reflection. One professor stated, “It’s not enough to be reflexive about one’s actions; a leader here must be critically aware of their power and privilege. The question isn’t just ‘what did I do?’ but ‘whose voice am I not hearing, and what unintended harm could my decision cause?’” This pushed the evolution of ‘Reflexivity’ into ‘Critical Reflexivity.’ Furthermore, the value of ‘Authenticity’ was challenged by an FMCG CEO who argued, “An ‘authentic’ arrogant leader is still arrogant. What we need is confident humility - the authenticity to admit what you don’t know and to learn from the woman running the small kiosk.” This rich feedback was instrumental in refining the value to ‘Authentic Humility,’ ensuring the final model is not just theoretically sound but also deeply culturally attuned and actionable for leaders on the ground (Table 3).

Category	Definition & Practical Focus	Specific Competencies	Refined, Practical Definition
Strategic Competencies	The knack for navigating complex, often unstable environments by seeing the whole picture, planning for the long term, and adapting quickly to new realities.	Systems Thinking	The ability to connect the dots between social, environmental, and economic pressures. Understands how a community protest, a new regulation, or a water shortage can impact the entire business.
	Stakeholder Engagement		Going beyond PR to genuinely build trust and co-create solutions with often marginalized groups (local communities, informal networks) and powerful actors (government, NGOs) simultaneously.

		Adaptability	The skill to pivot strategies with agility in the face of political shifts, economic volatility, and resource scarcity without losing sight of the long-term vision.
		Critical Reflexivity	The habit of constantly questioning one’s own assumptions and power. Asking: “Who is not in this room? How do our ‘est practices’ negatively impact the local ecosystem?”
		Anticipatory Thinking (Foresight)	Reading weak signals to anticipate future crises and opportunities, from climate migration patterns to shifts in global supply chains and preparing the organization accordingly.
Core Competencies	Abilities to drive innovation and make decisions that create tangible value for both the business and society, often with limited resources.	Frugal Innovation	Creating more social, environmental, and economic value with fewer resources. Designing affordable, sustainable solutions that are accessible to low-income populations.
		Inclusive Decision-Making	Ensuring the voices of women, youth, and other underrepresented groups are not just heard but are influential in shaping outcomes that affect them.
		Ecosystem Cultivation	Moving beyond “managing” stakeholders to actively nurturing and investing in the health of the entire business ecosystem –from local suppliers to natural resources– as a strategy for resilience.
Core Values	The non-negotiable ethical foundation that earns a leader legitimacy and trust, which is the ultimate currency in complex markets.	Moral Integrity	Consistently acting with honesty and fairness, especially when no one is watching. Resisting the pressure for short-cut solutions that compromise long-term community well-being.

		Stewardship & Legacy	A deep sense of responsibility for safeguarding resources and well-being for future generations, counteracting short-term profit pressures.
		Radical Respect	A genuine belief in the inherent dignity and value of every individual, from the factory floor to the farmer's field, and actively working to rectify power imbalances.
Collaborative Competencies	The skill of building bridges across deep divides of sector, culture, and power to achieve goals no single organization can alone.	Cross-Sector Convening	The ability to act as a credible "honest broker" to bring competing businesses, government agencies, and community leaders to the same table to address systemic issues.
		Consensus Building	Facilitating dialogue to find a workable path forward amidst highly divergent interests, often relying on patient relationship-building rather than formal authority.
Personal Leadership Capacities	The inner resilience and self-knowledge required to lead sustainably through intense pressure and paradox.	Contextual Self-Awareness	Understanding how one's own background, biases, and position of power are perceived within the local cultural and social context.
		Resilience & Composure	The emotional fortitude to withstand setbacks, manage constant ambiguity, and maintain optimism while dealing with daunting developmental challenges.
		Authentic Humility	The confidence to admit what you don't know, to defer to local expertise, and to lead with a sense of service rather than ego.

Table 3. Finalized Sustainable Leadership Competency Model for Emerging and Developing Economies.

Discussion and Implications

The Sustainable Leadership Competency Model (SLCM) developed in this study advances both theory and practice by contextualizing global leadership frameworks for the realities of Emerging Markets and Developing Economies (EMDEs). While prior scholarship has emphasized universal competencies such as systems thinking, stakeholder engagement, and ethical conduct (Avery & Bergsteiner, 2011; Ferdig, 2007; Liao, 2022), this study demonstrates that their practical expression requires adaptation to the socio-economic volatility, institutional fragility, and cultural pluralism of EMDE contexts.

Theoretical Contributions

First, the refinement of Frugal Innovation expands the literature on innovation-oriented leadership by embedding resource-constraint awareness into competency models. Whereas prior models emphasize broad “social innovation,” our findings show that leaders in EMDEs must demonstrate *Jugaad*-like ingenuity-designing affordable, scalable solutions under scarcity. This aligns with the sustainability-innovation nexus (Nidumolu, Prahalad, & Rangaswami, 2009) while extending it by foregrounding the role of contextual necessity in shaping innovative leadership practices.

Second, the introduction of Critical Reflexivity contributes to critical leadership studies by positioning reflexivity not merely as self-awareness but as a power-conscious practice (Alvesson & Spicer, 2012). In volatile institutional environments, leaders must interrogate whose interests are privileged and whose voices are marginalized in decision-making. This reframing connects sustainable leadership to broader debates on equity, representation, and ethical stewardship.

Third, Authentic Humility advances leadership theory by enriching the literature on humility in leadership (Owens & Hekman, 2012). Traditional definitions of authenticity risk legitimizing destructive traits if leaders act “true to self” without ethical grounding. Our refinement emphasizes humility as the safeguard - requiring leaders to admit limitations, defer to local expertise, and lead with service rather than ego. This aligns with paradox theory (Smith & Lewis, 2011), highlighting how leaders in EMDEs balance confidence with vulnerability to build legitimacy and trust in contexts of systemic inequality.

Collectively, these refinements demonstrate that sustainability competencies are not static or universal but contextually mediated expressions of global principles, shaped by institutional voids, cultural traditions, and developmental constraints.

Practical and Policy Implications

The findings also provide actionable insights for practitioners and policy-makers. At the organizational level, companies operating in EMDEs can embed the SLCM into leadership development programs, succession planning, and performance management systems. For example, assessment centers and 360-degree feedback instruments can explicitly measure competencies such as Critical Reflexivity and Authentic Humility alongside traditional managerial skills.

At the educational level, business schools and training institutions should integrate frugal innovation case studies, indigenous leadership philosophies (Ubuntu, Buen Vivir, Bodhisattva), and experiential learning modules that simulate resource-constrained decision-making. This would foster leaders who can operate effectively within EMDE realities rather than relying on transplanted Western models.

At the policy level, governments and multilateral organizations can create enabling environments by embedding these competencies into leadership accreditation frameworks, funding criteria, and capacity-building initiatives. For instance:

Development banks could require evidence of ecosystem cultivation and stakeholder engagement in loan and investment criteria.

Ministries of education and labor could incentivize universities to align leadership curricula with competencies such as Frugal Innovation and Radical Respect.

Cross-sector platforms could be established to convene leaders from business, civil society, and government, institutionalizing consensus-building as a leadership practice.

In sum, the SLCM offers a concrete roadmap for cultivating sustainable leaders who are not only ethically grounded and strategically adept but also culturally responsive and contextually resilient. By connecting refinements to established leadership theories and outlining specific organizational and policy pathways, this study strengthens the bridge between theory and practice while addressing the urgent leadership needs of EMDEs.

Conclusion

This study successfully developed and validated a comprehensive Sustainable Leadership Competency Model specifically designed for the unique contexts of emerging and developing economies. By integrating a systematic review of global literature with rich, qualitative insights from regional experts, the research moves beyond a one-size-fits-all approach to leadership development. The final model, comprising Strategic Competencies, Core Competencies, Core Values, Collaborative Competencies, and Personal Leadership Capacities, represents a nuanced framework that is both academically grounded and practically actionable. It provides a critical answer to the pressing need for leaders who can navigate inherent volatilities, bridge deep societal divides, and drive growth that is not only economic but also inclusive, resilient, and sustainable (Figure 1).

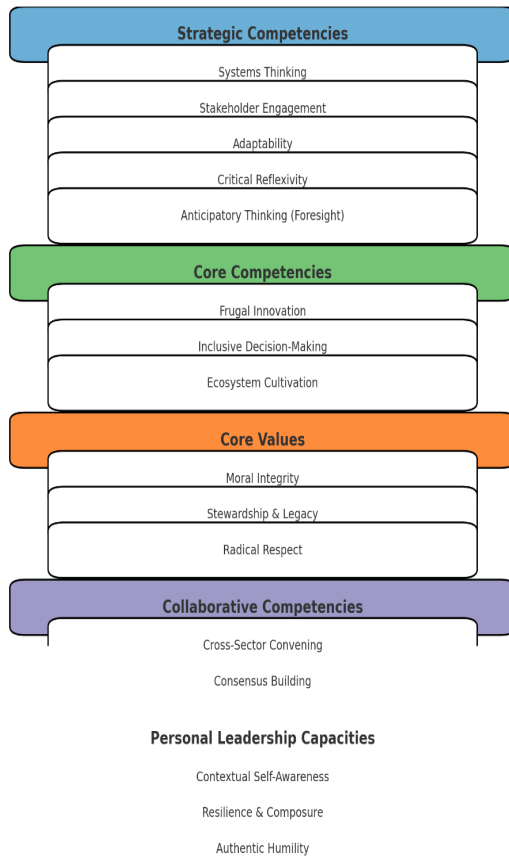


Figure 1. Sustainable Leadership Competency Model.

Limitations and Future Research Recommendations

Despite its contributions, this study has limitations that pave the way for future research. The primary limitation is the qualitative nature of the validation phase, which, while providing depth, limits the statistical generalizability of the findings across all emerging markets.

1. Future Research Direction 1: The logical next step is to develop a quantitative instrument, such as a survey scale based on this model, and to test its predictive validity through large-scale studies across different countries and sectors to establish its generalizability and measure its impact on organizational sustainability performance.

2. Future Research Direction 2: Researchers should employ a longitudinal design to track leaders who exhibit these competencies over time, providing causal evidence of how they directly influence long-term organizational resilience and community impact.

3. Future Research Direction 3: Further investigation could explore the cultural nuances between different emerging regions (e.g., Southeast Asia vs. Latin America vs. Africa) to identify if and how the relative weight or expression of certain competencies differs, leading to even more finely tuned regional models.

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The Education Spending Paradox: Cross-Sectional Evidence and Dynamic Analysis for Mena and African Economies

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Abstract

This study investigates the complex relationship between education spending and economic productivity across 164 countries from 1988 to 2023, with a detailed focus on 38 Mena and Sub-Saharan African economies. Using a novel productivity measure (*verim*) that captures a country's relative economic efficiency, we first establish a stylized fact: a consistent, negative correlation between education spending as a percentage of government expenditure and short-term productivity. To unpack this finding, we employ Autoregressive Distributed Lag (ARDL) and Nonlinear ARDL (NARDL) methodologies. The dynamic analysis reveals that while short-term productivity trade-offs are common, the long-run effects are highly heterogeneous and often asymmetric. Many Mena and African countries show positive long-run productivity gains from increased education spending, but the response to spending increases often differs significantly from the response to cuts. Our findings suggest that policymakers must manage immediate productivity costs while fostering long-term human capital growth, emphasizing the need for stable, context-specific education investment strategies.

Keywords: Education Spending, Economic Productivity, ARDL, NARDL, Human Capital, Mena and African Economies

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Introduction

The relationship between education spending and economic productivity is a cornerstone of development economics. Grounded in human capital theory (Becker, 1964), the consensus holds that education investment should enhance long-term economic performance. However, empirical evidence often reveals a more complex dynamic, particularly in developing countries. This study examines a critical temporal trade-off: why does higher education spending as a percentage of government expenditure often correlate negatively with short-term economic productivity, even as human capital is built for the future?

This paper addresses this question in two stages. First, using comprehensive data for 164 countries from 1988-2023, we establish the existence of this trade-off as a global stylized fact. We use a novel productivity index, *verim*, which measures a country's share of global GDP relative to its share of global population. This index effectively isolates a country's relative economic efficiency from global shocks. Our cross-sectional analysis reveals a consistent negative correlation between the share of education in government spending and productivity.

Second, to move beyond this simple correlation and understand the underlying dynamics, we focus on 38 Mena and Sub-Saharan African economies. The motivation for this focus is threefold: Mena and African nations face acute fiscal constraints requiring careful investment prioritization; variations in institutional quality provide a rich context for analysis; and the region's demographic dividend is critically dependent on effective human capital formation. Additionally, institutional quality variations across Mena and African countries provide natural experiments for understanding how governance contexts moderate education effectiveness. Finally, the region's young demographic profile makes education investment particularly relevant for long-term development prospects. We apply Autoregressive Distributed Lag (ARDL) and Non-linear ARDL (NARDL) models to disentangle the short-run costs from the long-run benefits of education spending.

Our central research question is: How can the negative short-term relationship between education spending and productivity be reconciled with the positive long-run goals of human capital development? We hypothesize that education investment imposes immediate opportunity costs that depress current productivity but yields positive long-run gains. The magnitude and speed of these effects are expected to depend on country-specific institutions and economic contexts.

Our key findings challenge conventional wisdom about education investment. While cross-sectional analysis confirms negative contemporaneous relationships between education spending intensity and productivity, the time-series analysis reveals important heterogeneity across Mena and African countries. Some nations show positive long-run education effects despite negative short-run relationships, while others demonstrate more complex non-linear patterns captured by our NARDL specifications.

This study contributes to the literature in several ways. We provide comprehensive empirical evidence of the education spending paradox across a large sample of countries and over a 35-year span. Our productivity measure offers a novel perspective on economic efficiency that complements traditional growth measures, and applying ARDL and NARDL methodologies to individual Mena and African countries provides nuanced insights into country-specific dynamics that aggregate studies may miss.

The paper proceeds as follows. Section 2 reviews the relevant literature. Section 3 details our data, the construction of the *verim* index, and our econometric methodology. Section 4 presents the global cross-sectional results. Section 5 discusses the country-specific ARDL and NARDL results for Mena and African economies. Section 6 concludes with policy implications.

Our findings have important implications for education policy in developing countries. The existence of short-term productivity costs from education spending suggests that countries may need complementary policies to manage transition periods. Furthermore, heterogeneity across Mena and African countries indicates that one-size-fits-all approaches may be inappropriate, with country-specific factors determining optimal education investment strategies. Understanding these dynamics is crucial for designing effective development policies that balance immediate needs with long-term growth objectives.

Literature

The relationship between education investment and economic productivity presents one of development economics' most enduring puzzles. Recent literature (2020-2025) reveals that increased education spending often fails to translate into improved economic outcomes and can even generate negative short-term effects under specific institutional conditions (Li et al., 2024; Wang & Zhang, 2024; Kouam et al., 2022). This paradox challenges conventional human capital theory and demands sophisticated analytical approaches. The evidence suggests that

institutional quality, measurement frameworks, and regional contexts fundamentally moderate education-growth relationships, requiring more nuanced theoretical and empirical approaches (Angrist et al., 2021; McNeal et al., 2024).

Contemporary theoretical advances have significantly refined our understanding of education-productivity linkages through several key innovations. The learning-schooling distinction represents perhaps the most fundamental theoretical breakthrough (Angrist et al., 2021). Using the Harmonized Learning Outcomes database, Angrist et al. (2021) demonstrate that human capital accounts for 20-50% of cross-country income differences when measured by learning outcomes, compared to inconsistent results with traditional schooling-based measures. This finding challenges the foundational assumption in human capital theory that years of education serve as adequate proxies for productive capabilities.

Endogenous growth models have evolved to incorporate multiple transmission channels through which education affects productivity (Kouam et al., 2022). Recent theoretical work identifies four distinct mechanisms: direct productivity enhancement through cognitive skills, innovation acceleration through R&D capacity, spillover effects through knowledge externalities, and health-demographic channels affecting intergenerational transmission. These multi-channel models help explain why simple education spending increases often fail to generate expected productivity gains—the channels may operate with different time horizons and complementary requirements.

The institutional complementarity framework has emerged as a crucial theoretical innovation (Kouam et al., 2022; World Bank, 2024a). Models now incorporate how governance quality, corruption levels, and political stability interact with education investments to determine effectiveness. This framework provides theoretical grounding for observed education spending paradoxes, suggesting that education's productivity effects depend critically on complementary institutions rather than operating independently.

Skills mismatch theory represents another significant advance, with contemporary models emphasizing dynamic skill requirements and curriculum-labor market alignment problems (IMF, 2024; UNESCO, 2023). These models predict that education spending can have negative short-term effects when skills production doesn't match labor market demands, contributing to graduate unemployment and inefficient resource allocation.

The measurement revolution in education economics has fundamentally altered how researchers assess education-productivity relationships.

Learning-Adjusted Years of Schooling (LAYS) has emerged as the preferred metric, combining access and quality dimensions against cross-country standards (Angrist et al., 2021). This approach addresses the critical flaw in traditional measures that treated education as homogeneous regardless of quality variations.

Meta-analytical evidence reveals substantial heterogeneity in education-growth relationships. Churchill, Yew, and Ugur's (2017) comprehensive analysis of 237 estimates from 29 studies shows positive, statistically significant effects in developed countries but statistically insignificant associations in less developed countries. Benos and Zotou's (2014) meta-regression of 989 estimates finds substantial publication selection bias toward positive results, with genuine effects emerging only after accounting for this bias. These findings highlight the critical importance of methodological rigor and context-specific analysis.

Quality measurement innovations have moved beyond standardized test scores to incorporate multi-dimensional assessments including socio-emotional skills, technical competencies, and digital literacy (McNeal et al., 2024). Research using TIMSS 2019 data across 5,164 schools demonstrates that technical efficiency averages only 0.58-0.59, indicating schools could improve achievement by 25% with current inputs through better management practices. The cost-effectiveness measurement framework has gained prominence, with evidence showing that most effective interventions achieve up to 10 times better cost-effectiveness than business-as-usual approaches (McNeal et al., 2024). This metric helps explain education spending paradoxes by revealing that spending increases without targeting effective interventions often yield minimal returns.

The application of ARDL and NARDL methodologies to education-growth studies has yielded important insights into both linear and nonlinear relationships. ARDL applications have become standard for analyzing education-growth relationships due to their ability to handle mixed integration orders and provide clear short-run/long-run distinctions (Pesaran et al., 2001; Kripfganz & Schneider, 2023). Recent studies using enhanced Kripfganz-Schneider critical values show superior performance compared to traditional Pesaran bounds.

Key empirical findings from ARDL studies reveal complex patterns. Duwal and Suwal's (2024) analysis of Nepal (1990-2022) shows positive long-run impacts from educational indices but negative coefficients for government education expenditure, suggesting inefficiencies in spending mechanisms. Error correction terms typically indicate adjustment speeds of 11.5% to 48% annually, providing policy-relevant information about the timing of education effects.

NARDL applications have revealed important asymmetric relationships (Shin et al., 2014). Studies of brain drain effects show that education expenditure has positive asymmetric effects, while corruption and inequality have negative asymmetric impacts (African Economic Research Consortium, 2024). These findings suggest that education spending effectiveness varies depending on economic conditions and institutional contexts, providing empirical support for theoretical models emphasizing institutional complementarity.

Cross-sectional ARDL and panel ARDL innovations address cross-sectional dependency and heterogeneity concerns (Economic Research Forum, 2024). Applications to 88-country fiscal sustainability analysis and 38-country Sub-Saharan African studies demonstrate the robustness of findings across different geographical and temporal contexts.

MENA region studies reveal distinct patterns in education-productivity relationships (World Bank, 2024c). Despite higher baseline education levels compared to Sub-Saharan Africa, MENA countries face significant challenges in translating education investments into economic growth. Egypt's multiple ARDL studies show positive long-term relationships but highlight implementation challenges (El-Dib & Moawad, 2023; Yousif & Ahmed, 2024). The region's modest 2.6% growth projection for 2025 reflects broader structural constraints including limited private sector absorption capacity and low female labor force participation despite educational advantages.

Sub-Saharan African evidence presents both opportunities and constraints (IMF, 2024; African Development Bank, 2024). The region faces an unprecedented demographic dividend with working-age population growth, but current completion rates of 65% primary and 75% literacy fall well below global averages. Documented success stories include Kenya's Tusome program showing reading improvements equivalent to 3-5 years of schooling, and Rwanda's 70% employment success rate for NEET youth upskilling programs (World Bank, 2024a). However, the region faces a critical teacher shortage of 15 million to achieve SDG4, and learning poverty affects nearly 90% of children.

Cross-regional comparative analyses reveal important patterns (African Economic Research Consortium, 2024; Economic Research Forum, 2024). The African Economic Research Consortium's review of 145 empirical studies shows growing sophistication in program evaluation, while Economic Research Forum studies in MENA emphasize institutional quality effects. Both regions demonstrate that governance quality and management practices often matter more than resource levels for education effectiveness.

Recent literature has documented several specific mechanisms through which education spending generates negative or insignificant effects. The higher education overcapacity paradox represents a critical finding (Li et al., 2024). Li et al.'s (2024) analysis of 38 OECD countries shows that when higher education expansion exceeds optimal levels (quantile >0.7), it generates negative GDP growth effects with a coefficient of -0.813 , as investment costs exceed social benefits.

Brain drains effects create systematic negative returns in developing countries (African Development Bank, 2024). When skilled emigration exceeds 10-15%, negative effects dominate positive effects, as educated individuals emigrate before repaying societal investments. This creates particular challenges for small states and Sub-Saharan African countries with high emigration rates. Institutional quality deterioration significantly reduces education spending effectiveness (Kouam et al., 2022). Kouam, Nguena, and Nzue's (2022) analysis of 82 developing countries demonstrates that corruption, political instability, and poor governance reduce education productivity through unethical teacher behavior, under-qualified personnel recruitment, and resource misallocation.

The spending-learning disconnect presents a global challenge (World Bank, 2024a). World Bank Education Finance Watch 2024 reports that 53% of ten-year-olds in low- and middle-income countries cannot read age-appropriate text despite spending increases. This reflects broader inefficiencies in education system management rather than inadequate funding levels.

Contemporary research has decisively shifted toward quality-focused approaches (Angrist et al., 2021; McNeal et al., 2024). Evidence shows that learning-based measures demonstrate stronger associations with economic growth than enrollment-based measures, resolving the long-standing quantity versus quality debate. Copenhagen Consensus Centre (2023) estimates suggest every dollar invested in early childhood education in Sub-Saharan Africa yields up to \$33 in returns, but only when quality is maintained.

Technology-education complementarity has emerged as a critical policy consideration (UNESCO, 2023). UNESCO emphasizes technology as a complement to, rather than substitute for, quality human instruction. The COVID-19 transition of 1.5 billion students to online education revealed massive digital divides while demonstrating technology's potential when properly implemented with teacher support and institutional backing.

Governance innovations show promise for improving education effectiveness (Frontiers in Education, 2024). Studies demonstrate that academic freedom

shows the strongest positive correlation with education service quality, while accountability implementation can improve teaching and learning processes by 33% when properly managed. These findings suggest that institutional reforms may be more effective than spending increases for improving education outcomes.

Several important gaps remain in the education-growth literature. Causal identification remains challenging despite methodological advances, with most studies unable to definitively establish causal relationships due to reverse causality concerns and omitted variable bias (Churchill et al., 2017). The long-term effects problem persists, as most studies capture education spending costs in the short term while benefits emerge only after 13-15 years.

Technology integration research lags behind rapid technological change (UNESCO, 2023). Limited theoretical work exists on how digital technologies fundamentally alter education production functions and optimal investment strategies. Similarly, climate change impacts on education systems and optimal adaptation strategies remain under-researched. Regional heterogeneity requires more attention, particularly regarding optimal education policies across different institutional and economic contexts (World Bank, 2024c). The informal sector's role in education returns remains poorly understood, despite its dominance in many developing economies.

Skills complementarity with technological change needs deeper investigation, particularly how artificial intelligence affects returns to different types of human capital (IMF, 2024). The integration of social capital theory with human capital models also remains underdeveloped.

The reviewed literature suggests several priorities for ARDL/NARDL applications in education-growth research. Asymmetric relationships appear common, supporting NARDL applications to capture nonlinear adjustment processes (Shin et al., 2014; Duwal & Suwal, 2024). The documented education spending paradoxes suggest that threshold effects and regime-switching models may prove valuable for understanding when education spending transitions from positive to negative effects.

Institutional quality variables emerge as essential moderators that should be incorporated into ARDL/NARDL specifications (Kouam et al., 2022). The quality versus quantity distinction suggests that using learning outcome measures rather than enrollment data may improve model performance and policy relevance (Angrist et al., 2021). Regional applications should account for specific institutional contexts and development challenges (El-Dib & Moawad, 2023; Yousif &

Ahmed, 2024). The success of country-specific ARDL studies in Egypt, Nepal, and Nigeria suggests that regional analyses using similar methodologies could yield important policy insights for MENA and African economies.

This evolving understanding suggests that the education spending paradox is not an indictment of education investment per se, but rather a call for more sophisticated approaches that prioritize institutional quality, targeted interventions, and evidence-based implementation over simple spending increases (McNeal et al., 2024; UNESCO, 2023).

Materials and Methods

Data Sources and Sample Construction

This study utilizes data from the World Bank's World Development Indicators (WDI) database spanning 164 countries over the period 1988-2023. The dataset comprises the following variables: GDP at current market prices (NY.GDP.MKTP.CD), total population (SP.POP.TOTL), education expenditure as percentage of government expenditure (SE.XPD.TOTL.GB.ZS), education expenditure as percentage of GDP (SE.XPD.TOTL.GD.ZS), government final consumption expenditure as percentage of GDP (NE.CON.GOV.T.ZS), and the Human Capital Index (HD.HCI.OVRL).

Countries were classified using WDI regional and income classifications, excluding aggregate regions to focus on individual sovereign states. For the MENA and Sub-Saharan African subsample, we selected 38 countries with adequate time-series coverage for robust econometric analysis, requiring a minimum of 15 consecutive annual observations.

Productivity Measure Construction

Our dependent variable, productivity (*verim*), represents economic efficiency relative to global benchmarks. A key advantage of this measure is its insensitivity to global shocks that affect all countries proportionally, thus isolating country-specific relative efficiency. The construction follows three steps:

First, we calculate each country's GDP share relative to world GDP:

$$\text{Country.GDP.Share} = \left(\frac{\text{Country.GDP}}{\text{World.GDP}} \right) \cdot 100$$

Second, we compute each country's population share relative to world population:

$$\text{Country.Population.Share} = \left(\frac{\text{Country.Population}}{\text{World.Population}} \right) \cdot 100$$

Third, productivity is defined as the ratio of GDP share to population share:

$$\text{Productivity (verim)} = \frac{\text{Country.GDP.Share}}{\text{Country.Population.Share}}$$

This measure captures how efficiently a country utilizes its human resources relative to the global economy. Values above 1 indicate above-average productivity, while values below 1 suggest below-average efficiency.

Cross-Sectional Analysis

To establish global stylized facts regarding the education-productivity relationship, we estimate annual cross-sectional regressions for each year t from 1989 to 2023:

$$\text{verim}_{it} = \alpha_t + \beta_t \cdot \text{SE.XPD.TOTL.GB.ZS}_{it} + \epsilon_{it}$$

Where:

verim_{it} is the productivity measure for country I in year t . $\text{SE.XPD.TOTL.GB.ZS}_{it}$ is education spending as percentage of government expenditure. This approach generates 35 annual coefficient estimates, providing temporal evidence of the education spending-productivity relationship across varying global economic conditions.

Individual Country Time-Series Analysis

For the 38 MENA and Sub-Saharan African countries, we employ time-series econometric techniques to analyze long-run and short-run dynamics. Prior to estimation, we conduct unit root testing using the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests to determine integration properties.

ARDL Bounds Testing Approach

We apply the Autoregressive Distributed Lag (ARDL) bounds testing methodology developed by Pesaran et al. (2001). The ARDL(p,q) model specification is:

$$\Delta verim_t = \psi + \eta_0 verim_{t-1} + \eta_1 SE.XPD.TOTL.GB.ZS_{t-1} + \sum_{j=1}^p \beta_{1j} \Delta verim_{t-j} + \sum_{j=0}^q \beta_{2j} \Delta SE.XPD.TOTL.GB.ZS_{t-j} + e_t$$

Where Δ represents first differences, and Cointegration is tested using the bounds test procedure, examining the null hypothesis $H_0: \eta_0 = \eta_1 = 0$ against $H_1: \eta_0 \neq 0$ and $\eta_1 \neq 0$.

When cointegration is established, we estimate the long-run equation:

$$verim_t = \alpha_0 + \alpha_1 SE.XPD.TOTL.GB.ZS_t + \epsilon_t$$

and the corresponding error correction model:

$$\Delta verim_t = \beta_0 + \sum_{j=1}^p \beta_{1j} \Delta verim_{t-j} + \sum_{j=0}^q \beta_{2j} \Delta SE.XPD.TOTL.GB.ZS_{t-j} + \theta \epsilon_{t-1} + e_t$$

Non-Linear ARDL (NARDL) Approach

To examine asymmetric responses to education spending changes, we employ the NARDL methodology of Shin et al. (2014). Education spending is decomposed into positive and negative partial sums:

$$SE.XPD.TOTL.GB.ZS_t^+ = \sum_{i=1}^t \max(\Delta SE.XPD.TOTL.GB.ZS_i, 0)$$

$$SE.XPD.TOTL.GB.ZS_t^- = \sum_{i=1}^t \min(\Delta SE.XPD.TOTL.GB.ZS_i, 0)$$

The NARDL specification becomes:

$$\begin{aligned} \Delta verim_{\tau} = & \psi + \eta_0 verim_{\tau-1} + \eta_1^+ SE.XPD.TOTL.GB.ZS_{\tau-1}^+ \\ & + \eta_1^- SE.XPD.TOTL.GB.ZS_{\tau-1}^- + \sum_{j=1}^p \beta_{1j} \Delta verim_{\tau-j} \\ & + \sum_{j=0}^q \beta_{2j}^+ \Delta SE.XPD.TOTL.GB.ZS_{\tau-j}^+ \\ & + \sum_{j=0}^m \beta_{2j}^- \Delta SE.XPD.TOTL.GB.ZS_{\tau-j}^- + e_{\tau} \end{aligned}$$

This specification permits testing for both short-run asymmetry ($\beta_{2j}^+ \neq \beta_{2j}^-$) and long-run asymmetry ($\eta_1^+ \neq \eta_1^-$) using Wald tests.

Model Selection and Diagnostic Testing

Optimal lag lengths for ARDL and NARDL models are determined using the Akaike Information Criterion (AIC) with maximum lag order constrained by data availability.

All models undergo comprehensive diagnostic testing including: (i) bounds testing for cointegration using Pesaran et al. (2001) critical values; (ii) Banerjee et al. (1998) test for cointegration confirmation; (iii) Lagrange Multiplier test for serial correlation; (iv) Breusch-Pagan test for heteroskedasticity; (v) CUSUM and CUSUMSQ tests for parameter stability; and (vi) Jarque-Bera test for normality of residuals.

Data Description

Table 1 presents comprehensive summary statistics revealing substantial cross-country variation in key variables. The productivity measure exhibits considerable heterogeneity with a mean of 1.58 and standard deviation of 2.44, indicating significant dispersion in economic efficiency across the global sample. The substantial ranges from 0.005 to 21.75 underscores the wide productivity differentials characterizing the international economy.

GDP levels display extreme variation, ranging from \$7 million to \$27.7 trillion (current USD), reflecting the inclusion of both small island states and major economic powers in our sample. Population statistics similarly span several orders of magnitude, from approximately 8,000 to 1.4 billion inhabitants, ensuring broad representation across demographic scales.

Education expenditure as percentage of government budgets averages 14.6% globally, with substantial variation ranging from 1.7% to 44.8%. This wide distribution reflects diverse policy priorities, fiscal constraints, and institutional arrangements across countries. Notably, the observation count for education variables (3,053 vs. 5,904 total observations) indicates data availability constraints, particularly affecting developing economies in our MENA and African subsample.

Variable	Observations	Mean	Median	Std Dev	Minimum	Maximum
Productivity (<i>verim</i>)	5,904	1.58	0.45	2.44	0.005	21.75
GDP (current USD, million)	5,904	322,514	15,867	1,429,892	7	27,720,709
Population (total, thousand)	5,904	38,338	7,142	139,935	8	1,438,069
Education % of Gov Budget	3,053	14.62	14.08	4.93	1.70	44.80
Education % of GDP	3,501	4.32	4.12	2.01	0.00	44.33
Government Consumption % GDP	4,711	16.01	15.14	7.44	2.05	76.22

Table 1. Summary Statistics for Key Variables.

Note: Education variables show fewer observations due to data availability constraints Table 2 reveals systematic regional differences in productivity performance that motivate our analytical approach. North America exhibits the highest mean productivity (6.57 ± 2.40), followed by Europe & Central Asia (3.97 ± 3.60). These patterns reflect the concentration of advanced economies with sophisticated technological capabilities and efficient institutional frameworks.

In contrast, Sub-Saharan Africa (0.21 ± 0.29) and South Asia (0.20 ± 0.22) demonstrate substantially lower productivity levels, highlighting persistent development gaps. The Middle East & North Africa region occupies an intermediate position (1.76 ± 1.81), displaying considerable internal variation that reflects the heterogeneous economic structures characterizing this region.

These regional disparities provide strong empirical justification for our focused analysis of MENA and African economies, as these regions face acute challenges in translating educational investments into productivity gains while confronting severe fiscal constraints requiring careful resource allocation.

Region	Countries	Observations	Mean Productivity \pm SD
North America	3	108	6.574 \pm 2.402
Europe & Central Asia	32	1,152	3.973 \pm 3.6
Middle East & North Africa	17	612	1.761 \pm 1.812
East Asia & Pacific	29	1,044	1.379 \pm 1.82
Latin America & Caribbean	33	1,188	0.946 \pm 0.806
Sub-Saharan Africa	44	1,584	0.209 \pm 0.293
South Asia	6	216	0.201 \pm 0.22

Table 2. Regional Distribution and Productivity Statistics.

Note: Productivity measured as ratio of GDP share to population share relative to world

Figure 1 provides visual confirmation of these statistical patterns through distribution plots of productivity (*verim*) across regional and income group classifications. The visualization clearly demonstrates the hierarchical structure evident in the summary statistics, with high-income countries clustering at higher productivity levels while low-income countries concentrate in lower ranges. This systematic pattern validates both our productivity measure construction and the theoretical framework linking development stages to economic efficiency.

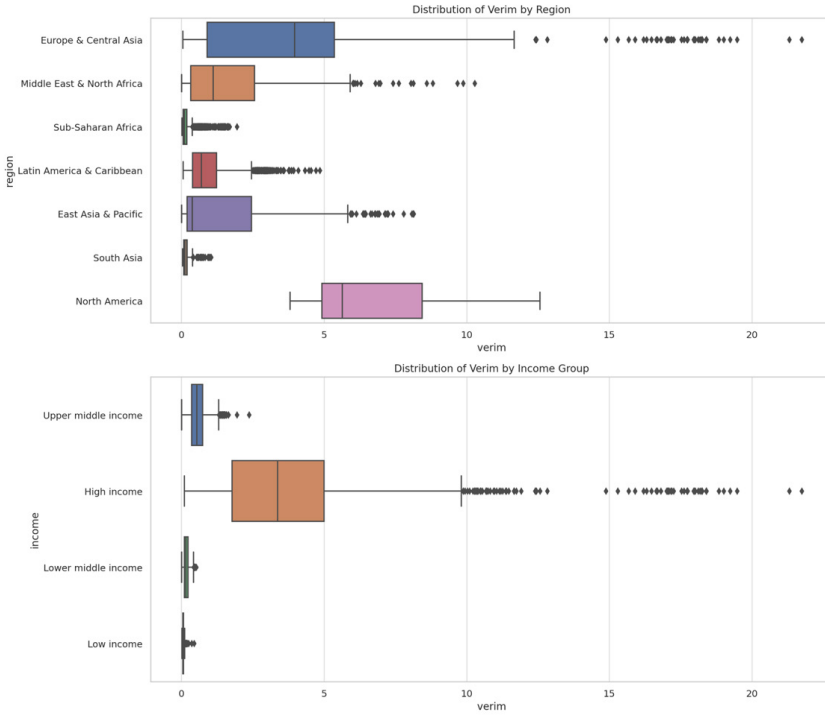


Table 1. Distribution of Productivity (*verim*) by region and income groups.

The temporal evolution of productivity rankings provides additional insights into regional performance dynamics. Figures 2 and 3 present comprehensive ranking trajectories for all 61 MENA and African countries over the study period, divided across two panels for visual clarity. The color-coding system reveals striking patterns: blue trajectories indicate countries improving their global productivity rankings, while red trajectories demonstrate declining performance relative to international benchmarks.

The predominance of red trajectories, particularly among Sub-Saharan African economies, illustrates widespread productivity deterioration despite significant educational investments during this period. Notable exceptions include Equatorial Guinea, which achieved a remarkable 74-rank improvement, and Cabo Verde with a 16-rank advancement. Conversely, substantial productivity declines characterize major regional economies including Cameroon (+42 ranks), South Africa (+30 ranks), and Libya (+46 ranks), suggesting that education spending increases have not translated into commensurate productivity gains in these contexts.

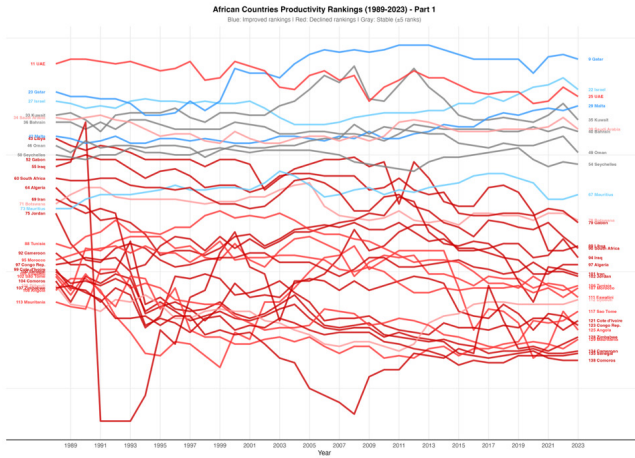


Table 2. The temporal evolution of productivity rankings, Part 1.

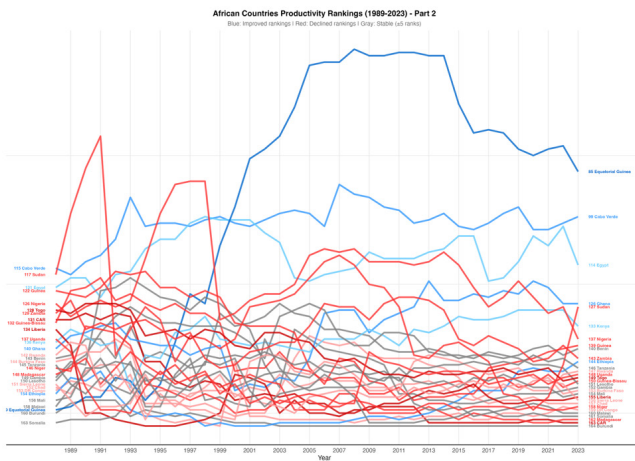


Table 3. The temporal evolution of productivity rankings, Part 2.

Figure 4 provides spatial context through a choropleth map of Africa and the Middle East, revealing distinct geographic clustering patterns. West African countries predominantly display red coloring (declining productivity), while scattered blue areas (improving productivity) appear primarily in Eastern and Southern Africa. This geographic distribution suggests that regional factors –including institutional spillovers, trade networks, and conflict exposure– may significantly influence the effectiveness of education investments, supporting our motivation for country-specific analytical approaches.

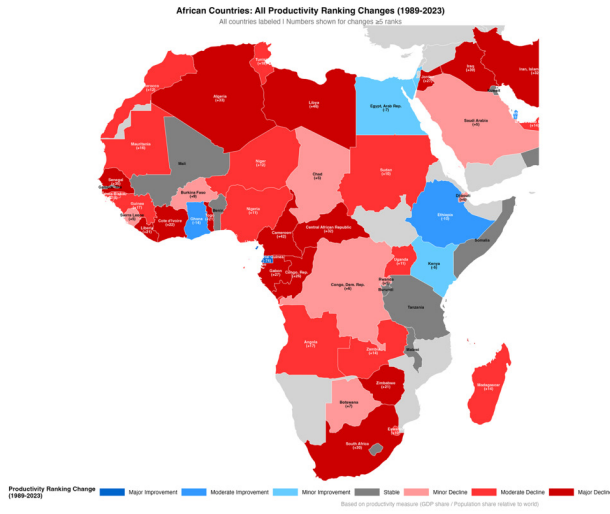


Table 4. A choropleth map of Africa and the Middle East.

Figure 5 positions African performance within global perspective, demonstrating that the continent’s concentration of productivity declines contrasts sharply with other world regions. Europe, North America, and East Asia exhibit predominantly stable or improving productivity trends, while Africa shows the highest global concentration of deteriorating economic efficiency. This stark regional divergence underscores the particular challenges facing African policymakers in translating education investments into measurable economic gains and justifies our focused examination of education-productivity dynamics in this regional context.

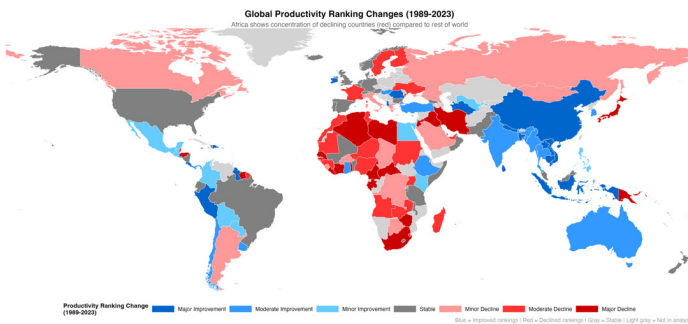


Table 5. A choropleth map of World.

A central empirical finding that motivates our entire analytical framework emerges from the temporal relationship between education spending and productivity across countries. Figure 6 presents the core stylized fact underlying our research: annual cross-sectional correlations between education spending (as percentage of government expenditure) and productivity levels remain consistently negative throughout the period 1989-2023.

The correlation coefficients fluctuate within a narrow band between -0.15 and -0.30, demonstrating remarkable temporal stability across diverse global economic conditions including the Asian financial crisis (1997-1998), the global financial crisis (2008-2009), and the COVID-19 pandemic (2020-2021). This persistence across varying macroeconomic environments provides compelling evidence that the negative relationship reflects fundamental economic mechanisms rather than period-specific artifacts or measurement errors.

The consistency of this pattern across three decades establishes what we term the “education spending paradox” the systematic tendency for countries allocating larger budget shares to education to exhibit lower contemporaneous productivity levels. While seemingly counterintuitive given human capital theory predictions, this relationship forms the empirical foundation for our subsequent dynamic analysis using ARDL and NARDL methodologies to disentangle short-term adjustment costs from long-term productivity benefits.

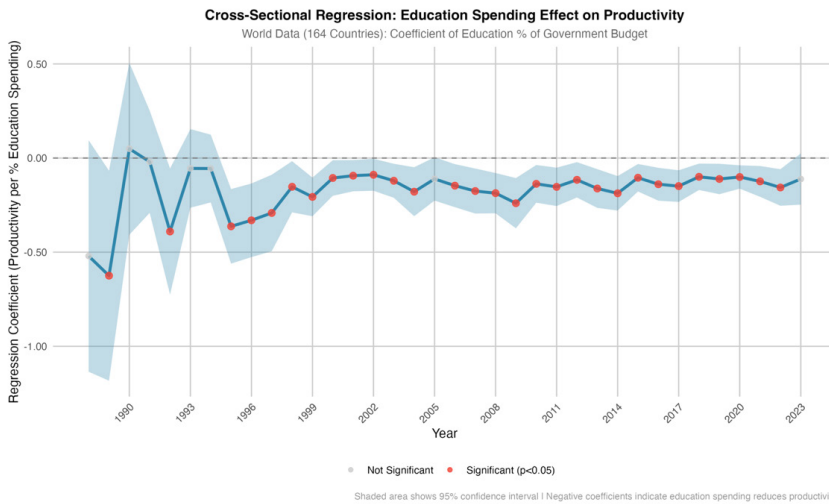


Table 6. Cross Sectional Regressions.

These regional disparities, combined with the global education spending paradox documented in Figure 6, provide compelling empirical justification for our focused analysis of MENA and African economies. These regions face acute challenges in translating educational investments into productivity gains while confronting severe fiscal constraints requiring careful resource allocation, making the understanding of education-productivity dynamics particularly policy-relevant in these contexts.

The 35-year temporal span (1988-2023) encompasses multiple global economic cycles, providing robust coverage of diverse macroeconomic conditions. This extended timeframe captures the effects of major economic transitions including the end of the Cold War, Asian financial crisis (1997-1998), global financial crisis (2008-2009), and the COVID-19 pandemic (2020-2021), enabling assessment of education-productivity relationships across varying economic environments.

Data completeness varies substantially across variables and country groups. While GDP and population data achieve near-complete coverage, education expenditure variables exhibit more limited availability, particularly for earlier time periods and lower-income countries. This pattern reflects the gradual development of international statistical capacity and standardized reporting frameworks, with implications for sample composition and potential selection bias that we address through our methodological approach.

Results and Discussion

A crucial strength of our empirical strategy lies in the construction of our productivity measure (*verim*). By calculating productivity as the ratio of a country's share of global GDP to its share of global population, we effectively eliminate common global shocks that affect all countries proportionally. This measure captures relative economic efficiency: a value above 1 indicates that a country generates a disproportionately large share of global output relative to its population size, while values below 1 suggest underperformance relative to the global average. The mathematical construction –where $verim = (\text{Country GDP}/\text{World GDP}) / (\text{Country Population}/\text{World Population})$ – ensures that any global shock affecting world GDP uniformly cancels out in the ratio. This leaves only country-specific productivity differentials, which can arise from factors such as technology adoption, institutional quality, human capital effectiveness, and resource allocation efficiency. Consequently, when we find negative relationships between education

spending and this productivity measure, we can be confident that these reflect genuine country-specific trade-offs rather than artifacts of global economic cycles. The persistence of negative correlations across different global economic conditions (1988-2023) further validates that we are capturing fundamental economic relationships rather than period-specific global phenomena.

Our cross-sectional analysis across 164 countries from 1988-2023 reveals a remarkably consistent negative relationship between education spending as a percentage of government expenditure and productivity levels. As illustrated in Figure 6, the correlation coefficients remain negative throughout the entire sample period, fluctuating between -0.15 and -0.30. This temporal stability across three decades of varying global economic conditions warrants careful interpretation.

Model	N	Sig ECT	Sig SR	Sig LR	Cointe- grated	Mean R ²	No ARCH	Sig Asymmetry
ARDL	42	27	8	16	17	0.622	40	
NARDL	28	16	16	17	17	0.841	27	13

Table 7. Summary Table for Results.

Summary Statistics. Sig = number of countries with significant coefficients. Cointegrated = number of countries with cointegration. No ARCH = number of countries passing ARCH test.

The persistence of negative correlations raises important methodological questions. While one interpretation suggests a genuine trade-off between education investment and contemporaneous productivity, alternative explanations merit consideration. The global nature of this negative trend may indicate potential endogeneity issues. Countries experiencing productivity declines might systematically increase education spending as a policy response, creating reverse causation that biases our cross-sectional estimates. Additionally, omitted variables such as institutional quality, demographic transitions, or technological change could drive both education spending decisions and productivity outcomes, generating spurious correlations.

Despite these concerns, the stability of coefficients across diverse economic periods –including the Asian financial crisis (1997-1998), the global financial crisis (2008-2009), and the COVID-19 pandemic (2020-2021)– suggests that the relationship transcends specific economic shocks. This persistence across different global conditions provides some reassurance that we are capturing a fundamental economic relationship rather than period-specific artifacts.

Country	Unit Root Tests			Decision
	ADF	PP	KPSS	
Algeria	-1.963	-7.967	0.139	Mixed
Angola	-1.531	-4.871	0.324	Mixed
Bahrain	-2.332	-20.858**	0.214	I(0)
Benin	-1.719	-13.580	0.636**	I(1)
Botswana	-2.823	-18.769**	0.143	I(0)
Burkina Faso	-3.283*	-8.143	0.233	Mixed
Burundi	-3.683**	-4.999	0.707**	Mixed
Cabo Verde	-1.318	-9.142	0.830**	I(1)
Cameroon	-2.575	-14.658	0.617**	I(1)
Central African Republic	-3.768**	-5.250	0.661**	Mixed
Chad	-2.228	-5.010	0.253	Mixed
Congo, Rep.	-1.775	-6.257	0.193	Mixed
Cote d'Ivoire	-3.106	-14.532	0.149	Mixed
Eswatini	-1.332	-8.580	0.448*	Mixed
Ethiopia	-3.833**	-1.729	0.459*	I(0)
Gabon	-2.657	-9.924	0.503**	I(1)
Gambia, the	-2.287	-13.357	0.614**	I(1)
Ghana	-2.188	-6.927	0.787**	I(1)
Guinea	1.070	1.479	0.623**	I(1)
Iran, Islamic Rep.	-1.712	-6.436	0.177	Mixed
Israel	-2.240	-6.068	0.333	Mixed
Kuwait	-1.440	-4.547	0.237	Mixed
Lesotho	-0.759	-5.776	0.297	Mixed
Madagascar	-3.200	-21.420**	0.867**	Mixed
Mali	-2.756	-9.801	0.552**	I(1)
Malta	-2.122	-16.142*	0.967**	I(1)
Mauritius	-1.792	-9.895	0.846**	I(1)

Country	Unit Root Tests			Decision
	ADF	PP	KPSS	
Morocco	-0.870	-13.660	0.465**	I(1)
Niger	-4.360**	-7.257	0.310	I(0)
Oman	-1.459	-5.609	0.344	Mixed
Qatar	-1.303	-5.129	0.571**	I(1)
Rwanda	-3.399*	-7.722	0.339	Mixed
Sao Tome and Principe	-1.005	-1.974	0.253	Mixed
Saudi Arabia	-2.646	-10.904	0.212	Mixed
Senegal	-3.210	-6.406	0.480**	I(1)
Seychelles	-3.126	-11.442	0.090	Mixed
Sierra Leone	-1.607	-12.137	0.623**	I(1)
South Africa	-1.482	-7.990	0.286	Mixed
Tanzania	-4.037**	-15.427	0.772**	Mixed
Togo	-3.871**	-7.504	0.581**	Mixed
Tunisia	-0.698	-1.678	0.267	Mixed
Uganda	-2.582	-14.427	0.439*	Mixed

Table 8. Unit Root Results.

Notes: ***, **, * denote significance at 1%, 5%, and 10% levels, respectively. ADF = Augmented Dickey-Fuller test, PP = Phillips-Perron test, KPSS = Kwiatkowski-Phillips-Schmidt-Shin test. For ADF and PP tests, H_0 : unit root (non-stationary). For KPSS test, H_0 : stationary. $I(0)$ = stationary, $I(1)$ = non-stationary, Mixed = conflicting results.

The comparison between ARDL (Table 3) and NARDL (Table 4) results reveals substantial differences that justify our asymmetric modeling approach. These divergences manifest in several dimensions, suggesting that the linear ARDL framework may obscure important nonlinearities in the education-productivity relationship.

Consider Burundi as an illustrative example. The ARDL model shows a positive contemporaneous effect (0.055) with an insignificant long-run coefficient (-0.0185) and a modest error correction term (-0.187). However, the NARDL specification reveals a more complex reality: positive changes in education

spending have a positive short-run effect (0.0374) and long-run effect (0.0432), while negative changes show even stronger positive effects (0.0757 short-run, 0.0901 long-run). The error correction term dramatically increases to -1.937, suggesting much faster adjustment when asymmetries are acknowledged. This stark difference implies that Burundi's education-productivity relationship fundamentally differs depending on the direction of spending changes a nuance completely missed by linear specifications.

Similarly, Ghana presents a compelling case for asymmetric modeling. The ARDL results indicate an insignificant contemporaneous effect (-0.0377) with a positive but insignificant long-run effect (0.8924) and slow adjustment (-0.162). The NARDL model, however, uncovers significant asymmetries: spending increases show positive long-run effects (0.4636, significant at 1%), while decreases have insignificant effects (0.0232). The error correction term accelerates to -1.304, indicating rapid adjustment once asymmetries are incorporated. This pattern suggests that Ghana benefits from education expansion but does not suffer proportionally from contractions-possibly due to hysteresis effects where human capital, once built, persists even with reduced funding.

Iran provides perhaps the most dramatic illustration of why NARDL modeling is necessary. The ARDL model shows a negative contemporaneous effect (-1.1889) with an insignificant long-run effect (-1.4105). The NARDL specification reveals extreme asymmetry: positive spending changes generate strong negative effects (-6.9015 short-run, -41.0725 long-run), while negative changes show weaker effects (-1.5076 short-run, -30.4892 long-run). This asymmetry might reflect Iran's unique economic structure, where education expansion during periods of oil revenue abundance may crowd out private sector development more severely than education contractions stimulate it.

The error correction terms (ECT) in our ARDL and NARDL estimations reveal important insights about adjustment dynamics in African economies. Several countries exhibit ECT values below -1, which warrant careful interpretation. In the ARDL results, Botswana (-3.014), Bahrain (-1.530), Kuwait (-1.798), Madagascar (-1.012), and Uganda (-2.050) show ECT coefficients exceeding unity in absolute value. The NARDL specifications reveal even more pronounced adjustment speeds, with Burundi (-1.937), Cabo Verde (-2.718), Cameroon (-2.114), Central African Republic (-1.375), Ethiopia (-1.796), Ghana (-1.304), Israel (-1.367), Madagascar (-1.201), Togo (-2.030), and Sao Tome and Principe (1.518) displaying similar patterns. Rather than indicating model misspecification, these

values represent oscillatory convergence dynamics where systems overshoot their equilibrium before converging through dampened fluctuations. This phenomenon is particularly relevant for developing economies undergoing structural adjustments, as established in the theoretical literature on cointegration (Loayza & Rancière, 2005). The rapid adjustment mechanisms likely reflect the volatile nature of education policy implementation in African contexts, where policy changes can trigger swift reallocations of resources that temporarily overshoot optimal levels before stabilizing.

The prevalence of asymmetric effects across our Mena and African sample – with 12 countries showing significant short-run asymmetries and 8 showing long-run asymmetries – suggests that linear models may systematically misrepresent the education-productivity relationship. Several theoretical mechanisms could generate such asymmetries:

Capacity Constraints: Education system expansion may hit diminishing returns more quickly than contractions increase returns. When countries like Mali expand education spending, they may struggle to maintain quality, leading to negative productivity effects (-0.7656 short run from positive changes). However, spending reductions might eliminate only the least effective programs, generating smaller impacts (0.0291 from negative changes).

Adjustment Costs: The asymmetric adjustment speeds revealed by NARDL models suggest that economic systems respond differently to education expansion versus contraction. Cabo Verde's error correction term jumps from -0.798 in ARDL to -2.718 in NARDL, indicating overshooting dynamics when asymmetries are considered. This might reflect rigid labor markets that slowly absorb new graduates but quickly shed educational infrastructure during contractions.

Threshold Effects: Some countries may operate near critical thresholds where education system characteristics change discretely. Mauritius shows insignificant effects in NARDL for both positive and negative changes, but with different magnitudes and signs, suggesting it may have reached an education saturation point where marginal changes have minimal impact.

The global negative correlation between education spending and productivity naturally raises endogeneity concerns that warrant careful consideration. Several features of our analysis help address these concerns, though we acknowledge they cannot be completely eliminated:

Our use of ARDL and NARDL methods exploits the time series properties of the data, moving beyond simple correlations. The bounds testing approach

accommodates variables with different integration orders, reducing the risk of spurious regression. The significant error correction terms in most countries indicate genuine long-run relationships rather than spurious correlations. If endogeneity drove our results uniformly, we would expect similar patterns across countries. Instead, we observe substantial heterogeneity in both magnitude and sign of effects. Countries like Kuwait show positive long-run effects (41.42 in ARDL), while South Africa shows negative effects (-12.2), suggesting that country-specific factors dominate any global endogeneity bias.

Asymmetric Responses: The NARDL results provide additional evidence against simple reverse causation. If countries merely increased education spending in response to productivity declines, we would expect symmetric effects. Instead, the widespread asymmetries suggest that the relationship depends on the direction of change, inconsistent with simple endogenous policy responses.

Differential Adjustment Speeds: The variation in error correction terms across countries (from -0.032 in Tanzania to -3.014 in Botswana) indicates heterogeneous dynamic processes inconsistent with a uniform endogeneity mechanism. These differences more likely reflect genuine structural differences in how economies absorb education investments.

Methodological Contributions and Limitations

Our application of NARDL methodology to Mena and African education-productivity relationships represents a methodological advance in this literature. Previous studies typically assumed symmetric effects, potentially missing important policy-relevant nonlinearities. The dramatic differences between ARDL and NARDL results for countries like Burundi, Ghana, and Iran validate this methodological choice.

However, several limitations temper our conclusions. The relatively short time series for many Mena and African countries (16-29 observations) limits the power of our tests and may affect the reliability of long-run estimates. The absence of education quality measures forces us to rely on expenditure quantities, though spending efficiency likely varies substantially across countries. Our productivity measure, while intuitive, may not capture all relevant economic dimensions such as inequality or sustainability.

Furthermore, while ARDL/NARDL methods address some endogeneity concerns through their dynamic specification, they cannot eliminate all sources of bias. Time-varying omitted variables, measurement error in education spending data,

and potential structural breaks remain concerns. Future research employing instrumental variables or natural experiments would provide valuable robustness checks.

Implications for Development Policy

Our results suggest that policymakers should move beyond simple prescriptions about education spending levels. The widespread asymmetries indicate that the direction of change matters as much as the level, with some countries benefiting from expansion but not suffering proportionally from contraction, while others show the opposite pattern. This asymmetry implies that policy reversals may have unexpected consequences not predicted by linear models.

The heterogeneity across countries further suggests that optimal education policies depend critically on country-specific factors. While we cannot definitively identify these factors with our current data, the patterns suggest that economic structure, institutional quality, and existing education system characteristics all play roles. Countries should therefore carefully evaluate their specific circumstances rather than blindly following international best practices.

The rapid adjustment speeds in many NARDL models –often exceeding unity– indicate that education policy changes can have quick and potentially overshooting effects. This responsiveness suggests both opportunities and dangers: well-designed policies might yield benefits sooner than expected, but policy mistakes could also generate rapid deterioration. Careful monitoring and adaptive management therefore become essential elements of education policy in Mena and African contexts.

Country	N	Short-run Effects			Long-run	ECT	R ²	Diagnostic Tests			Lags
		Contem- poraneous	Total					ARCH	Bounds	Ba- nerjee	
Algeria	15	-1.0416	0.2353	-31.3948	-0.056	0.425	No ARCH	No	No	2	
Angola	19	0.6379	-4.0206	8.1587*	-0.717**	0.556	ARCH	No	No	3	
Bahrain	16	-6.2215*	-17.7493	-7.9969**	-1.530***	0.873	No ARCH	Yes	Yes	3	
Benin	26	-0.0157	-0.0157	-0.0068	-0.696***	0.488	No ARCH	Yes	Yes	1	
Botswana	17	1.2147	-1.0535	1.4237	-3.014**	0.918	No ARCH	Yes	Yes	3	

Country	N	Short-run Effects			Long-run	ECT	R ²	Diagnostic Tests			Lags
		Contem- poraneous	Total					ARCH	Bounds	Ba- nerjee	
Burki- na Faso	19	-0.0276	-0.2378	0.0944	-0.742***	0.824	No ARCH	Yes	Yes	3	
Burundi	27	0.0550***	0.1085	-0.0185	-0.187	0.758	No ARCH	No	No	4	
Cabo Verde	22	-0.3887	-0.3887	-1.4142	-0.798**	0.521	No ARCH	Yes	Yes	1	
Cameroon	23	0.0695	-0.0746	0.3227	-0.449	0.508	No ARCH	No	No	2	
Central African Republic	26	0.0844	-0.3914	0.3054	-0.313	0.566	No ARCH	No	No	4	
Chad	18	-0.2065*	-0.2065	-0.6774*	-0.412**	0.513	No ARCH	No	Yes	1	
Con- go, Rep.	18	0.2191	1.5816	-0.6919	-0.558**	0.941	No ARCH	Yes	Yes	4	
Cote d'Ivoire	27	0.1836	-0.4002	-0.0333	-0.140	0.506	No ARCH	No	No	4	
Eswatini	29	0.2617	0.2617	0.6920	-0.390***	0.309	No ARCH	Yes	Yes	1	
Ethiopia	23	-0.0415	-0.0415	1.4773	-0.032	0.200	No ARCH	No	No	1	
Gabon	18	-0.7959	1.5094	-6.6615*	0.890*	0.864	ARCH	No	No	4	
Gam- bia, The	24	-0.0269	0.5019	-0.4435***	-0.600***	0.841	No ARCH	Yes	No	4	
Ghana	23	-0.0377	0.0326	0.8924	-0.162*	0.791	No ARCH	No	No	3	
Guinea	26	0.0954	-1.1055	7.5085*	-0.084	0.512	No ARCH	No	No	4	
Iran, Is- lamic Rep.	28	-1.1889**	-1.1889	-1.4105	-0.168*	0.433	No ARCH	No	No	1	
Israel	23	-4.4057	-40.0462	24.0801**	-0.533**	0.561	No ARCH	No	No	3	
Kuwait	16	-0.5392	-137.5583	41.4194***	-1.798***	0.988	No ARCH	Yes	Yes	4	

Country	N	Short-run Effects			Long-run	ECT	R ²	Diagnostic Tests			Lags
		Contem- poraneous	Total					ARCH	Bounds	Ba- nerjee	
Lesotho	28	0.1029	0.1029	0.7248**	-0.135	0.295	No ARCH	No	No	1	
Mada- gascar	23	-0.0196	0.2707	-0.0851	-1.012***	0.632	No ARCH	Yes	Yes	4	
Mali	22	-0.0247	-0.0800	0.0600	-0.371**	0.415	No ARCH	No	Yes	2	
Malta	27	-2.5173	-2.5173	-122.1905	0.032	0.465	No ARCH	No	No	1	
Mauritius	21	4.1645*	4.1645	101.5538**	-0.046	0.661	No ARCH	Yes	No	1	
Morocco	18	-0.3492	1.9490	-1.0116*	-1.775	0.887	No ARCH	No	No	4	
Niger	24	0.0139	0.0414	-0.0180	-0.300***	0.515	No ARCH	No	Yes	3	
Oman	23	-8.0338***	-8.0338	10.3547**	-0.340**	0.696	No ARCH	No	No	1	
Qatar	18	26.5948	-266.2628	92.9737**	-1.414**	0.868	No ARCH	Yes	Yes	4	
Rwanda	19	-0.0768	0.0974	-0.0493	-0.325	0.672	No ARCH	No	No	4	
Sao Tome and Prince	22	-0.0443	-0.0443	-0.2194	0.437*	0.500	No ARCH	No	No	1	
Saudi Arabia	17	-2.5850	-5.6631	3.1314	-0.678	0.919	No ARCH	No	No	4	
Senegal	25	0.0174	0.0174	-0.0424	-0.554**	0.395	No ARCH	No	Yes	1	
Seychelles	21	1.1004	-10.5651	2.9896	-1.128**	0.774	No ARCH	Yes	Yes	4	
Sierra Le- one	21	-0.2666	-0.3227	0.1270	0.561	0.774	No ARCH	No	No	4	
South Af- rica	26	-0.3888	-0.3888	-12.2103**	-0.285**	0.446	No ARCH	Yes	No	1	
Tanzania	23	-0.0327	-0.0327	0.1074	-0.111	0.134	No ARCH	No	No	1	

Country	N	Short-run Effects			Long-run	ECT	R ²	Diagnostic Tests			Lags
		Contem- poraneous	Total					ARCH	Bounds	Ba- nerjee	
Togo	28	-0.0135	-0.0025	0.0445**	-1.352***	0.765	No ARCH	Yes	Yes	4	
Tunisia	25	0.9620***	0.9620	2.1135***	-0.468***	0.615	No ARCH	Yes	Yes	1	
Uganda	16	0.5123**	0.5123	0.0995	-2.050**	0.794	No ARCH	Yes	No	1	

Table 9. ARDL Results.

Notes: ***, **, * denote significance at 1%, 5%, and 10% levels, respectively. ECT = Error Correction Term. ARCH = Autoregressive Conditional Heteroskedasticity test (No ARCH means homoskedastic residuals). Bounds and Banerjee tests for cointegration (Yes = cointegration detected). Lags = number of short-run lags selected by the model.

Country	N	Short-run Effects		Long-run Effects		Asym- metry	ECT	R ²	Asymme- try Tests		Diagnos- tic Tests		Terms (P,N)
		Positive	Negative	Positive	Negative				LR	SR	ARCH	Pesa- ran	
Benin	26	-0.0644	0.0705	-0.0898	-0.0613	-0.0285	-0.695**	0.707	No	No	No ARCH	Yes	(2,1)
Burundi	27	0.0374*	0.0757***	0.0432***	0.0901***	-0.0469	-1.937***	0.900	Yes	Yes	No ARCH	Yes	(1,4)
Cabo Verde	22	0.8086	-2.6821**	-0.2138	-0.0283	-0.1855	-2.718**	0.991	Yes	Yes	No ARCH	Yes	(4,4)
Came- roon	23	0.1091	0.0236	-0.0413	0.1048*	-0.1461	-2.114***	0.819	Yes	Yes	No ARCH	Yes	(1,4)
Central African Republic	26	-0.2205*	0.1134	-0.4201**	-0.2694**	-0.1507	-1.375***	0.915	Yes	Yes	No ARCH	Yes	(4,4)
Cote d'Ivoire	27	1.4965**	-0.0241	-2.3862*	-0.9768	-1.4094	0.358	0.779	No	No	No ARCH	No	(4,2)
Eswatini	29	0.5216	0.2817	1.2406	1.0458	0.1948	-0.454**	0.332	No	No	No ARCH	No	(1,1)
Ethiopia	23	0.1790**	-0.2097	0.0005	-0.4548***	0.4554	-1.796***	0.955	Yes	No	No ARCH	Yes	(4,3)

Country	N	Short-run Effects		Long-run Effects		Asymmetry	ECT	R ²	Asymmetry Tests		Diagnostic Tests		Terms (P,N)
		Positive	Negative	Positive	Negative				LR	SR	ARCH	Pesaran	
Gambia, The	24	0.0038	-0.2754	1.6522*	2.2597*	-0.6075	0.241	0.879	No	No	ARCH	No	(4,2)
Ghana	23	0.1612	-0.3966*	0.4636***	0.0232	0.4404	-1.304***	0.936	Yes	No	No ARCH	Yes	(2,4)
Guinea	26	-0.0049	0.3219*	2.4357*	1.3559	1.0798	-0.177	0.910	No	No	No ARCH	Yes	(4,4)
Iran, Islamic Rep.	28	-6.9015***	-1.5076	-41.0725***	-30.4892**	-10.5834	-0.134	0.789	No	Yes	No ARCH	Yes	(2,4)
Israel	23	-2.3317	-8.4774	18.8610**	-37.1161	55.9771	-1.367**	0.890	No	No	No ARCH	Yes	(3,4)
Lesotho	28	0.6817***	0.0054	-0.0761	0.1447	-0.2208	0.789**	0.857	Yes	Yes	No ARCH	Yes	(4,3)
Madagascar	23	-0.0247	0.0340	0.0246	0.0594	-0.0348	-1.201***	0.680	Yes	No	No ARCH	No	(3,1)
Mali	22	-0.7656***	0.0291	1.6467***	1.1880***	0.4587	0.556*	0.979	Yes	No	No ARCH	Yes	(4,4)
Malta	27	12.6060*	-15.5626**	33.2388**	12.4325	20.8063	-0.362	0.760	Yes	No	No ARCH	No	(3,2)
Mauritius	21	2.1711	-0.6927	11.2777	5.5935	5.6841	-3.193	0.941	Yes	No	No ARCH	No	(4,3)
Niger	24	0.0652*	0.0982*	-1.0812	-0.6381	-0.4431	-0.076	0.970	No	Yes	No ARCH	Yes	(4,3)
Oman	23	-12.1864***	21.6310	171.6519**	261.4617*	-89.8097	-0.121	0.871	No	Yes	No ARCH	No	(3,1)
Sao Tome and Principe	22	1.3167	-1.8391	0.9372	1.0134	-0.0763	1.518	0.915	No	No	No ARCH	No	(4,4)
Senegal	25	-0.1975	0.0224	0.7811*	0.7047	0.0765	0.290	0.833	No	Yes	No ARCH	Yes	(4,2)
Seychelles	21	6.1376*	-0.1254	-1.1671	-3.2043	2.0372	-0.788**	0.998	Yes	Yes	No ARCH	Yes	(4,4)
Sierra Leone	21	-0.7210**	-0.7911**	0.2079***	0.3399***	-0.1320	1.612	0.998	No	Yes	No ARCH	Yes	(3,4)

Country	N	Short-run Effects		Long-run Effects		Asymmetry	ECT	R ²	Asymmetry Tests		Diagnostic Tests		Terms (P,N)
		Positive	Negative	Positive	Negative				LR	SR	ARCH	Pesaran	
South Africa	26	-0.2176	-0.0659	-10.5535*	-9.8667	-0.6868	-0.310**	0.460	No	No	No ARCH	No	(1,1)
Tanzania	23	-0.2001	0.3249	-7.9186	-8.0466	0.1281	0.032	0.809	No	Yes	No ARCH	No	(4,3)
Togo	28	0.0080	0.0069	0.0241	0.0398**	-0.0156	-2.030***	0.844	Yes	No	No ARCH	Yes	(3,2)
Tunisia	25	0.7337	0.8957**	1.6665	1.7078	-0.0412	-0.566*	0.829	No	No	No ARCH	No	(3,3)

Table 10. NARDL Results.

Notes: ***, **, * denote significance at 1%, 5%, and 10% levels, respectively. ECT = Error Correction Term. Asymmetry = LR_Positive - LR_Negative. LR/SR = Long-run/Short-run asymmetry tests (Yes = asymmetry detected). ARCH = Autoregressive Conditional Heteroskedasticity test. Pesaran = Pesaran F-test for cointegration. Terms (P,N) = number of positive and negative lag terms.

Conclusion

This study has examined the education spending paradox through comprehensive analysis of 164 countries over 1988-2023, with particular focus on 38 Mena and African economies using advanced time-series econometric techniques. Our findings reveal a complex relationship between education investment and economic productivity that challenges simplistic policy prescriptions while offering nuanced insights for development strategies.

The persistent negative correlation between education spending as a percentage of government expenditure and contemporaneous productivity levels, observed consistently across three decades, confirms the existence of a genuine economic trade-off. This relationship persists across different global economic conditions, suggesting it reflects fundamental economic mechanisms rather than statistical artifacts. The construction of our productivity measure (*verim*), which eliminates global shocks by design, strengthens confidence that these patterns reflect country-specific dynamics.

Our application of ARDL and NARDL methodologies to Mena and African countries reveals substantial heterogeneity beneath the aggregate patterns. While short-run effects are predominantly negative –confirming immediate productivity costs from education expansion– long-run outcomes vary dramatically across countries. The stark differences between symmetric (ARDL) and asymmetric (NARDL) specifications highlight that the direction of education spending changes matters as much as their magnitude. Countries like Ghana and Burundi show markedly different responses to spending increases versus decreases, suggesting that linear models miss crucial policy-relevant dynamics.

The prevalence of error correction terms exceeding unity in absolute value, particularly in the NARDL specifications, indicates that Mena and African economies experience oscillatory rather than monotonic adjustment to education policy changes. These rapid, overshooting dynamics likely reflect the volatile implementation environment in developing countries, where education reforms can trigger swift resource reallocations that temporarily destabilize productivity before reaching new equilibria.

Several key policy implications emerge from our analysis. First, plan for short-term productivity costs when expanding education investments, implementing complementary measures to maintain economic output during transition periods. Second, the asymmetric effects revealed by NARDL models suggest that gradual,

sustained education investments may yield better outcomes than volatile spending patterns. Third, the heterogeneity across Mena and African countries implies that optimal education strategies must account for country-specific economic structures, institutional quality, and existing human capital stocks.

Our findings contribute to reconciling conflicting evidence in the education-growth literature. The education spending paradox reflects neither measurement error nor theoretical inconsistency, but rather the complex temporal dynamics of human capital formation. Education investments impose real opportunity costs by diverting resources from immediately productive uses and temporarily reducing labor force participation. Whether these costs translate into long-term productivity gains depends critically on implementation quality, complementary institutions, and country-specific absorption capacity.

Future research should extend this analysis by incorporating education quality measures as data availability improves, examining specific spending categories to identify highest-return investments, and exploiting natural experiments from education reforms for cleaner causal identification. The development of theoretical models that explicitly incorporate overshooting dynamics and asymmetric adjustment mechanisms would further advance our understanding of education-productivity relationships in developing countries.

In conclusion, while education remains crucial for long-term development, our results emphasize that investment strategies must be carefully calibrated to country contexts. The path from education spending to productivity enhancement is neither linear nor universal, requiring policymakers to balance immediate economic needs with long-term human capital formation. For Mena and African countries seeking to escape low-productivity traps, understanding these complex dynamics is essential for designing effective, sustainable education policies that maximize development impact while managing transition costs.

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ISTANBUL CONFERENCE ON ECONOMICS AND SOCIETY (ISTCES) 2025

*Pathways to Inclusive Growth: Overcoming Challenges in
Emerging and Developing African Countries.*

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Book of Proceedings

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These proceedings compile papers presented at the Istanbul Conference on Economics and Society (ISTCES) 2025, held under the theme "Pathways to Inclusive Growth: Overcoming Challenges in Emerging and Developing African Countries." Held at Ibn Haldun University from September 24-26, 2025, the conference examined key issues related to economic growth, inclusiveness, institutional structures, inequality, and sustainable development, with a primary focus on African economies. The contributions included in this volume engage with current debates in economics and the social sciences through a variety of country cases and analytical approaches.

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