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RESEARCH ARTICLE

Analysis of the Effects of Urbanisation on Economic Diversification in Africa

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ABSTRACT

The objective of this study is to analyse the effect of urbanisation on economic diversification in Africa. The methodology used to achieve this objective is based on the approach developed by Driscoll and Kraay (1998), the Generalised Least Squares (GLS) method and the Systematic Two-Stage Generalised Method of Moments (SGMM). The data used in this study are all drawn from the World Bank's *World Development Indicators* (WDI) and *World Governance Indicators* (WGI) databases, as well as the COMTRADE database of the United Nations Conference on Trade and Development (UNCTAD). This study covers a sample of 53 African countries over the period from 2000 to 2022. Economic diversification is measured in this study using the Herfindahl-Hirschman Index (HHI). The results of this study show that urbanisation has a negative and statistically significant effect on economic diversification in Africa. This finding indicates that rapid urban growth reduces economic diversification. Furthermore, the results of this study show that institutional variables — such as the rule of law, regulatory quality, political stability and government effectiveness — are the channels through which urbanisation influences economic diversification in Africa. Moreover, our results hold up when using an alternative measure of economic diversification, namely the Theil Index. The findings of this study indicate that public authorities must implement strategic urban planning to support productive sectors. This will encourage better-planned urbanisation by integrating industrial, technological and artisanal zones into cities to foster the development of diversified economic sectors.

Keywords: Urbanisation, Economic diversification, Institutions, Panel data, Africa

1.0 Introduction

Africa is undergoing rapid urbanisation. According to the report *Africa's Urbanisation Dynamics 2025*, Africa's urban population is projected to double by 2050, rising from approximately 700 million to 1.4 billion people (Organization for Economic Cooperation and Development [OECD], 2025). This population growth is accompanied by the spatial expansion of urban agglomerations, both in cities and coastal areas as well as in inland regions (OECD, 2025). According to the OECD's *Africa's Urbanisation Dynamics 2022* report, nearly 30% of per capita GDP growth in Africa over the past two decades is attributable to urbanisation (OECD, 2022). Urbanisation generates agglomeration economies: proximity, density, infrastructure and transportation networks that stimulate innovation and specialisation while reducing transaction costs. However, this large-scale urbanisation poses challenges: urban sprawl,

public services, pressure on infrastructure and housing, and environmental risks (OECD, 2025), for instance. Furthermore, not all African countries are progressing at the same pace, as some countries still have low urbanisation rates, a situation which hinders their ability to absorb rural migration flows (Ren et al., 2025). At the same time, urban infrastructure — such as energy, transportation, and connectivity — is often insufficient to support high-quality growth (El-Bouayady et al., 2024). In cities, the level of human development tends to be higher than in rural areas: city dwellers have greater access to educational and health services as well as skilled jobs (OECD, 2022). However, this progress is not uniform and unplanned urbanisation can exacerbate disparities, fuel the expansion of slums and increase socio-economic vulnerabilities (Bettencourt et Marchio, 2023).

Economic diversification is defined as the gradual transition from an economy dependent on a few sectors (typically agriculture and natural resources) to a more varied structure that includes industry, services, technology, etc. This process is essential for reducing vulnerability to external shocks (commodity prices, climate fluctuations, global markets). In Africa, many countries are striving to diversify in order to stimulate industrialisation, promote SMEs and develop sectors with higher value added. The African Union, the African Continental Free Trade Area (AfCFTA) and various national industrialisation strategies emphasise local processing, non-primary exports and digital services. However, challenges remain: inadequate infrastructure, a limited labour force, access to financing, institutional barriers and, in some cases, the dominance of a large informal sector. According to the study by Dadi et al. (2022), conducted in the Adama district of Ethiopia, urbanisation is prompting agricultural households to diversify into non-agricultural sectors, highlighting one of the processes of diversification.

Urbanisation is often regarded as a driver of economic diversification. In many developing countries, urbanisation is recognised as a clear catalyst for economic diversification owing to its impact on industrial expansion, productivity and the labour market. According to a study conducted by Celik et al. (2024) on six African countries between 1991 and 2019, the rate of urbanization, combined with trade liberalization, plays an important role in economic growth, productivity, and employment, thereby promoting the diversification of economic activities beyond the primary sector. Furthermore, the report *"Leveraging Urbanisation for Africa's Structural Transformation"*, undertaken by the Economic Commission for Africa (ECA), notes that urbanisation, if properly managed, generates agglomeration effects and productivity gains crucial for structural transformation and also includes the development of diversified industrial sectors (ECA, 2017). According to research conducted by Zhang et al. (2023) in China, new urbanisation drives high-quality economic growth through innovation, consumption and investment, which is a sign of diversification in factors of production and economic sectors. Similarly, planned urbanisation policies in Chad are seen as essential not only for industrialisation but also for economic diversification, provided that infrastructure, energy, skills and an appropriate regulatory framework are in place (ECA, 2021). Urbanisation does more than simply increase population density; when properly guided, it can expand non-agricultural activities, diversify jobs and sources of income and strengthen regional economic resilience in the face of external shocks.

Urbanisation is now a major phenomenon shaping development trajectories, with a growing concentration of populations and economic activities in cities, thereby fostering productive specialisation (Cobbinah et al., 2015). In this context, several recent studies show that urbanisation can stimulate economic diversification by facilitating innovation, the dissemination of knowledge and the structural transformation of economies, particularly in developing countries (Di Clemente et al., 2021). However, this relationship is not automatic, as it depends heavily on the quality of institutions, public policies and governance capacities that shape urban development (Meyer et Auriacombe, 2019). The literature also reports that financial institutions, financial inclusion and public policies play a decisive role in channeling the effects of urbanisation toward more diversified and sustainable growth (Rizwanullah et al., 2024; Ouedraogo et Thiombiano, 2025). Furthermore, in African economies, rapid urbanisation has not always led to significant productive diversification owing to institutional weaknesses and persistent structural constraints (Celik et al., 2024).

Rapid urbanisation in Africa has sparked a key debate regarding its role in the continent's economic

diversification — that is, the transition from an economy heavily dependent on raw materials to more diversified sectors such as manufacturing, modern services and innovation. This urban growth is likely to boost productivity, skilled employment and access to services — elements crucial for diversifying the economy beyond primary sectors (OECD, 2022). According to Mbongo et al. (2025), urbanisation is strongly correlated with structural change in 53 African countries over the 2010 to 2020 period. However, it is noted that this link is weaker in countries with abundant natural resources where the economy remains undiversified. Many African cities struggle to convert the advantage of rapid urbanisation into effective diversification owing to inadequate infrastructure, weak urban governance and limited financial resources. Furthermore, urban growth gives rise to significant challenges — informality, urban poverty, inadequate infrastructure and overburdened public services — which can hinder a city's ability to foster effective diversification (Fadda, 2024). Furthermore, Sakketa's (2023) research indicates that urbanisation is likely to lead to spatial imbalances and the loss of agricultural land, as well as pressure on resources, thereby threatening rural value chains linked to agriculture or agribusiness. In a context where rapid urbanisation in Africa is often seen as a driver of structural transformation, it can paradoxically exacerbate the concentration of economic activities in undiversified sectors, particularly the informal sector and low-value-added services. Owing to urban demographic pressure, inadequate infrastructure and limited planning, cities struggle to support the emergence of productive and innovative industries capable of supporting genuine economic diversification. In light of the above, the following research questions arise: What is the effect of urbanisation on economic diversification in Africa? What are the mechanisms through which urbanisation influences economic diversification?

Thus, the objective of this research is twofold: to analyse the effect of urbanisation on economic diversification and to identify the mechanisms through which urbanisation influences economic diversification. Studying the effect of urbanisation on economic diversification in Africa is important because it helps us better understand how urban transformation can stimulate growth through structural shifts in economies (toward industrial and service sectors, etc.), reduce dependence on revenue from raw materials and promote resilience in the face of external shocks. This research can also shed light on how urban planning policies can be directed to optimise economic diversification (Ahimah-Agyakwah et al., 2022). Furthermore, urban growth has spillover effects for rural areas (through demand, logistics and markets), which can encourage a more balanced diversification of the national productive fabric. By identifying the conditions under which urbanisation promotes this transition, this research can guide public policies toward more inclusive and sustainable growth. It thus helps inform decisions regarding land-use planning, investments in urban infrastructure and human capital development.

The results of this study show that urbanisation has a negative and statistically significant effect on economic diversification. Furthermore, institutional variables such as the rule of law, regulatory quality, political stability and government effectiveness are the channels through which urbanisation influences economic diversification.

The remainder of this paper is organised as follows. Section 2 presents a brief literature review, and Section 3 describes the data, the measurement of variables and the empirical methodology. Section 4 discusses the results obtained. The final section presents the conclusion.

1.0 Literature Review

1.1 Review of the Theoretical Literature

The theoretical literature on the effects of urbanisation on economic diversification highlights the central role of agglomeration economies in the structural transformation of economies, particularly through the seminal work of Jacobs (1969), who noted that urban concentration promotes a variety of activities and innovation. From this perspective, relying on new economic geography, Krugman (1991) demonstrates that the spatial concentration of activities reduces transaction costs and stimulates specialisation and sectoral diversification. Furthermore, Marshall (1890) highlights the positive externalities associated with geographic proximity, particularly knowledge sharing and the formation of a specialised labour market. These ideas are shared by Glaeser et al. (1992), who distinguish between specialisation and diversity externalities as complementary drivers of urban growth. Similarly, Lucas (1988) stressed the role of

human capital concentrated in cities as a key factor in economic diversification. Models of structural transitions (Lewis, 1954; Kuznets, 1973) show that urbanisation accompanies the shift of economic activities from the agricultural sector toward industry and services. From a neo-institutional perspective, North (1990) observed that urbanisation is accompanied by an institutional framework that is conducive to the emergence of new economic activities. In their own work, Porter (1998) developed the Clusters Theory, according to which the concentration of interconnected firms promotes innovation and industrial diversification. However, some authors, such as Henderson (2003), warn against agglomeration diseconomies — including traffic congestion, pollution, and overpopulation — which can hinder diversification.

The theoretical literature on urbanisation and economic diversification aligns with the institutional approach pioneered by North (1990), which posits that cities, as hubs of economic activity, amplify economic interactions but require formal rules to structure these exchanges. In this context, the rule of law emerges as a central channel, as the protection of property rights and the enforcement of contracts enable investment and the emergence of new productive activities — conditions that are, moreover, essential for diversification. The quality of regulation, by improving the business environment and reducing transaction costs in urban areas, facilitates the entry of new firms and the structural transformation of economies (Kaufmann et al., 2011). Political stability is also a key channel, as it reduces uncertainty, stabilises agents' expectations and enables capital accumulation as well as the development of diversified markets (Aisen et Veiga, 2013). Similarly, government effectiveness — by ensuring the quality of public services and the consistent implementation of urban policies — boosts productivity and supports innovation, both of which are key drivers of economic diversification (Hall et Jones, 1999; Rodrik et al., 2004). Thus, the literature converges on the idea that urbanisation influences economic diversification only indirectly, through institutional variables that shape the economic environment and determine the productive transformation of economies.

Figure 1 below illustrates how urbanisation influences economic diversification and the channels (rule of law, regulatory quality, political stability and government effectiveness) through which urbanisation affects economic diversification.

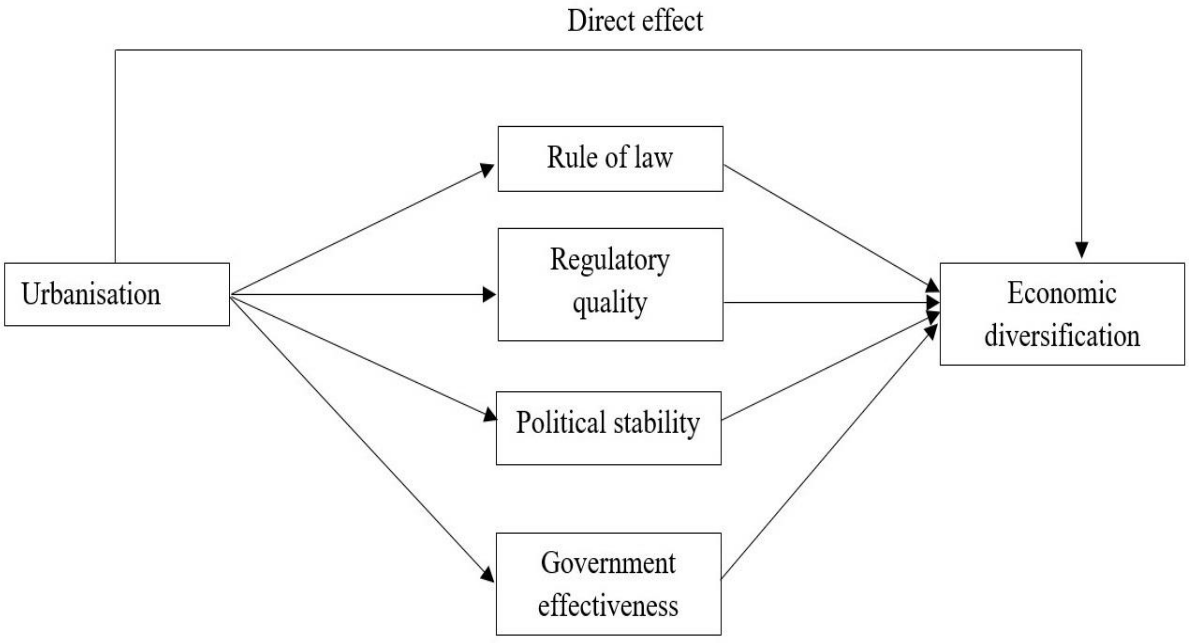


Figure 1: Urbanisation and economic diversification – the theoretical links economy

Source: Authors' construct

1.2 Review of the Empirical Literature

Numerous studies in the existing literature show that urbanisation can promote economic diversification but often in sectors with low productivity. In the case of Nigeria, for example, the work of Folawewo (2024) uses quantitative and qualitative analysis techniques applied to data from primary and secondary sources to show that while urbanisation is accompanied by a shift away from agriculture, the majority of jobs created are in low-value-added informal services, with limited penetration into the industrial sector. On the other hand, the study by Sahasranaman et al. (2024) on India shows that urban growth is associated with improvements in several human development indicators, suggesting a "multidimensional" diversification effect beyond income. In China, Hovhannisyan and Asci (2024) use quantile regression and find that urbanisation stimulates growth up to a certain threshold, beyond which marginal returns decline. The study by Zhong et al. (2023) also examines the interaction between urbanisation, internet development and regional growth and shows that urbanisation facilitates growth in technology- and service-related sectors through digital infrastructure.

Other recent studies in the literature show that, in the early stages of development, urbanisation is strongly correlated with increased economic complexity (diversity of exported products, ability to produce goods with higher value added). For example, Di Clemente et al. (2021) found that for many developing countries over the period 1995–2010, urbanisation was accompanied by more diversified exports and integration into more complex value chains. This export diversity is low in countries highly dependent on commodities, where urbanisation does not necessarily accompany structural transformation. Similarly, the study by Celik et al. (2024), which focuses on six African countries, shows that urbanisation combined with trade openness stimulates not only growth but also, and above all, productivity and employment, which underpins economic transformation. Furthermore, in the Indian context, Shaban et al. (2022) found that, at the state level, economic growth often drives urbanisation more than the reverse, indicating an imbalance in the drivers of diversification.

1.3 Transmission Mechanisms

The literature shows that urbanisation is a key driver of economic diversification, particularly through improved institutional quality and an accelerated structural shift toward higher-value-added sectors such as services and manufacturing. The work of Di Clemente et al. (2021), for example, shows that urbanisation is strongly correlated with changes in export structure and economic complexity during the early stages of development. However, this effect is not automatic, as the quality of institutions (measured by indicators such as government effectiveness, control of corruption and the rule of law) significantly moderates how urbanisation translates into diversification (institutional instability or corruption increases the risk of concentration in a few sectors). Nguyen and Nguyen (2018) show that the quality of institutions and infrastructure plays a moderating role: weak institutions or inadequate infrastructure can limit cities' ability to diversify effectively. Similarly, the work of Ademola et al. (2021) in Nigeria shows that institutions that function effectively (quality of services and regulatory reliability) increase the rate of diversification of non-oil exports, in both the short and long terms.

In China, the study by Zhang et al. (2023) on "new urbanisation" shows that urbanisation stimulates innovation and consumption but that regions where institutions promote investment in human capital or infrastructure see a more pronounced effect on structural transformation. Furthermore, research on urban economic resilience by Zhang et al. (2021) shows that industrially diversified urban areas are better able to withstand shocks, implying that urban sectoral diversification (facilitated by institutions capable of encouraging competition, protecting property rights and regulating effectively) is important. Toufique (2024) also found that urbanisation positively impacts the quality of institutions in Bangladesh, suggesting that there may be a reverse pathway where urbanisation improves institutions, which in turn promote economic diversification.

All these studies converge on the idea that urbanisation alone — in this case, population growth and urban agglomeration — is not enough:

without effective institutions, diversification remains limited or even ineffective.

2.0 Methodological Approach

2.1Data

The data used in this study come from various sources, including the World Bank's *World Development Indicators* (WDI) database and the United Nations Conference on Trade and Development (UNCTAD) database. The study period for this research spans from 2000 to 2022 for a sample of 53 African countries[1]. While Africa comprises 54 countries, we excluded South Sudan from our sample for lack of data for the period in question. The panel for this study is balanced. The variables used to conduct this study include urbanisation, economic diversification, education, industrialisation, GDP per capita and total natural resource rent. The choice of variables for this study is based on data availability and their relevance to the existing literature.

The Dependent Variable: Economic Diversification

Economic diversification is measured in this study using the Herfindahl-Hirschman Index. The data for this measure of economic diversification was drawn from UNCTAD's Comtrade database. Regarding the export diversification index, several indices are identified in the empirical literature: the Herfindahl-Hirschman Index (HHI), the Theil Entropy Index, the Gini Index, and the Ogive Index (Cadot et al., 2011, 2013; Djimeu and Omgba, 2019). Unlike concentration indices such as the HHI, diversification indices illustrate the number of products in a nation's export basket and the distribution of their respective shares. The Theil Index is a clear example. However, according to Tran et al. (2017), in general, export concentration indices yield rankings quite similar to those of diversification indices and can therefore be used interchangeably. For example, the studies by Agosin et al. (2012) and Avom et al. (2020) use these indices in turn as robustness checks in their respective studies, yielding fairly similar results. In this research, we use the HHI in the main specification.

For the robustness analysis, we refer to the work of Malah et al. (2025) and use the Theil Index to verify the reliability of the results obtained using the HHI.

It is important to note that the HHI ranges from 0 to 1. A value of 1 indicates a highly concentrated export structure (i.e., less diversified) and vice versa. The HHI is calculated as follows:

$$HHI_j = \frac{\sqrt{\sum_{i-1}^{n}\left(\frac{x_i}{X}\right)^2} - \sqrt{\left(\frac{1}{n}\right)}}{1-\sqrt{1/n}} \qquad (1)$$

Where HHI_j represents the country index $j.$, x_i represents the value of the product's exports, $i.\ X = \sum_i^n x_i$ and n represents the number of product groups according to the Standard International Trade Classification (SITC), Revision 3.

The Independent Variable of Interest: Urbanisation

The primary measure used is the urbanisation rate. To measure the urbanisation rate in this study, we use the share of the urban population (as a percentage of the total population). This indicator is calculated using demographic estimates from the World Bank and urban ratios from the United Nations World Urbanisation Prospects. The urban percentages correspond to the number of people living in an area defined as "urban" per 100 inhabitants.

Figure 2 below represents the evolution of the urban population growth rate and the growth rate of the level of urbanisation in Africa by period, i.e., 1950-2015.

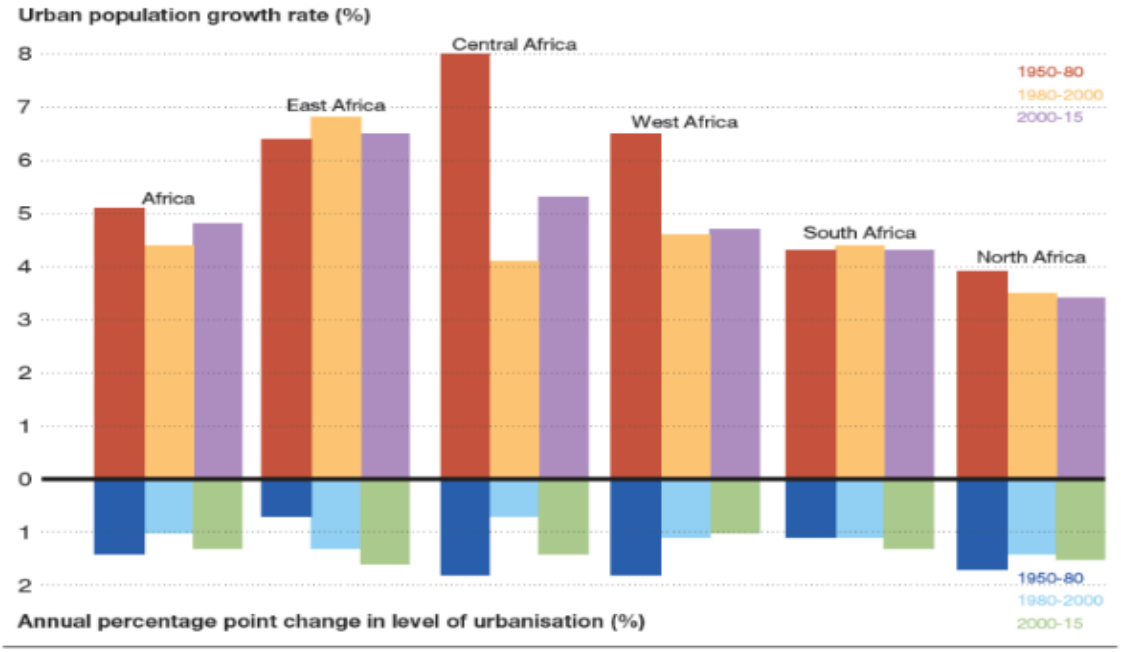


Figure 2: Urban population growth and growth in the level of urbanisation in Africa by period, 1950 to 2015
Source: OECD (2018)

Control Variables

The control variables are education, industrialisation, GDP per capita and total natural resource rent.

Education: The gross enrolment rate is the ratio of the total number of enrolled students, of all ages, to the population of the age group officially corresponding to the specified level of education (World Bank, 2023). We use the level of education in this study in accordance with the work of Gnangnon (2022). In line with work by Gui-Diby and Renard (2015), Njangang and Nounamo (2020) and Djeunankan et al. (2024), industrialisation is measured in this study by the percentage of manufacturing value added (MVA) in GDP (as a percentage of GDP). This variable measures the difference between total output and intermediate consumption, expressed in terms of the manufacturing sector's contribution to GDP. GDP per capita corresponds to gross domestic product divided by the mid-year population (World Bank, 2023). GDP at purchaser prices is the sum of the gross value added of all resident producers in the economy, plus taxes on products and minus subsidies not included in the value of products (World Bank, 2023). We use GDP per capita in reference to the work of Gnangnon (2022), Pereira and de Menezes (2021) and Malah-Kuete et al. (2025). Per capita GDP has been scaled. This variable was scaled to reduce its range, which was too wide compared to that of the other variables. Total natural resource rent (% of GDP) (TNR) is the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents and forest rents (World Bank, 2023). This measure is widely used in studies on the resource curse (Ebeke et Etoundi, 2017; Stretesky et al., 2017; Tadadjeu et al., 2020; Totouom, 2023; Totouom et al., 2024). In this study, we expect education and industrialisation to be negatively correlated with the HHI (promoting diversification) and natural resource rents to be positively correlated with the HHI (promoting concentration).

Table 1 below presents the descriptive statistics for the different variables in this study. The data on the study variables come from the WDI and UNCTAD. Table 1 below shows that the average economic diversification rate (HHI) in Africa is 0.769%, with a standard deviation of approximately 0.081%, a minimum of 0.49 and a maximum of 0.938. In contrast, the average urbanisation rate is 43.115% with a standard deviation of approximately 17.874%, a minimum of 8.246 and a maximum of 90.735. These statistics clearly demonstrate that the average rate of economic diversification in Africa still needs to be improved. Furthermore, an average HHI index of 0.769 for African countries confirms a high concentration of exports.

Table 1: Descriptive statistics of the study variables

Variables	Obs	Mean	Std. Dev.	Min	Max
HHI	1219	.769	.081	.49	.938
Urbanisation	1219	43.115	17.874	8.246	90.735
Education	728	46.517	23.945	5.46	111.802
Industrialisation	1043	10.695	5.933	.233	44.98
GDP (ln)	1195	7.226	.987	5.542	9.877
TNR	1138	11.556	11.703	.002	88.592

Source: Compiled by authors from the WDI and UNCTAD databases

Figure 3 below shows the correlations between urbanisation and economic diversification. The scatter plot and the regression line suggest that the urbanisation rate is negatively correlated with the Herfindahl-Hirschman Index. Furthermore, the cross-correlation matrix presented in Table 2 below confirms the existence of a negative correlation between these variables. Based on this initial evidence, we explore the relationship between these variables in depth in the following section, using appropriate econometric estimates.

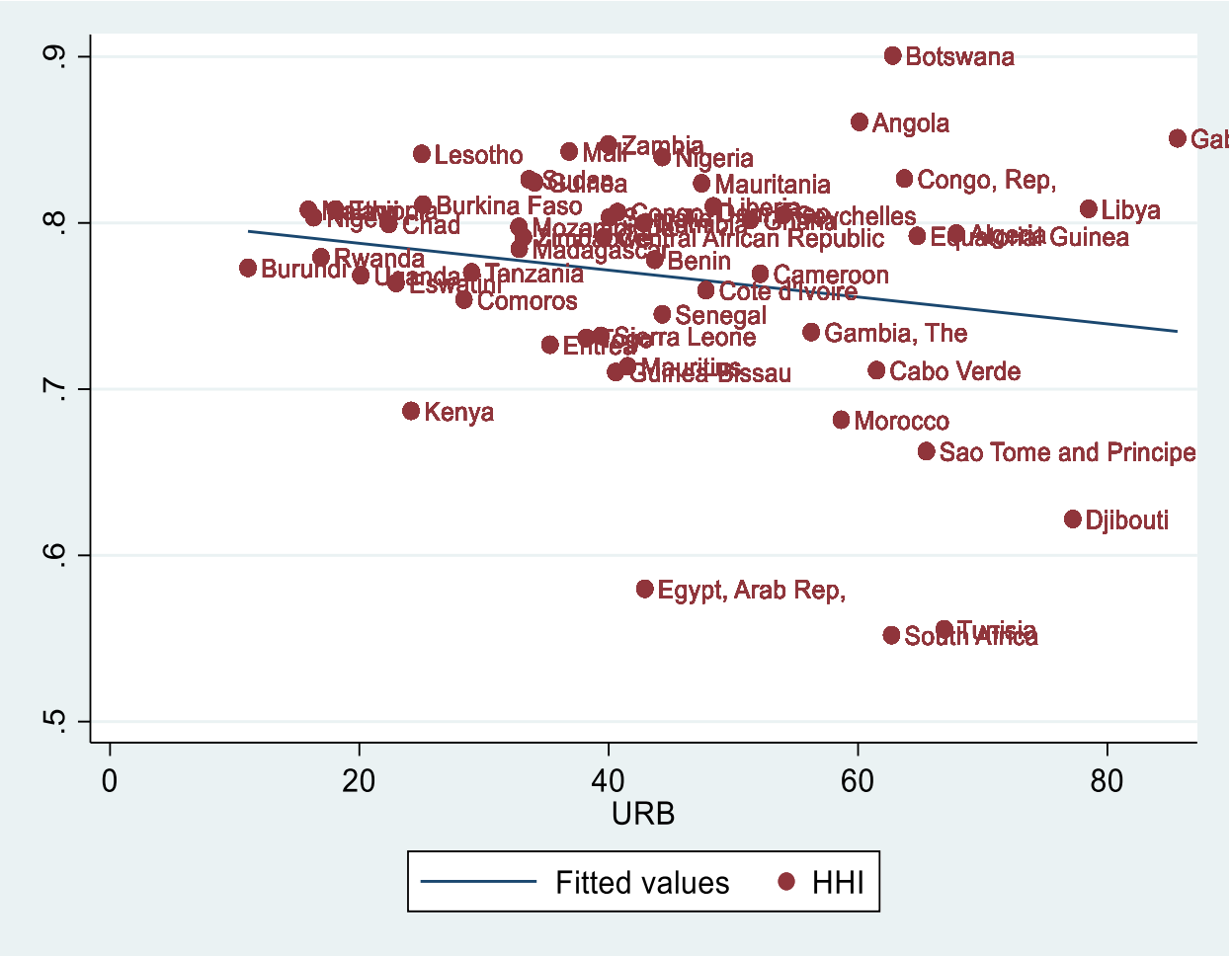


Figure 3: Scatter Plot

Note: URB = Urbanisation; HHI=Herfindhahl-Hirschman Index

Source: Authors' construct based on data from WDI and UNCTAD

Table 2: Cross-correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) HHI	1.000					
(2) Urbanisation	-0.147	1.000				
(3) Education	-0.392	0.562	1.000			
(4) Industrialisat	-0.154	-0.106	0.150	1.000		
(5) GDP (ln)	-0.130	0.687	0.779	0.148	1.000	
(6) TNR	0.254	0.245	-0.146	-0.233	0.105	1.000

Source: Compiled by authors from the WDI and UNCTAD databases

3.2 Model and Estimation Strategy

3.2.1 Empirical Model

The empirical model used in this study is based on the work of Malah-Kuete et al. (2025). For this study we specify the empirical model as follows:

$$HHI_{it} = \alpha_0 + \alpha_1 URB_{it} + \alpha_2 Educ_{it} + \alpha_3 Indus_{it} + \alpha_4 lnGDP_{it} + \alpha_5 TNR_{it} + \varepsilon_{it} \quad (2)$$

Where HHI represents the Herfindhahl-Hirschman Index, URB represents urbanisation, $Educ$ represents education, $Indus$ represents industrialisation, GDP represents GDP per capita and TNR represents the total rent from natural resources, while ε_{it} is the error term.

With regard to the transmission channels in this study, the new model is presented as follows:

$$HHI_{it} = \alpha_0 + \alpha_1 URB_{it} + \alpha_2 Educ_{it} + \alpha_3 Indus_{it} + \alpha_4 lnGDP_{it} + \alpha_5 TNR_{it} + \alpha_6 RL_{it} + \alpha_7 URB \times RL_{it} + \alpha_8 RQ_{it} + \alpha_9 URB \times RQ_{it} + \alpha_{10} PS_{it} + \alpha_{11} URB \times PS_{it} + \alpha_{12} GE_{it} + \alpha_{13} URB \times GE_{it} + \varepsilon_{it} \quad (3)$$

where RL represents Rule of Law, RQ represents Regulation Quality, PS represents Political Stability and GE represents the Government Effectiveness.

3.2.2 Estimation Strategy

The Driscoll-Kraay method and the Generalised Least Squares (GLS) method are used as the estimation strategies. Given the inherent dependencies in panel data, the estimation technique developed by Driscoll and Kraay (1998) is employed. This estimation technique allows us to address issues of dependence among variables (Driscoll & Kraay, 1998). To verify the stability of these estimates, we will use the GLS method. It should be noted that the GLS technique offers numerous advantages over the ordinary least squares (OLS) method, as it allows for better handling of heteroscedasticity and autocorrelation, leading to more accurate and efficient estimators. The combined use of the Driscoll-Kraay and Generalised Least Squares techniques is justified by the need to simultaneously correct for various forms of dependence and heterogeneity present in the panel data. While the GLS technique addresses heteroscedasticity and autocorrelation specific to individuals, the Driscoll-Kraay method effectively corrects standard errors in the presence of cross-unit dependence. Thus, their combination ensures robust estimates and reliable inferences, particularly suitable for panels spanning a large number of time periods. However, these initial estimation techniques do not address the endogeneity issue that we may encounter in this study.

To address any endogeneity issues that may arise in this research, we use the System Generalised Method of Moments (SGMM) to address this problem. The System GMM method is used for robust analysis. Several reasons motivate the choice of this estimation technique. First, it has the advantage of addressing simultaneity bias (through the instrumental variables process) that may arise from the presence of endogenous explanatory variables. Second, it allows for the estimation of unbiased, convergent and efficient estimators in the presence of lagged variables. Third, it accounts for geographical and cultural factors such as access to the sea and ethnolinguistic diversity. Furthermore, given the panel characteristics of the data used, SGMM is more appropriate and consistent than

ordinary least squares (OLS) or fixed effects (Blundell & Bond, 1998).

The GMM estimator comes in two forms: the difference GMM and the system GMM (SGMM). Proposed by Arellano and Bond (1991), the difference GMM involves estimating the model equation using first differences to control for the effect specific to the statistical unit. However, the problem with this estimator is that it suffers from instrument weakness (Blundell & Bond, 1998). To overcome this problem and increase the efficiency of our estimates, we apply the two-stage system GMM proposed by Arellano and Bover (1995) and Blundell and Bond (1998).[2] SGMMs involve simultaneously estimating the first-difference equation and the level equation. The instruments for the first-difference regression are the lagged endogenous explanatory variables, while the instruments for the level regression are the lagged first-difference endogenous explanatory variables.[3] Blundell and Bond (1998) demonstrate that SGMMs produce more efficient estimates than difference GMMs. Although the GMM system resolves the above issues, it has a weakness. Indeed, although asymptotically more efficient, the two-stage GMM produces standard error estimates that tend to be significantly biased downward. However, this problem can be overcome by using the finite-sample correction developed by Windmeijer (2005). Furthermore, it is important to note that the GMM system may suffer from instrument proliferation issues because it uses a larger set of instruments than the difference GMM system. We address this issue by limiting the number of lags of the endogenous variables.[4] The consistency of the GMM estimator depends on two conditions: the validity of the assumption that the error term is not serially correlated (AR(2)) and the validity of the instruments (Hansen test). The key identification assumption of the Hansen test is that the instruments used in the model are valid and uncorrelated with the residuals. Too many instruments can seriously weaken and bias the Hansen test regarding identification restrictions; the general rule is therefore that the number of instruments must be less than the number of countries (Roodman, 2009a).

3.0 Results and Discussion

4.1 Preliminary Tests

After examining the characteristics of the data in this study, we test for cross-sectional dependence and present the results in Table 3 below, which show that the null hypothesis of no dependence among countries is strongly rejected by the data distribution statistics. Thus, the heterogeneity of the panel is confirmed.

Next, the stationarity of the variables is examined using the Levin, Lin and Chu (Levin et al., 2002) stationarity test. As shown in Table 4 below, the null hypothesis that the series contains a unit root for all variables cannot be rejected in the level forms. However, the null hypothesis is strongly accepted in the level and first-difference forms of the variables, and the series becomes non-stationary.

Furthermore, multicollinearity is examined in Table 5, with the multicollinearity test showing that all VIF values are less than 10. We can therefore conclude that there is no multicollinearity. This implies that our model is well-specified.

Table 3: Cross-sectional dependence

Variables	CD-test	P-Value
HHI	28.26	0.000
Urbanisation	136.79	0.000
Education	28.15	0.000
Industrialisation	11.09	0.000
GDP (ln)	70.64	0.000
TNR	72.31	0.000

Source: Authors

[2] This estimator is asymptotically more efficient than the difference GMM (Roodman, 2009a).

[3] All explanatory variables are considered potentially endogenous.

[4] We performed the estimates using the Stata command *xtabond2* following Roodman (2009b).

Table 4: Unit root test

Variables	Statistics	Prob	Decision
HHI	-3.35208	0.0004	I(0)
Urbanisation	-15.5306	0.0000	I(0)
Education	-4.05123	0.0000	I(0)
Industrialisation	-8.03054	0.0000	I(1)
GDP (ln)	-6.54348	0.0000	I(0)
TNR	-2.63979	0.0041	I(0)

Source: Authors

Table 5: Multicolinearity test

	VIF	1/VIF
GDP (ln)	3.417	.293
Education	3.042	.329
URB	2.145	.466
Industrialisation	1.216	.822
TNR	1.138	.878
Mean VIF	2.192	.

Source: Authors

4.2 Baseline Results

The results in Table 6 below show that urbanisation has a negative and statistically significant effect on economic diversification as measured by the Herfindahl-Hirschman Index (HHI). This finding indicates that urbanisation reduces economic diversification. In other words, this result suggests that urban expansion does not always foster a broader range of economic activities. One possible explanation is that in highly urbanised regions agglomeration benefits lead to increasing specialisation (new or low-profit industries are displaced in favour of dominant sectors) rather than diversification. Furthermore, rapid urbanisation can lead to constraints (high land costs, lack of infrastructure, pollution, congestion) that hinder the emergence of new businesses or sectoral diversification. This forced specialisation can expose the local economy to external shocks (particularly a decline in demand for the dominant sector), given that there is little stability in other sectors. Indeed, research by the Economic Commission for Africa (ECA, 2021) shows that rapid urbanisation in Africa often coincides with stagnation or a decline in industrial productivity in several countries, which hinders diversification. This finding is consistent with studies conducted by Celik et al. (2024). In their work, these authors demonstrate that the potential benefits of urban agglomeration are only fully realised if cities have sufficient connectivity, diversified productive capacities and integration into international trade; in other words, they show that urban growth does not necessarily lead to diversification.

Education has a negative and statistically significant effect on economic diversification. This finding implies that an increase in educational attainment does not automatically lead to the emergence of new productive sectors. In oil-exporting countries, for example, high levels of schooling can fuel high wage expectations, contribute to the emigration of the most highly skilled workers or encourage specialisation in so-called “protected” or public sectors to the detriment of diversified industrial or manufacturing development. Furthermore, if educational qualifications are low or poorly aligned with the skills required by emerging sectors, investment in education will produce graduates who are not readily employable in new sectors, thereby limiting diversification. Research conducted by Matallah (2022) finds a significant negative effect of education on long-term economic diversification in oil-exporting Gulf countries, which corroborates this finding. This result, while certainly counter-intuitive, can also be interpreted as a mismatch between African education systems and the structural needs of economic transformation: an education system that produces skills poorly aligned with productive sectors can hinder diversification by directing the workforce toward activities that are not very innovative or structured. The work of Mutai et al. (2026) shows, for example, that certain types of education, particularly short-term training programmes, can have negative effects on economic performance due to skills-job mismatches, thereby limiting economies’ ability to diversify. Furthermore, when investment in education is high in quantity but insufficient in quality or misdirected, it can divert resources away from other key factors

(innovation, industrialisation) (Kumeka et al., 2024).

Like education, industrialisation also has a negative and statistically significant effect on economic diversification. This finding shows that industrialisation reduces economic diversification. It also suggests that industrial development may actually limit the variety of productive sectors under certain circumstances (for example, by concentrating resources in a few dominant industries). This dynamic could occur if industrialisation relies too heavily on basic or extractive industries, or on technology transfer without local adaptation, which hinders the emergence of new industrial or service sectors. To illustrate, the study by Iheonu et al. (2025) on sub-Saharan Africa shows that energy price volatility reduces manufacturing growth in countries where industry is already poorly diversified, thereby reinforcing dependence on a few dominant sectors. Again, with regard to Lesotho, the study by Yuni et al. (2023) shows that despite the implementation of dynamic industrial policies, the factors of weak infrastructure, exorbitant energy prices and institutional constraints hinder the expansion of industrialisation into other sectors, thereby posing an obstacle to diversification.

It was found that per capita GDP has a positive and significant effect on economic diversification. This is because as per capita GDP increases, economies tend to further diversify their production structure in terms of products and markets. More specifically, higher per capita wealth is linked to a greater capacity to develop new sectors and explore new markets, moving beyond mere dependence on a few dominant activities. This can be explained by the fact that higher incomes provide the necessary resources for investment in innovation, training, infrastructure and institutions — all of which are drivers of diversification. It is also to be noted that consumers in wealthier countries demand a wider range of goods and services, leading firms to innovate and diversify. A study by Obeng (2022) on Ghana shows that a one-percent increase in GDP per capita increases product diversification by 0.315 percentage points and access to new markets by 0.116 percentage points in the long term.

Another finding is that natural resource rents have a positive and statistically significant effect on economic diversification. This suggests that natural resource rents can provide the necessary funding to invest in infrastructure, technology and the development of productive capacity in non-extractive sectors. This result may also suggest that resource-rich countries are capable of using these revenues to stimulate manufacturing industries or value-added services, rather than remaining focused on the raw materials sector. Such an effect likely presupposes the existence of relatively strong institutions capable of managing the rent, avoiding waste, corruption or excessive dependence on the extractive sector. Research conducted, for example, by Jolo et al. (2022) on a sample of resource-rich countries over the period 2001 to 2019 shows that natural resource rent stimulates economic diversification when institutions are sufficiently robust.

Table 6: Baseline results

	Driscoll and Kraay	**GLS**
	Dependent variable: HHI	
Variables	(1)	(2)
Urbanisation	-0.00139***	-0.00139***
	(0.000307)	(0.000256)
Education	-0.00178***	-0.00178***
	(0.000146)	(0.000207)
Industrialisation	-0.00199***	-0.00199***
	(0.000276)	(0.000530)
GDP (ln)	0.0324***	0.0324***
	(0.0113)	(0.00556)
TNR	0.00143***	0.00143***

	(0.000246)	(0.000309)
Constant	0.673***	0.673***
	(0.0739)	(0.0314)
Observations	630	630
R-squared	0.271	
Number of groups	48	

Standard deviations in parentheses
**** p<0,01, ** p<0,05, * p<0,10*

Source: Authors

4.3 Robustness Check

4.3.1 Use of an Alternative Estimation Strategy

The results in Table 7 below show that urbanisation has a negative and statistically significant effect on economic diversification. This result is identical to that presented in Table 6 of the baseline results. The p-values for the AR(1) model are all significant and below 1%. In contrast, the p-values for the AR(2) model are not significant. The Hansen test validates the quality of the instrument. That said, urban growth does not necessarily lead to a proportional increase in the variety of productive sectors; on the contrary, it may reinforce the dominance of certain sectors such as services, real estate or consumption, at the expense of other sectors such as agriculture or industry. According to Di Clemente et al. (2021), for highly urbanised countries, the relationship between urbanisation and economic complexity weakens, or even becomes negligible, when the economy is heavily dependent on resource exports. This may mean that economic diversification is hampered by diminishing returns from urbanisation or that institutional structures and policies are not adapting quickly enough to keep pace with urban expansion. As the OECD report (OECD, 2025) warns, without planned urbanisation, effective urban governance and investment in infrastructure, urbanisation can become a source of economic vulnerability rather than diversification.

With regard to the control variables, it is reported that all the control variables listed in Table 7 below yield results identical to those previously found in the baseline results. It must therefore be concluded that our results are robust and generally significant when we use the generalised method of moments in a two-stage system.

Table 7: Robustness with an alternative estimation method

	Estimation strategy: SGMM			
	Dependent variable: HHI			
Variables	(1)	(2)	(3)	(4)
L.HHI	0.690***	0.593***	0.736***	0.743***
	(0.0218)	(0.0255)	(0.0118)	(0.0230)
Urbanisation	-0.000225**	-0.000356***	-0.000256***	-0.000270***
	(8.54e-05)	(9.38e-05)	(3.68e-05)	(8.83e-05)
Education	-0.000488***	-0.000470***	-0.000547***	-0.000574***
	(3.91e-05)	(4.11e-05)	(4.48e-05)	(6.09e-05)
Industrialisation		-0.00114***	-0.000925***	-0.000625***
		(6.85e-05)	(9.92e-05)	(0.000119)
GDP (ln)			0.00654***	0.00776***
			(0.000881)	(0.00133)
TNR				0.000233***
				(3.57e-05)
Constant	0.270***	0.362***	0.203***	0.184***
	(0.0182)	(0.0224)	(0.00662)	(0.0186)

Observations	607	539	539	529
Number of id country	51	46	46	46
Number of instruments	45	44	45	42
AR(1) : *p-values*	4.21e-05	0.000126	0.000132	0.000125
AR(2) : *p-values*	0.132	0.131	0.121	0.111
Hansen OIR : *p-values*	0.438	0.460	0.538	0.251

Standard deviations in parentheses.
**** p<0,01, ** p<0,05, * p<0,10*

Source: Authors

4.3.2 Robustness with the Addition of Control Variables

New variables are now added to our baseline model: inflation, foreign direct investment (FDI) and trade openness. Inflation is measured by the consumer price index, which actually refers to the price indices for consumer goods and services compared to a specific base period (2010 = 100) (World Bank, 2023). Foreign direct investment (as a percentage of GDP) corresponds to the sum of equity, reinvested earnings, other long-term capital and short-term capital, as reported in the balance of payments (World Bank, 2023). Trade openness (as a percentage of GDP) represents the sum of exports and imports of goods and services measured as a percentage of gross domestic product (World Bank, 2023). The results are presented in Table 8 below (column 3).

These results show that inflation has a positive and statistically significant effect on economic diversification. This finding suggests that, all else being equal, an increase in inflation promotes economic diversification, that is, the reallocation of resources to new sectors. It is therefore possible that inflation creates incentives for the reallocation of productive factors toward sectors less exposed to rising prices or toward niche markets, thereby stimulating economic diversity. This result is consistent with recent work by Jolo et al. (2022), who show in their study that inflation has a positive and significant effect on economic diversification in resource-rich countries. Foreign direct investment (FDI) has a negative and statistically significant effect on economic diversification. This means that FDI reduces economic diversification. This finding can be explained by the fact that much of FDI is concentrated in already dominant sectors or in extractive industries, which reinforces existing specialisations rather than encouraging the emergence of new sectors (Djermoun et al., 2025).

Finally, trade openness has a positive and statistically significant effect on economic diversification. This result clearly demonstrates that trade openness increases economic diversification. This result may also reflect the fact that trade openness acts as a catalyst for economic diversification by enabling economies to access new markets and a variety of new inputs, as well as to benefit from the effects of competition that stimulate the growth of emerging sectors (Seti et al., 2025). By facilitating trade in intermediate goods, this allows local industries to specialise in more diversified value chains. The work of Yu and Meng (2023) shows that industries with more diversified inputs experience faster growth in more open countries.

Table 8: Robustness with the addition of control variables

	Dependent variable: HHI		
Variables	(1)	(2)	(3)
L.HHI	0.769***	0.769***	0.924***
	(0.0187)	(0.0329)	(0.0125)

Urbanisation	-0.000309***	-0.000316***	-0.000133*
	(7.17e-05)	(8.24e-05)	(6.60e-05)
Education	-0.000555***	-0.000583***	-0.000173***
	(3.69e-05)	(3.19e-05)	(4.34e-05)
Industrialisation	-0.000613***	-0.000680***	-0.000413***
	(8.67e-05)	(0.000126)	(0.000130)
GDP (ln)	0.00826***	0.00829***	0.00102
	(0.00141)	(0.00120)	(0.00105)
TNR	0.000235***	0.000292***	-1.76e-05
	(3.75e-05)	(6.46e-05)	(9.69e-05)
Inflation	8.88e-05***	9.45e-05***	6.19e-05***
	(1.18e-05)	(1.62e-05)	(1.22e-05)
FDI		-0.000115	-0.000227***
		(7.52e-05)	(5.04e-05)
Trade openness			3.46e-05***
			(5.64e-06)
Constant	0.152***	0.153***	0.0620***
	(0.0140)	(0.0237)	(0.0100)
Observations	510	507	460
Number of id country	45	45	43
Number of instruments	42	40	36
AR(1) : *p-values*	0.000209	0.000185	0.000374
AR(2) : *p-values*	0.143	0.120	0.273
Hansen OIR : *p-values*	0.229	0.211	0.457

Standard deviations in parentheses.
**** p<0,01, ** p<0,05, * p<0,10*

Source: Authors

4.3.3 Transmission Mechanisms Results

Institutions can be viewed as the channel through which urbanisation affects economic diversification. As such, to analyse how institutions shape the impact of urbanisation on economic diversification, the researchers included institutional variables and their interaction with urbanisation in the model. Four institutional variables were taken into account: the rule of law, regulatory quality, political stability and government effectiveness.

The rule of law assesses stakeholders' confidence in social norms and compliance with them, particularly regarding the enforcement of contracts, property rights, law enforcement and the judicial system, as well as the risk of crime and violence. The *World Governance Indicators* (WGI) presents the quality of regulation as a set of research data synthesising opinions on the quality of governance expressed by a large number of companies, citizens and experts surveyed in industrialised and developing countries. Political stability measures the perceived likelihood of political instability and/or politically motivated violence, including terrorism. Government effectiveness reflects perceptions of the quality of public services, the quality of the civil service and its degree of independence from political pressures, the quality of policy formulation and implementation, as well as the credibility of the government's commitment to these policies. All these variables are drawn from the World Bank's (2023) *World Governance Indicators* (WGI) database. The measurement of each of these variables yields a score for each country in units of a standard normal distribution, ranging from -2.5 to 2.5. The results are presented in Table 9 below.

All institutional variables used in this study (the rule of law, regulatory quality, political stability and government effectiveness) have a positive and statistically significant effect on economic diversification. Conversely, the interaction between each of these institutional variables and urbanisation shows a negative and statistically significant effect on economic diversification. This result may indicate that in contexts where institutions are weak, urbanisation tends to concentrate resources, favour traditional or extractive sectors and limit the emergence of new economic sectors, leading to an impoverishment of the productive structure. Conversely, even in countries with stronger institutions, if regulation or stability does not allow for adjustments or innovation, urbanisation could exacerbate regional and sectoral inequalities, thereby hindering economic diversification. A study conducted by Nganga (2021) in the CEMAC region shows that political stability, while seemingly beneficial, acts as an obstacle to economic diversification if it is not accompanied by effective anti-corruption measures and an efficient regulatory framework. The study by Mini et al. (2025), conducted in African countries over the period from 1996 to 2021, shows that the relationship between institutional quality and economic complexity is sometimes non-linear, suggesting that institutions must reach a certain level before they can positively translate urbanisation into economic diversification.

Table 9: Transmission Mechanisms Results

	Dependent variable: HHI			
Variables	(1)	(2)	(3)	(4)
L.HHI	0.790***	0.827***	0.901***	0.945***
	(0.0214)	(0.0200)	(0.0118)	(0.0134)
Urbanisation	-0.000570***	-0.000509***	-0.000337***	-0.000363***
	(0.000114)	(9.57e-05)	(8.60e-05)	(9.26e-05)
Education	-0.000373***	-0.000411***	-0.000123**	-7.12e-06
	(7.28e-05)	(3.15e-05)	(5.03e-05)	(4.46e-05)
Industrialisation	-0.000698***	-0.000607***	-0.000530***	-0.000506***
	(0.000177)	(0.000156)	(0.000116)	(0.000180)
GDP (ln)	0.00321	0.00474***	0.000152	0.00165
	(0.00191)	(0.00146)	(0.000927)	(0.00126)
TNR	0.000209***	9.88e-05**	4.02e-05	-0.000159
	(4.71e-05)	(4.03e-05)	(4.11e-05)	(0.000102)
Rule of Law	0.0227***			
	(0.00446)			
RL×URB	-0.000484***			
	(9.61e-05)			
Regulatory Quality		0.0182***		
		(0.00406)		
RQ×URB		-0.000404***		
		(0.000103)		
Political Stability			0.0134***	
			(0.00225)	
PS×URB			-0.000298***	
			(5.00e-05)	
GE				0.0100**
				(0.00417)
GE×URB				-0.000319***
				(7.96e-05)

Constant	0.187***	0.147***	0.104***	0.0526***
	(0.0139)	(0.0141)	(0.0102)	(0.0164)
Observations	470	470	470	470
Number of id country	45	45	45	45
Number of instruments	40	40	40	32
AR(1) : *p-values*	0.000151	0.000126	0.000151	0.000172
AR(2) : *p-values*	0.104	0.100	0.101	0.100
Hansen OIR : *p-values*	0.278	0.236	0.376	0.633

Note: URB = Urbanisation; TNR = Total Natural Resources; RL = Rule of Law; RQ = Regulatory Quality; PS = Political Stability; GE = Government Effectiveness; GDP = Gross Domestic Product; HHI = Herfindahl-Hirschman Index.

*Standard deviations in parentheses. *** p<0,01, ** p<0,05, * p<0,10*

Source: Authors

4.3.4 Use of the Alternative Measure of Economic Diversification

To ensure the robustness of our previous results when using a different indicator of economic diversification, we employ the Theil Index, which measures the volume of a country's exports and the degree to which those exports are concentrated on specific products. In principle, a low index value indicates a high degree of export diversification, and vice versa. Technically, without considering individual and temporal indices, the indicator is calculated as follows:

$$Theil = \frac{1}{N}\sum_{j}^{N} \frac{Export_value}{Average_Export_value} \ln\left(\frac{Export_value}{Average_Export_value}\right) \quad (4)$$

with j representing the product index and N representing the total number of products.

The estimation results for Equation (4) above, using the Theil Index as the dependent variable, are presented in Table 10 below. The table shows that, when using the Theil index, urbanisation consistently has a negative and statistically significant effect on economic diversification. This corroborates the findings previously reported in the baseline results. Similarly, the control variables used are all significant and retain the same sign. Overall, the results in Table 10 corroborate the results obtained in Table 6 and Table 7.

Table 10: Robustness with alternative measure of economic diversification

	Dependent variable: Theil Index			
Variables	(1)	(2)	(3)	(4)
L.Theilindex	0.393***	0.648***	0.722***	0.713***
	(0.0243)	(0.0323)	(0.0435)	(0.0255)
Urbanisation	-0.00559***	-0.00439***	-0.00488**	-0.00309***
	(0.00194)	(0.000795)	(0.00186)	(0.000790)
Education	-0.0116***	-0.00579***	-0.00663***	-0.00581***
	(0.000700)	(0.000135)	(0.00106)	(0.000636)
Industrialisation		-0.0321***	-0.0276***	-0.0157***
		(0.00238)	(0.00390)	(0.00319)
GDP (ln)			0.0820***	0.0543***
			(0.0234)	(0.0176)
TNR				0.0146***
				(0.000908)

Constant	2.645***	1.828***	1.024***	0.874***
	(0.133)	(0.108)	(0.165)	(0.171)
Observations	489	425	425	416
Number of id country	43	39	39	39
Number of instruments	33	36	30	36
AR(1) : *p-values*	0.00690	0.00449	0.00402	0.00497
AR(2) : *p-values*	0.761	0.308	0.309	0.314
Hansen OIR : *p-values*	0.244	0.285	0.212	0.355

Standard deviations in parentheses.

**** p<0,01, ** p<0,05, * p<0,10*

Source: Authors

4.0 Conclusion and Economic Policy Recommendations

This study had two objectives: to analyse the effect of urbanisation on economic diversification in Africa and to examine the channels through which urbanisation influences economic diversification in Africa. To achieve these objectives, we used the method proposed by Driscoll and Kraay (1998), the Generalised Least Squares (GLS) method and the two-stage Generalised System of Moments (SGMM) method. The data used in this study were drawn from the World Bank's *World Development Indicators* and *World Governance Indicators* databases, as well as UNCTAD's Comtrade database. We used a sample of 53 African countries for the period from 2000 to 2022. The measure of economic diversification used in the baseline results was the Herfindahl-Hirschman Index. The results of this research show that urbanisation has a negative and statistically significant effect on economic diversification in African countries. This result sufficiently demonstrates that urban expansion significantly reduces economic diversification. Also, institutional variables such as the rule of law, regulatory quality, political stability and government effectiveness are the channels through which urbanisation influences economic diversification. We also used the Theil index as an alternative measure of economic diversification. It turned out that when using this index as an alternative measure of economic diversification, the results were identical to those obtained in the baseline analysis on the one hand, and when changing the estimation strategy on the other.

Several economic policy recommendations can be identified based on the findings of this study. First, it is necessary to implement strategic urban planning to support productive sectors. This will promote better-planned urbanisation by integrating industrial, technological and artisanal zones into cities to aid the development of diversified economic sectors. Second, urban economic infrastructure must be strengthened. This is necessary because investment is required in key transport infrastructure (energy, transport and telecommunications) to improve intra- and inter-urban connectivity, which facilitates the emergence and growth of businesses across various sectors. Third, informal economic activities should be formalised and supported. In this context, inclusion policies (training, access to credit, simplified taxation) should be implemented to integrate the informal economy into formal value chains, thereby promoting more visible and sustainable diversification. Finally, skills and innovation should be developed in urban areas. This recommendation should help strengthen technical education, vocational training and urban incubators to develop a workforce suited to a diversified economy, particularly in the service sector, local processing and the creative industries.

Nevertheless, this study has limitations that open up avenues for future research. First, although the study covers a wide range of African countries, supplementing the analysis with more qualitative studies, e.g., specific case studies, would provide more reliable contextual information for the econometric estimates. Second, future research should take into account the regional disparities that influence the link between urbanisation and economic diversification in Africa.

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