



CIEP

**From Hydrocarbon Dependence to Economic
Diversification for better integration into the
global economy: The Case of Equatorial Guinea**

**De la dependencia hidrocarburífera a la
diversificación económica para una mejor
integración en la economía mundial: el caso de
Guinea Ecuatorial**

Jean Pierre MEMANG ANGO

Afro American University of Central Africa- AAUCA

<https://orcid.org/0009-0005-4627-2495>

Alain Sauter ELONG EBA

University of Yaoundé 2- International Relations Institute of Cameroon-IRIC

Afro American University of Central Africa- AAUCA

<https://orcid.org/0009-0009-6527-4794>

Agustina Mangué EKORO MIKUE

Student

Afro American University of Central Africa's

<https://orcid.org/0009-0009-5972-3768>

Abstract

This article examines Equatorial Guinea's difficult transition from a hydrocarbon-dependent economy toward a more diversified productive structure. Despite two decades of substantial oil revenues and its classification as an upper-middle-income country, Equatorial Guinea remains highly exposed to external shocks, with hydrocarbons accounting for most export earnings and a limited contribution from non-oil sectors. The study combines a systematic review of the literature on the resource curse, Dutch disease and economic diversification with an empirical analysis based on Principal Component Analysis (PCA) and Ordinary Least Squares (OLS) estimations. PCA is used to describe sectoral dynamics and construct a composite economic diversification index, while OLS models assess the contribution of selected sectors to GDP growth and the trade balance. The results show an average diversification index of 52.07%, suggesting an intermediate level of diversification. They also reveal a strong negative relationship between the hydrocarbon sector and emerging diversification sectors such as agriculture, fisheries and manufacturing. However, the growth effects of these sectors are uneven: forestry, petroleum refining and the restaurant-hotel sector show positive associations with oil-related growth, whereas agriculture is negatively associated with GDP at market prices. Overall, the findings suggest that Equatorial Guinea's diversification process remains incomplete and that the expected positive effect of non-oil sectors on growth is only partially confirmed.

Keywords: economic diversification; hydrocarbon dependence; rentier economy; resource curse; Equatorial Guinea

Resumen

Este artículo analiza la difícil transición de Guinea Ecuatorial desde una economía dependiente de los hidrocarburos hacia una estructura productiva más diversificada. A pesar de dos décadas de importantes rentas petroleras y de su clasificación como país de ingreso medio-alto, Guinea Ecuatorial sigue altamente expuesta a choques externos, con una fuerte concentración de sus exportaciones en el sector hidrocarburífero y una contribución limitada de los sectores no petroleros. El estudio combina una revisión sistemática de la literatura sobre la maldición de los recursos, el síndrome holandés y la diversificación económica con un análisis empírico basado en el Análisis de Componentes Principales (ACP) y estimaciones mediante Mínimos Cuadrados Ordinarios (MCO). El ACP permite describir la dinámica sectorial y construir un índice compuesto de diversificación económica, mientras que los modelos MCO evalúan la contribución de sectores seleccionados al crecimiento del PIB y a la balanza comercial. Los resultados muestran un índice promedio de diversificación de 52.07%, lo que sugiere un nivel intermedio de diversificación. Asimismo, evidencian una relación negativa entre el sector hidrocarburífero y sectores emergentes de diversificación como la agricultura, la pesca y la manufactura. Sin embargo, los efectos sobre el crecimiento son desiguales: la silvicultura, la refinación de petróleo y el sector restaurantes-hoteles presentan asociaciones positivas con el crecimiento vinculado al petróleo, mientras que la agricultura se asocia negativamente con el PIB a precios de mercado. En conjunto, los hallazgos sugieren que el proceso de diversificación de Guinea Ecuatorial sigue siendo incompleto y que el efecto positivo esperado de los sectores no petroleros sobre el crecimiento solo se confirma parcialmente.

Palabras clave: diversificación económica; dependencia hidrocarburífera; economía rentista; maldición de los recursos; Guinea Ecuatorial.

CC BY-NC 4.0



General Introduction contextual framework

Equatorial Guinea is one of the most illustrative cases of hydrocarbon dependence in sub-Saharan Africa. Since the discovery and large-scale exploitation of oil reserves in the 1990s, the country has experienced a rapid increase in national income and has been classified as an upper-middle-income economy. However, this apparent prosperity has not translated into broad-based structural transformation. The economy remains highly dependent on hydrocarbons, while non-oil sectors continue to play a limited role in production, employment, exports and fiscal revenue.

This dependence has exposed the country to significant macroeconomic vulnerability. In 2024, hydrocarbons still accounted for 46.1% of GDP and more than 90% of exports, confirming the persistence of a highly concentrated productive and export structure (African Development Bank, 2025). Moreover, the continued decline in hydrocarbon production has placed sustained pressure on fiscal and external balances, while medium-term growth prospects remain weak (International Monetary Fund, 2025). These trends reveal the fragility of a growth model based on extractive rents and underscore the urgency of accelerating non-hydrocarbon growth.

The Equatoguinean case therefore raises a central development question: how can a country endowed with substantial oil wealth move from a hydrocarbon-dependent economy to a genuinely diversified and sustainable productive structure? This question is particularly relevant because the oil boom generated large public revenues, but these resources were not sufficient to create a resilient non-oil economy. Agriculture, fisheries, tourism, forestry and manufacturing remain underdeveloped, despite their potential contribution to employment creation, export diversification and long-term economic resilience. Recent policy assessments have stressed that Equatorial Guinea needs to build the foundations for renewed, more diversified and inclusive growth through stronger institutions, a better business environment and a more dynamic private sector (World Bank, 2025).

In this context, the present article examines the transition from a hydrocarbon-dependent economy to a diversified economy in Equatorial Guinea. The study is guided by two research questions. First, what are the main structural and institutional factors shaping economic diversification in Equatorial Guinea? Second, what effects do non-oil sectors—particularly agriculture, fisheries, tourism and manufacturing—have on economic growth and the external sector?

The article pursues two complementary objectives. The first is to identify and analyse the structural and institutional factors that condition the country's diversification process. The second is to empirically assess the contribution of selected non-oil sectors to economic growth and the trade balance. Based on these objectives, two hypotheses are formulated. The first hypothesis states that diversification-related sectors, such as agriculture and fisheries, are negatively correlated with the hydrocarbon sector but positively associated with other non-oil activities, reflecting a gradual process of sectoral reallocation. The second hypothesis states that agriculture, fisheries, tourism and manufacturing have a positive effect on Equatorial Guinea's economic growth. Methodologically, the study adopts a mixed approach. It combines a review of the literature on the resource curse, Dutch disease and economic diversification with an empirical analysis based on Principal Component Analysis (PCA) and Ordinary Least Squares (OLS) estimations. PCA is used to describe sectoral dynamics and construct a composite economic diversification index. OLS models are then applied to estimate the effects of selected productive sectors on GDP growth and the trade balance. This methodological strategy makes it possible to connect the theoretical discussion on rentier economies with empirical evidence from Equatorial Guinea.

Equatorial Guinea — Socioeconomic Overview

Equatorial Guinea is a relatively small Central African state covering approximately 28,051 km², yet its maritime Exclusive Economic Zone extends to 310,000 km² — eleven times its land area. Some 87% of its territory is covered by dense forest forming part of the Congo Basin, the world's second-largest forest reserve. The country's total population is estimated at around 1.89 million inhabitants, growing at roughly 2.4% per year. Equatorial Guinea is located at the interface of the Gulf of Guinea and Central Africa. It consists of a mainland portion (Río Muni) bordered to the north by Cameroon, and to the east and south by Gabon, along with a scattered island group in the Gulf of Guinea: Bioko Island to the north (where the capital Malabo is located), Annobón Island to the south-west, and the islets of Corisco, Elobey Grande and Elobey Chico at the mouth of the Muni Estuary. Its total area of approximately 28,051 km² makes it one of the smallest states on the African continent. The following maps show Equatorial Guinea area.

Map1. Maps of Equatorial Guinea



Source: <https://www.worldatlas.com/maps/equatorial-guinea>

From a macroeconomic standpoint, the country boasts one of the highest GDP per capita figures in sub-Saharan Africa, at around USD 6,745 — a legacy of its oil boom. However, this apparent prosperity conceals far deeper structural fragility. Hydrocarbons still account for 46% of GDP and over 80% of public revenues, masking a trajectory of continuous production decline since around 2005. The economy remains overwhelmingly dependent on hydrocarbons.

The country's social indicators remain particularly worrying: infant mortality stands at a high 78 per thousand, life expectancy is limited to 60.7 years, and physician density is severely inadequate at only 3 doctors per 10,000 inhabitants. Nearly a quarter of the population lacks access to electricity, and more than a third has no access to safe running water. Furthermore, the country ranks among the worst performers in terms of governance, scoring 13 out of 100 on the Corruption Perceptions Index and placing 173rd out of 180 countries worldwide.

In summary, Equatorial Guinea presents a striking paradox: considerable oil wealth coexisting with widespread poverty, insufficient economic diversification, and severely underdeveloped public services. The article is organised into four sections. The first reviews the theoretical and empirical literature on hydrocarbon dependence, resource-based development and economic diversification. The second presents the data, variables and methodological strategy. The third discusses the empirical results. The fourth analyses the implications of the findings for Equatorial Guinea's insertion into the global economy and formulates policy recommendations aimed at supporting a more diversified, resilient and inclusive development model.

1. Literature Review

This section reviews the main theoretical and empirical contributions that help explain the difficulties faced by hydrocarbon-dependent economies in their transition toward more diversified productive structures. The discussion is organized around four dimensions: the theoretical foundations of hydrocarbon dependence, the determinants of economic diversification, the role of digital transformation and governance, and the importance of human capital and regional integration.

1.1. Hydrocarbon Dependence: Theoretical Foundations

The transition from a hydrocarbon-dependent economy to a diversified productive structure remains one of the central challenges for resource-rich developing countries. The economic literature has developed a robust theoretical framework to explain why abundant natural resources do not automatically lead to sustained development. Two concepts are particularly relevant for the analysis of Equatorial Guinea: the resource curse and Dutch disease. The resource curse thesis suggests that countries endowed with abundant natural resources may experience weaker long-term growth, lower institutional quality and limited productive diversification. Auty (1993) introduced the concept to explain the paradox of mineral-rich economies that fail to translate resource wealth into sustained development. Sachs and Warner (1995, 2001) later provided influential empirical evidence showing that economies with high dependence on natural resource exports tend to grow more slowly than less resource-dependent countries. This literature argues that extractive rents may reduce incentives for productive investment, weaken accountability, encourage rent-seeking behaviour and delay the development of competitive non-resource sectors.

Subsequent contributions have refined this argument by emphasizing that the resource curse is not inevitable. Rather, its effects depend on the quality of institutions, fiscal management and public investment. Van der Ploeg (2011) argues that natural resources can be either a curse or a blessing depending on whether resource rents are transformed into productive assets, human capital and long-term savings. Ross (2012) also shows that oil wealth can shape political and institutional incentives in ways that undermine accountability and economic diversification. In this sense, the central issue is not the existence of oil revenues in itself, but the way in which these revenues are governed, allocated and converted into sustainable development capacities.

A second key concept is Dutch disease, originally theorized by Corden and Neary (1982). Dutch disease describes the mechanism through which a booming extractive sector generates large foreign exchange inflows, appreciates the real exchange rate and reduces the competitiveness of non-extractive sectors such as agriculture, manufacturing and tradable services. In hydrocarbon-dependent economies, this dynamic can discourage investment in productive diversification and reinforce structural dependence on oil exports. For Equatorial Guinea, this theoretical framework is particularly relevant because the oil boom generated rapid income growth, but also contributed to the weakening of non-oil productive sectors.

Overall, these theoretical approaches show that hydrocarbon dependence creates a double vulnerability. On the one hand, it exposes the economy to external shocks linked to international oil prices and declining production. On the other hand, it may weaken the incentives and institutional capacities required to develop alternative sectors. Therefore, diversification must be understood not only as a sectoral policy, but also as an institutional and structural transformation process.

1.2. Economic Diversification: Empirical and Sectoral Approaches

Economic diversification refers to the expansion of a country's productive and export base beyond a narrow set of commodities or activities. In resource-dependent economies, diversification is essential to reduce vulnerability to price shocks, generate employment, increase productivity and promote inclusive growth. UNCTAD (2021) emphasizes that commodity-dependent developing countries need technological upgrading and innovation to escape commodity dependence, increase value addition and build more resilient productive structures. UNCTAD (2023) further argues that inclusive diversification is particularly urgent in the context of the global energy transition, since commodity-dependent economies face growing pressure to adapt their development models.

The classical literature on structural transformation provides an important analytical foundation for understanding diversification. Lewis (1954) argued that development involves the movement of labour from low-productivity traditional sectors to higher-productivity modern sectors. Hirschman (1958) later emphasized the importance of linkages, showing that some sectors can generate backward and forward connections that stimulate broader economic transformation. From this perspective, diversification is not only a matter of adding new sectors, but of creating productive interdependence among them.

More recent approaches highlight the role of industrial policy and productive capabilities. Rodrik (2004, 2007) argues that diversification cannot be left entirely to market forces because new sectors often face coordination failures, information gaps and high initial risks. The state must therefore play a strategic role by supporting experimentation, removing bottlenecks and facilitating the emergence of competitive activities. Lin (2012), from the perspective of new structural economics, also stresses that developing countries should promote sectors consistent with their latent comparative advantages while investing in the infrastructure and capabilities needed to move gradually toward higher value-added activities. The economic complexity literature adds another useful dimension. Hidalgo and Hausmann (2009) argue that successful diversification depends on the accumulation of productive knowledge and capabilities. Hausmann et al. (2014) further develop this approach by showing that countries diversify more effectively when they move toward activities that are close to their existing capabilities but allow them to increase technological sophistication and value added. This framework is relevant for Equatorial Guinea because diversification should not be conceived as a sudden break with the existing economic structure, but as a gradual process of building capabilities in sectors such as agriculture, fisheries, forestry, tourism, agro-processing and selected services.

In the case of Equatorial Guinea, sectoral diversification could rely on several areas with productive potential. Agriculture may contribute to food security, rural employment and agro-industrial development if supported by infrastructure, land policy, extension services and local value chains. Fisheries and aquaculture are also relevant because the country has maritime resources that remain insufficiently integrated into domestic processing and export strategies. Forestry can contribute to diversification if it moves beyond raw timber extraction toward sustainable management, certification and local processing. Tourism, particularly ecotourism and coastal tourism, may become a complementary source of foreign exchange if supported by infrastructure, connectivity, environmental protection and a more open business environment.

However, these sectors cannot generate transformation by themselves. Their contribution depends on complementary reforms in infrastructure, finance, human capital, governance, trade facilitation and institutional coordination. Therefore, sectoral diversification must be linked to a broader development strategy capable of connecting productive activities, domestic firms, public investment and external markets.

1.3. Digital Transformation, Governance and Diversification in Equatorial Guinea

Digital transformation has increasingly become a complementary vector of economic diversification. For commodity-dependent economies, digital technologies can help improve productivity, reduce transaction costs, expand access to services, strengthen public administration and create new opportunities for firms and workers. UNCTAD (2021) argues that technology and innovation are central to escaping commodity dependence because they allow countries to move beyond primary exports and generate higher value-added activities. In Equatorial Guinea, digital transformation remains closely linked to the broader challenge of structural diversification. The World Bank (2024) notes that digital development can support a safer and more inclusive transformation, but this requires improvements in connectivity, digital skills, institutional capacity and regulatory frameworks. Digitalization may also support diversification indirectly by improving tax administration, public service delivery, business registration, trade logistics and access to financial services.

Governance is another decisive factor. The diversification experience of resource-rich countries shows that productive transformation requires more than sectoral plans. It depends on credible institutions, transparent management of resource revenues, policy continuity and a business environment that encourages private investment. Recent assessments of Equatorial Guinea confirm the persistence of this challenge. The African Development Bank (2025) reports that the country remains highly dependent on hydrocarbons and that its external position is vulnerable to declining hydrocarbon export revenues. The IMF (2025) similarly warns that the country faces the challenge of replacing diminishing natural resource wealth with a diversified and inclusive economy, while still lacking the necessary economic architecture. The World Bank (2025) also stresses the need to build the foundations for renewed, more diversified and inclusive growth through stronger institutions, better public investment, improved human capital and a more dynamic private sector.

This is particularly important because diversification strategies in Equatorial Guinea have often been constrained by weak intersectoral coordination, limited private-sector development and excessive dependence on public expenditure financed by hydrocarbon revenues. The challenge is therefore to move from project-based diversification to institutionally grounded diversification. This implies strengthening public investment management, improving transparency, supporting domestic firms, attracting non-extractive foreign investment and ensuring that public policies are aligned with long-term productive transformation.

1.4. Human Capital, Regional Integration and Comparative Perspectives

Human capital is a central condition for long-term diversification. Economies cannot move into higher value-added activities without technical skills, managerial capabilities, vocational training and a labour force adapted to the needs of emerging sectors. The World Bank (2025) stresses that Equatorial Guinea must strengthen human capital and improve the business environment in order to unlock new sources of diversified and inclusive growth. This is especially relevant for sectors such as agro-processing, fisheries, tourism, logistics, digital services and light manufacturing, all of which require skills that go beyond the traditional hydrocarbon economy. The mismatch between education systems and labour-market needs is a common obstacle in resource-dependent economies. When oil revenues dominate the economy, labour and talent tend to concentrate in the public sector and extractive activities, while non-oil sectors remain underdeveloped. As a result, productive diversification requires not only investment in infrastructure, but also reforms in education, technical training and entrepreneurship support. In Equatorial Guinea, building a skilled workforce will be essential to transform potential sectors into competitive industries.

Regional integration also offers an important opportunity. For a small economy such as Equatorial Guinea, the domestic market is not large enough to sustain diversified production at scale. Regional and continental markets can therefore expand opportunities for agriculture, fisheries, forestry products, tourism and services. The African Continental Free Trade Area provides a strategic framework for increasing intra-African trade and developing regional value chains. However, taking advantage of this opportunity requires improvements in trade logistics, customs procedures, standards, infrastructure and productive capacity.

Comparative experiences from other oil-dependent economies suggest that diversification is difficult when institutions remain weak, industrial policy is inconsistent and public investment is not linked to private-sector development. These experiences also show that local content policies, infrastructure investment and industrial strategies can support diversification only when they are accompanied by transparency, skills formation, market access and credible governance mechanisms. At the end of this review, the literature converges on a clear diagnosis: the transition from a hydrocarbon-dependent economy to a diversified economy requires more than the promotion of isolated sectors. It requires a comprehensive transformation of institutions, productive capabilities, human capital, infrastructure, governance and regional integration. In the case of Equatorial Guinea, diversification must therefore be understood as a long-term structural process aimed at reducing vulnerability, expanding the non-oil economy and building the foundations for sustainable and inclusive growth.

2. Methodology

This section presents the methodological strategy used to examine Equatorial Guinea's transition from a hydrocarbon-dependent economy toward a more diversified productive structure. The study combines descriptive, multivariate and econometric techniques. First, official macroeconomic and sectoral data are used to describe the evolution of the country's productive structure. Second, Principal Component Analysis (PCA) is applied to identify sectoral patterns and construct a composite economic diversification index. Third, Ordinary Least Squares (OLS) estimations are used to assess the relationship between selected non-oil sectors, economic growth and the external sector. The methodological design is consistent with the objective of the article: to analyse whether Equatorial Guinea has moved beyond its hydrocarbon-centred growth model and to evaluate the extent to which non-oil sectors contribute to growth and trade performance. This approach makes it possible to combine a structural interpretation of diversification with empirical evidence derived from sectoral data.

2.1. Data Sources

The study relies on secondary data from the National Institute of Statistics of Equatorial Guinea (INEGE). The dataset includes macroeconomic and sectoral indicators related to GDP, hydrocarbon activity, agriculture, fisheries, forestry, refinery and petroleum products, restaurants and hotels, construction, manufacturing industries, exports and imports. These variables are used to describe the structure of the Equatoguinean economy and to estimate the contribution of selected sectors to economic growth and the trade balance. INEGE produces national accounts statistics aimed at providing timely and reliable information for public institutions, private actors and other users. In particular, quarterly and annual national accounts provide estimates of Gross Domestic Product (GDP), one of the main indicators of national economic performance. The compilation of quarterly national accounts follows internationally recognized statistical principles, including those established in the IMF's Quarterly National Accounts Manual (International Monetary Fund, 2017).

The main period of analysis covers 2006–2025, which provides a long-term view of the country's economic trajectory before and after the decline in oil prices that began in 2014. For the external-sector model, the period is restricted to 2016–2023 due to the availability of export and import data. Although shorter, this second period is analytically relevant because it captures a phase in which the country faced declining hydrocarbon revenues and increasing pressure to promote alternative sources of growth. The data were processed and analysed using standard statistical and econometric tools, including XLSTAT, EViews and Stata. Descriptive statistics, graphs, PCA outputs and OLS estimations were used to examine trends, correlations and sectoral effects.

2.2. Analytical Framework

The empirical strategy is grounded in the literature on structural transformation, resource dependence and economic diversification. Structural transformation theory emphasizes the gradual reallocation of resources from low-productivity activities toward sectors with higher productivity and value added (Lewis, 1954; Chenery & Syrquin, 1975). In resource-dependent economies, however, this process may be constrained by the resource curse and Dutch disease, which can weaken non-extractive sectors and reinforce dependence on hydrocarbon rents (Auty, 1993; Corden & Neary, 1982; Sachs & Warner, 1995, 2001). The analysis also draws on the economic complexity perspective, which argues that diversification depends not only on the number of sectors in an economy, but also on the productive capabilities accumulated by a country (Hidalgo & Hausmann, 2009; Hausmann et al., 2014). From this perspective, Equatorial Guinea's diversification should be understood as a gradual process of capability-building in sectors that can complement or replace hydrocarbon-based growth.

Accordingly, the empirical analysis focuses on a set of sectors considered relevant for diversification: agriculture, fisheries, forestry, restaurants and hotels, refinery and petroleum products, and manufacturing industries. These sectors are selected because they capture different dimensions of the country's potential transition: primary production, natural-resource processing, services, tourism-related activity and industrial transformation.

2.3. Principal Component Analysis and the Economic Diversification Index

Principal Component Analysis (PCA) is used to reduce the dimensionality of the data and identify the main patterns of association among the selected economic sectors. PCA is appropriate for this study because it makes it possible to summarize information from several correlated variables into a smaller number of components while retaining most of the variance contained in the original dataset (Jolliffe, 2002). Let (X) represent the original data matrix, where each column corresponds to a sectoral variable and each row corresponds to a year of observation.

The variables included in the PCA are selected according to their relevance for the diversification process. After standardizing the variables, the PCA transformation can be expressed as:

$$\text{Centralization } X_c = X - \bar{X} \Rightarrow Z = 'X_c X_c \quad (1)$$

Where Z: represents the matrix of major components. X: represents the matrix of original data, formed by the four sectoral variables of this study: agriculture (AGR), fisheries (PES), tourism (TUR) and manufacturing (MAN). Each variable collects the evolution of this sector in Equatorial Guinea during the period analyzed, expressed as a percentage of GDP or in terms of its contribution to the total added value of the economy, according to the availability of official data from the National Institute of Statistics of Equatorial Guinea (INEGE). Each row of the X-matrix corresponds to one year of the study period, which extends from 2006 to 2025, allowing us to see how relations between economic sectors have evolved over time. Centralised symmetric matrix represents the variable cloud.

W: represents the eigenvector matrix, which is the one that defines the direction and weight of each original variable in each main component. Each component summarizes the information of the original variables, the first (PC1) being the one that explains the greatest variability and the second (PC2) the next largest. The variables that make up the X matrix were selected because they precisely represent the sectors that this work identifies as the pillars of Equatorial Guinea's future economic diversification. Agriculture (AGR) covers the production of the non-oil primary sector, including crops such as cocoa, coffee and food products. Fisheries (PES) covers both artisanal and industrial fishing activity, a sector with enormous potential given that Equatorial Guinea has an exclusive economic zone rich in marine resources. Tourism (TUR) covers income generated by the arrival of foreign visitors and tourism activity in general. And manufacturing (MAN) covers the development of the processing industry in the interior of the country, i.e. the ability to process raw materials locally and generate products with higher added value.

The indicators are standardized to make them comparable. Particular attention should be paid to extreme values, as they can influence the subsequent steps in the process of constructing a composite indicator. Composite indicators can be visualized or presented in a number of different ways, which can affect their interpretation (Greenacre and Blasius, 1994). In addition, the assessment and presumption of a level of diversification of the economy of Equatorial Guinea is made here through the construction of a composite diversification index based on the previously described ACP technique. The primary indicators here making up the composite standardization index are Subsistence Agriculture, Forestry, Fish Farming, Restaurants - Hotels and Refinery - Petroleum Products. In order to avoid a distribution in the positive and negative directions, having to face the difficulties of appreciation, a standardization technique is implemented from the following formula:

Equatorial Guinea Standardized Composite Index of Economic Diversification

$$Diversification_norm = \left[\left(Diversification - r(min) \right) / \left(r(max) - r(min) \right) \right]$$

where normalized diversification index over the interval [0; 1] where a trend towards 0 gives rise to the presumption of absence of economic diversification. On the contrary, where the trend is towards 1 gives rise to the presumption of strong diversification. The chosen study period, from 2006 to 2025, provides a complete view of almost two decades of evolution, or nineteen years.

The study period chosen, from 2006 to 2025, provides a comprehensive view of almost two decades of economic development, identifying trends and guiding the diversification policies that Equatorial Guinea urgently needs to implement.

$$g_t = \beta_0 + \beta_1 AGR_t + \beta_2 PES_t + \beta_3 TUR_t + \beta_4 MAN_t + \varepsilon_t \quad (3)$$

Where: g_t is the growth rate of GDP per capita of Equatorial Guinea in year t (dependent variable); AGR_t is the value of agriculture in year t , expressed as a percentage of GDP or in terms of its contribution to the total value added of the economy; PES_t is the value of fish farming in year t , expressed in the same terms as the previous variable (this variable covers both artisanal and industrial fishing activity in Equatorial Guinea); TUR_t is the value of tourism in year t , measured through the income generated by the arrival of foreign visitors and tourism activity in general; MAN_t is the value of manufacturing in year t , which covers the development of the processing industry within the country, i.e. the ability to process raw materials locally and generate higher value-added products before exporting them. β_0 : is the constant of the model, that is to say the value that the growth rate of GDP per capita would take if all the sectors included in the model had a value equal to zero. $\beta_1, \beta_2, \beta_3, \beta_4$: are the coefficients of the model, which measure the effect of each sector on the economic growth of the country. This is the random error term of year t . It includes all the factors that affect the economic growth of Equatorial Guinea but are not included in the model. In this model, economic growth is measured through the change in GDP per capita over time, which makes it possible to analyze how different productive sectors, such as agriculture, fisheries, tourism and manufacturing, influence the evolution of the country's economy.

Following INEGE's approach, economic growth in GDP per capita is achieved as:

$$g_t = \frac{PIB_{pct} - PIB_{pct-1}}{PIB_{pct-1}} \quad (4)$$

Alternatively, equation (3) could also be presented with in turn the endogenous variable oil GDP growth and the current account balance (Broni-Bediako et al, 2018 approach).

2.4. OLS Model for Economic Growth

Following the approach of Broni-Bediako et al (2018), the period of analysis of this second model covers the years from 2016 to 2023, as the data available on exports and imports in the INEGE database covers only this time interval. Although this period is shorter than that of the first Model 3, it is particularly relevant because it coincides with a stage of significant changes in the country's economy, marked by the prolonged fall in oil prices that began in 2014 and the government's first efforts to promote alternative sectors. The variable dependent on this second model is the trade balance, which represents Equatorial Guinea's external sector, and is calculated as follows:

$$BC_t = EXP_t - IMP_t$$

(5) Where BC_t represents the trade balance in year t ; EXP_t , the country's exports in year t and the country's total imports in year t . as in equation (3), the independent variables remain the same, including AGR , PES , TUR and MAN . As a result, the difference in analysis between the model (6) following and that in (3) is based on endogenous variables. That of equation (6) is called BC , understood as Commercial Balance (BC_t).

$$BC_t = \beta_0 + \beta_1 AGR_t + \beta_2 PES_t + \beta_3 TUR_t + \beta_4 MAN_t + \varepsilon_t \quad 6)$$

The estimation techniques of the economic models used here (including 3 and 6) are ordinary least squares. The data IS obtained from INEGE.

3. Presentation and Analysis of Results

This section presents the empirical results of the study. The analysis is organized in three stages. First, descriptive statistics are examined in order to identify the general structure of the Equatoguinean economy over the period under study. Second, Principal Component Analysis (PCA) is used to explore the relationships between hydrocarbon-related indicators and selected non-oil sectors. Third, a composite Economic Diversification Index (EDI) is constructed and complemented with OLS estimations to assess the association between selected sectors, GDP and the trade balance. The results should be interpreted in light of the structural characteristics of Equatorial Guinea's economy. During the period analysed, the country remained strongly influenced by hydrocarbon activity, although recent years show signs of a gradual movement toward non-oil sectors. The empirical analysis therefore seeks to determine whether this apparent shift represents a meaningful diversification process or only a limited reconfiguration within a still hydrocarbon-centred economy.

3.1. Descriptive Statistics

Before presenting the PCA and econometric results, it is necessary to examine the descriptive profile of the variables included in the study. Table 1 summarizes the main statistical properties of the variables used in the analysis, including GDP at constant market prices, oil GDP, subsistence agriculture, fisheries, forestry, refinery and petroleum products, restaurants and hotels, construction, taxes and subsidies, and other manufacturing industries. The table reports the mean, median, maximum, minimum, standard deviation, skewness, kurtosis, Jarque-Bera statistic, probability values, sum, sum of squared deviations and number of observations.

Table 1. Descriptive statistics of selected economic variables, 2006–2025

	Subsistence farming	GDP at Constant Market Prices	GDP including oil Fish Farming	Refinery Petroleum products	Restaurants Hotels	Forestry	Taxes, subsidies	Construction	Other manufacturing industries	
Mean	71.59974	5989.450	3565.300	12.09740	1247.879	24.30899	15.42866	20.63917	393.7307	182.7360
mean	74.49632	5910.000	3781.000	11.82148	1330.559	22.86371	12.33600	25.17023	295.3986	195.1283
Maximum	94.57904	7627.000	5193.000	16.45753	1554.946	32.77400	32.14400	42.91421	972.6530	245.7993
Minimum	44.61537	4751.000	2039.000	8.337000	321.4960	16.33483	2.246000	-14.67700	120.0131	71.97100
Tearing Strength										
Par. Curr.	17.15848	1046.467	1004.879	2.714539	283.9954	4.488900	9.324847	15.33921	287.3633	54.71029
SKEWNESS	-0.249252	0.198646	-0.122539	0.346255	-1.925731	0.511195	0.566275	-0.908787	0.746388	-0.856161
kurtosis	1.754618	1.441671	1.607944	1.896365	6.876942	2.359717	1.999903	3.143497	2.144698	2.479091
Jarque-Bera	1.499569	2.155193	1.664901	1.414648	24.88703	1.212703	1.902388	2.770139	2.466602	2.669495
Probability	0.472468	0.340413	0.434982	0.492961	0.00004	0.545337	0.386280	0.250306	0.291329	0.263225
SUM	1431.995	119789.0	71306.00	241.9479	24957.58	486.1798	308.5731	412.7835	7874.615	3654.720
Sum Sq. Dev.	5593.856	20806787	19185854	140.0058	1532415.	382.8542	1652.102	4470.537	1568976.	56871.11
OBSERVATIONS	20	20	20	20	20	20	20	20	20	20

Source: Authors' calculations based on INEGE data using EViews 10.

Table 1 provides an initial overview of the structure of the Equatoguinean economy during the period analysed. The descriptive results confirm the dominant role of hydrocarbon-related activity. GDP at constant market prices records the highest average value, followed by oil GDP and refinery and petroleum products. This confirms that, throughout the period under study, the structure of the economy remained strongly concentrated around oil-related production and processing.

Construction and other manufacturing industries occupy an intermediate position, while agriculture, fisheries, forestry and restaurants and hotels show substantially lower average values. This suggests that non-oil sectors remain relatively weak when compared with hydrocarbon-related activities. Agriculture, fisheries and forestry, despite their potential contribution to diversification, continue to represent a limited share of the overall productive structure. Similarly, restaurants and hotels, used here as a proxy for tourism-related activity, remain modest in scale. The descriptive statistics therefore provide a first indication that Equatorial Guinea's diversification process remains incomplete. The central empirical issue is not whether non-oil sectors exist, but whether they have acquired sufficient weight and dynamism to alter the country's hydrocarbon-dependent development pattern. At the same time, the dispersion of the variables indicates that some sectors have experienced greater volatility than others. Construction and refinery-related activities display relatively high variation, reflecting their sensitivity to public investment cycles and hydrocarbon dynamics. By contrast, fisheries, restaurants and hotels, and agriculture show lower absolute variation, which may indicate both limited expansion and weak structural transformation over time.

Taken together, these results establish the empirical background for the PCA and econometric analysis. They show an economy still dominated by oil-related indicators, but with some emerging signs of sectoral movement that require deeper examination.

3.2. Analysis of Economic Diversification in Equatorial Guinea

The first stage of the multivariate analysis relies on Principal Component Analysis to identify the relationships among the selected economic indicators.

The principal components analysis conducted aims to identify the sub-dimensions contributing most to the variability of diversification economic in Equatorial Guinea. As illustrated in Table 2, only the first three components have eigenvalues greater than 1, suggesting that they can reliably explain fragility in Africa. Collectively, these two components account for 81,02% of the total inertia or information. Table 2 shows the eigenvalues of the thirteen components obtained and the percentage of variance explained by each. According to Kaiser's criteria, components with eigenvalues greater than 1 are retained as significant; in this analysis, these are F1, F2 and F3.

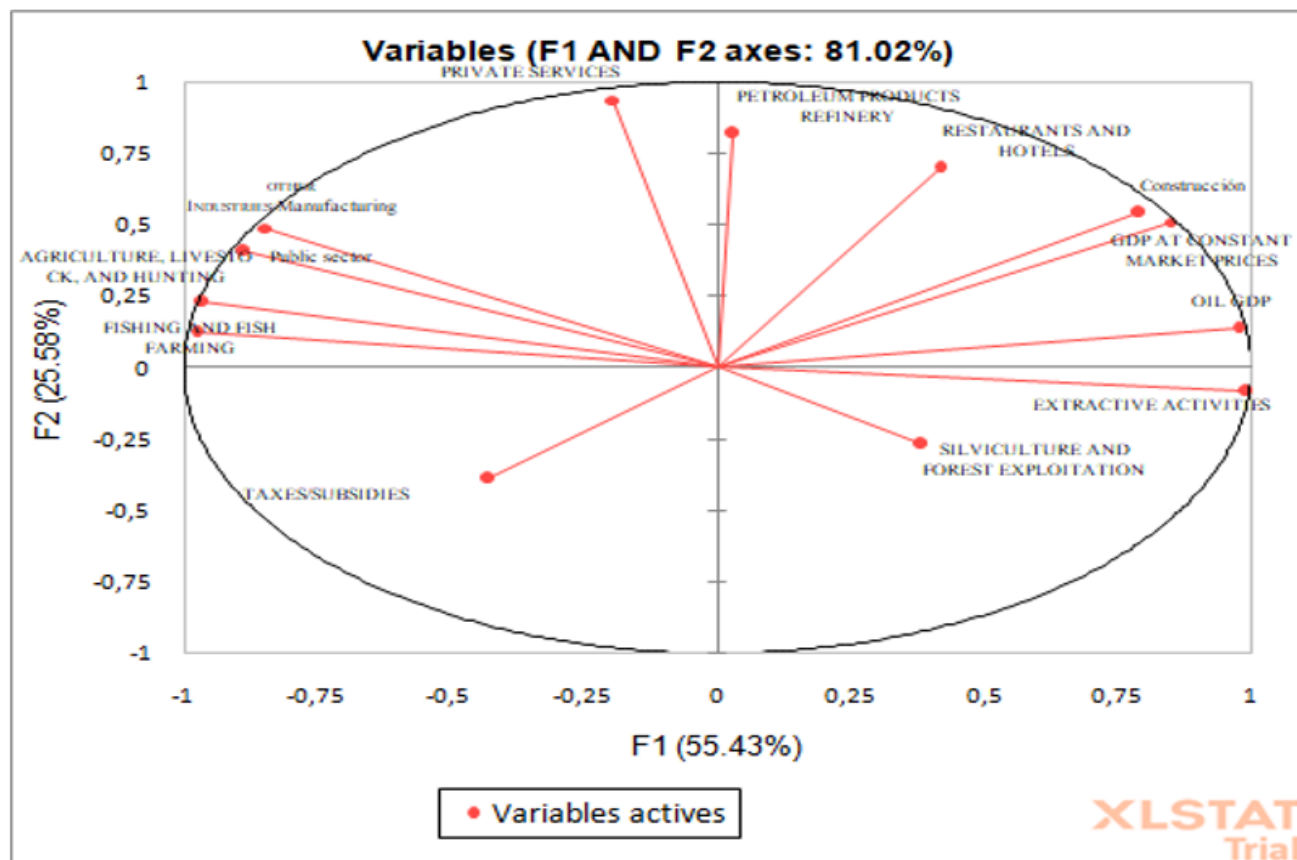
Table 2: Eigen values and explained variance for Principal Component Analysis

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
Eigen value	7,207	3,326	1,261	0,705	0,248	0,118	0,064	0,031	0,022	0,016	0,001	0,001	0,000
Variability (%)	55,43	25,58											
	5	4	9,700	5,423	1,906	0,911	0,494	0,236	0,169	0,123	0,011	0,007	0,001
%	55,43	81,01	90,71	96,14	98,04	98,95	99,45	99,68	99,85	99,98	99,99	99,99	100,0
Accumulation	5	9	9	2	8	9	3	9	7	1	2	9	0

Source: calculations by the authors based on data from INEGE, EVIEWS 10 and XLSTAT

Figure 1 presents the correlation circle of the variables included in the PCA. This figure is useful because it shows how the main indicators are positioned in relation to the first two principal components and whether they move in similar or opposite directions.

Figure 1. PCA correlation circle of selected economic indicators



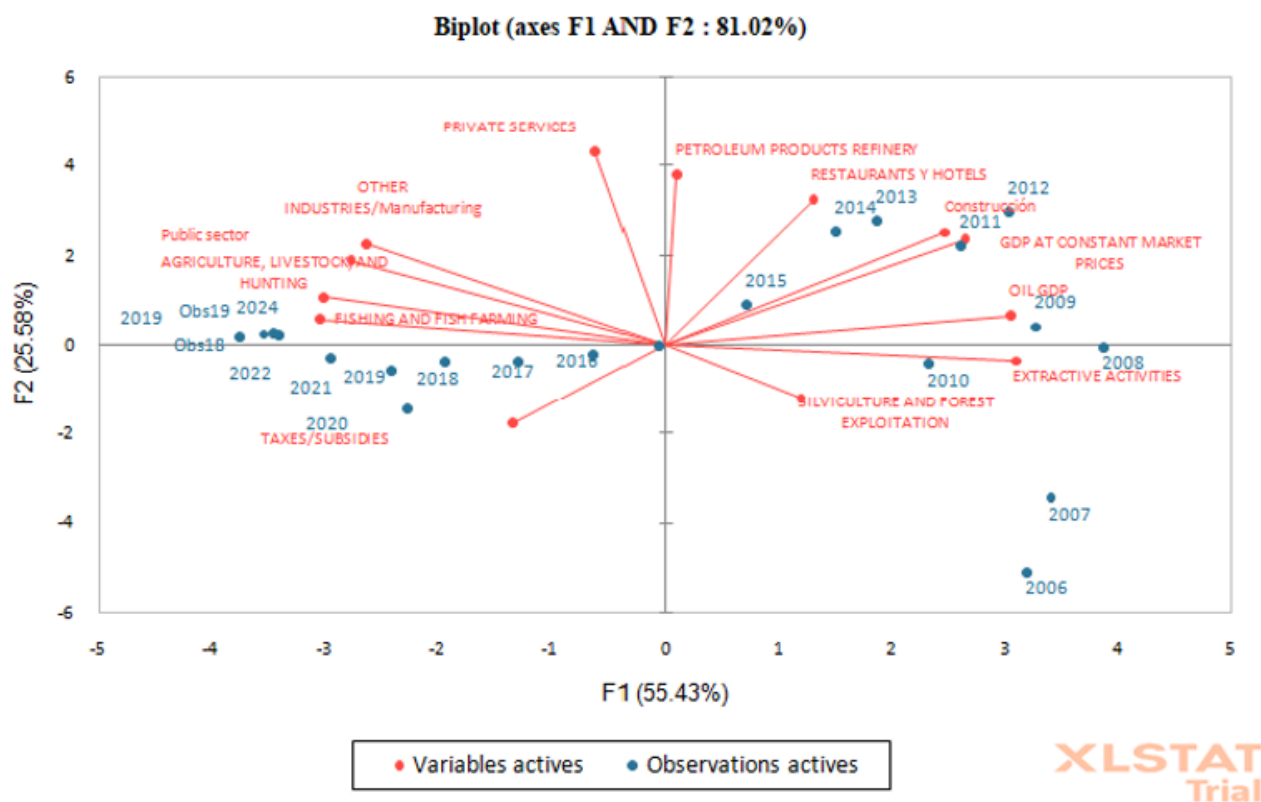
Source: Authors' calculations based on INEGE data using EViews 10 and XLSTAT.

Figure 1 shows that the first two principal components explain 81.02% of the total variance, with the first component accounting for 55.43% and the second for 25.58%. This level of explained variance is sufficiently high to support a meaningful interpretation of the sectoral structure. The correlation circle reveals two broad groups of variables. The first group is associated with hydrocarbon-centred activity, including oil GDP, GDP at market prices and extractive-related indicators. These variables move in the same direction, which suggests a strong internal association among the main indicators of the oil-based economy. Their location close to the unit circle indicates that they are well represented by the first two principal components.

The second group includes variables more closely associated with diversification, such as agriculture, fisheries and other manufacturing industries. These variables also show a positive internal association, but they are positioned in the opposite direction from the hydrocarbon-related group. This opposition suggests a negative relationship between the oil-centred structure and the emerging non-oil sectors. In other words, the PCA indicates that the expansion of diversification-related sectors does not occur in the same direction as the hydrocarbon economy. This result is analytically important because it supports the idea of a structural tension between hydrocarbon dependence and economic diversification. The first principal component can therefore be interpreted as an axis opposing the oil-centred model to a more diversified productive structure. The internal coherence of each group, combined with the opposition between them, suggests that Equatorial Guinea's economy is undergoing a partial reorientation, although this process remains fragile and uneven.

To complement the interpretation of the correlation circle, Figure 2 incorporates the yearly observations into the PCA space. This figure makes it possible to observe the temporal distribution of the economy and to identify whether specific years are closer to the oil-centred group or to diversification-related sectors.

Figure 2. PCA biplot of selected indicators and yearly observations



Source: Authors' calculations based on INEGE data using EViews 10 and XLSTAT.

Figure 2 suggests a temporal separation between the oil-boom period and more recent years. The years 2008 and 2009 are located closer to the hydrocarbon-related indicators, reflecting the period in which oil activity played a particularly central role in the country's economic performance. By contrast, recent years—especially 2022, 2023, 2024 and 2025—are located closer to agriculture, fisheries and other manufacturing indicators.

This temporal pattern suggests that the economy has gradually moved away from the strongest phase of oil-centred expansion and toward a configuration in which non-oil sectors are becoming more visible. However, this should not be interpreted as evidence of full diversification. Rather, it indicates an incipient and partial diversification process, driven partly by the decline of hydrocarbon production and partly by the gradual emergence of alternative sectors. The year 2015 appears as an atypical observation, which is consistent with the macroeconomic shock generated by the decline in international oil prices. Its position in the PCA space reflects the disruptive effect of the oil crisis on the structure of the economy. This reinforces the argument that Equatorial Guinea's diversification efforts cannot be understood independently of the volatility and decline of the hydrocarbon sector.

Overall, the PCA results partially support the first hypothesis. Agriculture and fisheries appear negatively associated with oil-related variables, which is consistent with the expected opposition between diversification sectors and the hydrocarbon economy. However, the relationship between tourism-related activity and the rest of the diversification group is less clear. Since restaurants and hotels are only an indirect proxy for tourism, their interpretation should be approached with caution. The first hypothesis is therefore only partially confirmed.

3.3. Construction of the Economic Diversification Index

The second stage of the empirical analysis consists of constructing a composite Economic Diversification Index. The index is based on selected indicators that reflect the contribution of key sectors to Equatorial Guinea's productive structure. These include subsistence agriculture, forestry, fisheries, restaurants and hotels, and refinery and petroleum products. The purpose of the index is to provide a synthetic measure of the evolution of diversification over time. Because the original PCA scores may contain both positive and negative values, the index is normalized on a scale from 0 to 1. Values close to 0 indicate a low level of diversification, while values close to 1 indicate a higher level of diversification. This normalization allows the index to be interpreted more clearly and facilitates comparison across years.

Table 3 presents the descriptive results of the Economic Diversification Index. It reports the number of observations, mean, standard deviation, minimum and maximum values.

Table 3. Economic Diversification Index for Equatorial Guinea

Variable	Observations	Mean	Tearing Strength Par. Curr.	Min	Max
Economic diversification index (EDI).	21	0.5207284	0.3825161	0	1

Source: Authors' calculations based on INEGE data using Stata 12.

Table 3 shows that the average value of the Economic Diversification Index is 0.5207, equivalent to 52.07%. This result suggests an intermediate level of diversification. In other words, Equatorial Guinea cannot be described as a fully diversified economy, but neither does the index indicate a complete absence of diversification. The country appears to occupy an intermediate position, marked by gradual movement toward non-oil activities but still constrained by the structural weight of hydrocarbons. The standard deviation of the index is relatively high, which suggests important fluctuations across the period. This is consistent with the country's exposure to oil price cycles, changes in public investment and uneven sectoral performance. The minimum value of 0 and maximum value of 1 indicate that the index captures a wide range of variation, from years of very low diversification to years in which non-oil sectors acquired greater relative importance.

These results should be interpreted carefully. A diversification index above 50% does not mean that the economy is already structurally diversified in a deep or sustainable way. Rather, it indicates that, within the set of variables included in the analysis, there is evidence of a moderate shift toward a more diversified productive composition.

The result is consistent with the PCA findings, which show that recent years are more closely associated with non-oil sectors than with the peak years of the oil boom. Therefore, the Economic Diversification Index confirms the existence of a gradual but incomplete diversification process. Equatorial Guinea has begun to move away from an exclusively oil-centred configuration, but the transformation remains limited and requires stronger sectoral policies, institutional coordination, private investment and human-capital development.

3.4. Sectoral Effects on GDP and the Trade Balance

The final stage of the empirical analysis examines the relationship between selected sectors and three dependent variables: GDP at constant market prices, oil GDP and the trade balance. Table 4 presents the OLS estimates. The explanatory variables include subsistence agriculture, fisheries, forestry, refinery and petroleum products, restaurants and hotels, private services, and taxes and subsidies. Before interpreting the results, it is important to note that these estimates should be read as exploratory associations rather than definitive causal effects. This is particularly relevant because the number of observations is limited, especially in the model using the trade balance as the dependent variable. Nevertheless, the results provide useful evidence on the extent to which selected sectors are associated with the country's economic performance and external position.

Table 4 OLS estimates of sectoral effects on GDP, oil GDP and the trade balance

TAGS	(1) GDP at Constant Market Prices	(2) Log(Oil GDP)	(3) Log(Export_Import)
Subsistence farming	-0.007675** (0.073678)	-009 003	0.867604*** (0.008827)
Fish Farming	002212## (0.013174)	-0.04 (023)	-2.919987*** (0.029259)
Forestry	0.000405*** (0.001015)	0.002 002	0.049531** (0.001784)
Refinery Petroleum products	0.000186*** (3.96E-05)	0002 (6.95E-05)	##001372## (5.28E-05)
Restaurants Hotels	0.011986*** (0.002413)	0.0076 004	-0.390751*** (0.004535)
Private services	0.000398*** (0.000128)	0.0002 (0.0002)	- -
Taxes, subsidies	##000352## (0.000592)	00064 +0.001	0.101489*** ##000880##
Constantly	8.402333*** (0.073678)	8.6519*** 129.	-15.24878*** (0.235935)
Comments	20	20	08
R2	0.985809	0.9853	0.999987

Source: Authors' calculations based on INEGE data using EViews 10 and Stata 12.

Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 4 shows differentiated effects across sectors. Agriculture is negatively associated with GDP at constant market prices and oil GDP, while it is positively associated with the trade balance. This result suggests that agriculture has not yet become a strong driver of domestic economic growth, despite its potential role in diversification. Its positive association with the trade balance may reflect the importance of food-related trade flows and the country's dependence on imported agricultural products. Therefore, agriculture remains a strategic but underdeveloped sector.

Fisheries also show mixed results. While the sector is included as one of the potential pillars of diversification, its estimated relationship with the trade balance is negative.

This may indicate that fisheries and aquaculture have not yet generated sufficient export capacity or domestic value addition to improve the external position. The result suggests the need to strengthen local processing, cold-chain infrastructure, port logistics and sectoral governance if fisheries are to contribute meaningfully to diversification. Forestry is positively associated with GDP and the trade balance. This finding suggests that forestry may represent one of the more promising sectors for diversification, particularly if the country moves beyond raw-resource extraction toward sustainable forest management and local processing. However, the long-term contribution of forestry depends on environmental governance, certification, value-added transformation and the prevention of unsustainable extraction.

Refinery and petroleum products show a positive association with GDP. This result is expected, given the continued centrality of hydrocarbon-related activities in the country's productive structure. However, it also reveals a conceptual limitation of the diversification process: part of the measured diversification still remains linked to the hydrocarbon value chain. Therefore, although refinery activity may increase value added, it does not necessarily imply a transition away from oil dependence. Restaurants and hotels are positively associated with GDP but negatively associated with the trade balance. This suggests that tourism-related activity may contribute to domestic output but has not yet generated a strong external-sector effect. The negative association with the trade balance may reflect the import content of tourism-related services, limited international tourism inflows, or the weak development of a competitive tourism export sector. Since restaurants and hotels are used as a proxy, these results must be interpreted with caution.

Private services are positively associated with GDP, indicating that services may play a complementary role in the country's economic transformation. However, the available data do not allow a more precise assessment of the types of services driving this result. Future research should distinguish between financial services, public services, transport, digital services and business services in order to better understand the role of the tertiary sector in diversification. Taken together, the OLS results only partially support the second hypothesis. The expectation that agriculture, fisheries, tourism and manufacturing would have a positive effect on growth is not fully confirmed. Some sectors show positive associations with GDP, but others show negative or ambiguous effects. The results therefore suggest that diversification sectors are not yet sufficiently developed to operate as strong and consistent engines of growth.

This finding is important for the overall argument of the article. Equatorial Guinea's diversification process appears to be underway, but it remains shallow, uneven and partly dependent on oil-related activities. The empirical evidence shows an economy in transition, but not yet a structurally diversified economy. The challenge is therefore not merely to promote non-oil sectors, but to strengthen their productivity, export capacity, institutional support and integration into domestic and regional value chains.

4. Discussion: Economic Diversification and Equatorial Guinea's Integration into the Global Economy

The empirical results presented in the previous section provide a nuanced interpretation of Equatorial Guinea's diversification process. The construction of the Economic Diversification Index (EDI) shows an average value of 52.07%, which suggests an intermediate level of diversification. This finding is relevant because it indicates that the economy is no longer exclusively organized around the peak dynamics of the oil boom. However, it should not be interpreted as evidence of a consolidated structural transformation.

Rather, it reveals a transitional and still fragile pattern in which non-oil sectors have become more visible, but have not yet acquired the productive strength, export capacity or institutional support required to replace hydrocarbons as the main engine of growth. This finding is consistent with the first objective of the study, which sought to identify and analyse the structural and institutional factors shaping economic diversification in Equatorial Guinea. The results show that diversification is constrained by the persistent weight of the hydrocarbon sector, the limited scale of non-oil productive activities and the weak articulation among agriculture, fisheries, forestry, tourism and manufacturing. The PCA results are particularly useful in this regard. They reveal a clear opposition between hydrocarbon-related indicators and diversification-related sectors, suggesting that the movement toward non-oil activities is not simply an extension of the oil-based model, but a partial reconfiguration of the productive structure. This supports the idea that Equatorial Guinea is undergoing a process of sectoral adjustment, although not yet a deep transformation.

The first hypothesis is therefore partially confirmed. Agriculture and fisheries appear negatively associated with hydrocarbon-related variables, which is consistent with the expected structural opposition between the oil economy and emerging diversification sectors. Nevertheless, the evidence is less conclusive for tourism-related activity, proxied by restaurants and hotels. This sector does not appear as clearly integrated into the diversification group, which may reflect both measurement limitations and the still weak development of tourism as an internationally competitive sector. Consequently, the first hypothesis is supported in relation to the opposition between oil and selected non-oil sectors, but only partially validated with respect to the broader configuration of diversification.

The second objective of the study was to assess the contribution of selected non-oil sectors to economic growth and the trade balance. The OLS results show that the effects of these sectors are heterogeneous. Forestry, refinery and petroleum products, restaurants and hotels, and private services display positive associations with GDP, while agriculture shows a negative association with GDP at constant market prices and oil GDP. Fisheries also present mixed results, particularly in relation to the trade balance. These findings suggest that the expected contribution of diversification sectors to growth is neither uniform nor sufficiently consolidated. The second hypothesis is therefore only partially confirmed. The assumption that agriculture, fisheries, tourism and manufacturing would exert a positive effect on economic growth is not fully supported by the empirical evidence. Some sectors contribute positively to GDP, but others show weak, negative or ambiguous associations. This does not invalidate the strategic relevance of diversification; rather, it indicates that the sectors identified as potential drivers of transformation have not yet reached the level of productivity, investment, institutional support or market integration necessary to operate as robust engines of growth.

This result is consistent with the broader diagnosis advanced by recent institutional assessments. The International Monetary Fund (2025) argues that Equatorial Guinea faces the challenge of replacing diminishing natural resource wealth with a diversified and inclusive economy, while the World Bank (2025) stresses the need to build the foundations for renewed, more diversified and inclusive growth. The African Development Bank (2025) also emphasizes that the country's macroeconomic outlook remains vulnerable to the expected decline in hydrocarbon export revenues. These assessments reinforce the interpretation developed in this article: diversification is no longer only a desirable policy option, but a structural necessity.

The implications for Equatorial Guinea's insertion into the global economy are significant. A diversification index slightly above 50% may indicate a movement away from extreme hydrocarbon concentration, but it does not automatically improve international

competitiveness. For diversification to strengthen the country's global economic position, non-oil sectors must generate value added, exports, employment and productive linkages. At present, the evidence suggests that Equatorial Guinea remains inserted into the world economy primarily through hydrocarbons, while its non-oil sectors remain insufficiently developed to support a more balanced external integration. In this sense, diversification should not be understood merely as the statistical expansion of non-oil sectors. It must be conceived as a broader process of productive upgrading, institutional reform and capability-building. Agriculture can contribute to food security and rural employment, but only if it is supported by infrastructure, financing, land policy, technical assistance and agro-industrial value chains. Fisheries may become a strategic sector if the country invests in port logistics, cold-chain systems, processing capacity and sustainable resource governance. Forestry can contribute to diversification if it moves beyond raw extraction toward certification, local transformation and environmental sustainability. Tourism can provide foreign exchange and employment, but only if supported by connectivity, infrastructure, professional training and a coherent national tourism strategy.

The results also show that part of the apparent diversification remains linked to the hydrocarbon value chain, particularly through refinery and petroleum products. This is important because oil-related downstream activities may increase domestic value added, but they do not necessarily reduce structural dependence on hydrocarbons. In other words, diversification within the oil sector is not equivalent to diversification away from oil. For Equatorial Guinea, the central challenge is therefore to develop non-hydrocarbon sectors capable of sustaining growth beyond the decline of oil production.

From a policy perspective, the findings point to the need for a more integrated diversification strategy. Sectoral promotion alone is insufficient. The country needs stronger institutions, better public investment management, human-capital development, private-sector support and improved integration into regional and international markets. This is consistent with UNCTAD's argument that commodity-dependent developing countries require technological upgrading, innovation and stronger productive capabilities to escape the commodity dependence trap (UNCTAD, 2021). It is also consistent with the World Bank's emphasis on the need to improve the business environment, strengthen human capital and support private-sector-led growth in Equatorial Guinea (World Bank, 2025).

Regional integration may also become an important lever. The African Continental Free Trade Area can expand opportunities for non-oil exports, but these opportunities will only be effective if domestic firms are able to meet standards, increase productivity and participate in regional value chains. Therefore, diversification must be understood as an outward-oriented process that connects domestic productive transformation with regional and global markets. Overall, the discussion confirms the central argument of the article: Equatorial Guinea has begun a process of economic diversification, but this process remains incomplete, uneven and institutionally fragile. The empirical evidence shows signs of transition, but not yet a consolidated post-hydrocarbon development model. The challenge is no longer simply to recognize the need for diversification; it is to transform diversification into a coherent, sustainable and inclusive development strategy.

Conclusion

This article examined Equatorial Guinea's transition from a hydrocarbon-dependent economy toward a more diversified productive structure. The study was motivated by a central paradox: despite two decades of substantial oil revenues and its classification as an upper-middle-income country, Equatorial Guinea has struggled to convert hydrocarbon wealth into a broad-based, resilient and inclusive development model.

The persistence of oil dependence, the limited weight of non-oil sectors and the vulnerability of the economy to external shocks reveal the structural limits of a development strategy centred on extractive rents. The first objective of the study was to identify and analyse the structural and institutional factors that condition economic diversification in Equatorial Guinea. This objective was achieved through the review of the literature and the empirical analysis of the country's productive structure. The findings show that diversification is constrained by the continued dominance of hydrocarbons, weak non-oil productive capabilities, limited private-sector development and insufficient integration among agriculture, fisheries, forestry, tourism and manufacturing. These results confirm that diversification is not only a sectoral challenge, but also an institutional and structural one.

The second objective was to empirically assess the contribution of selected non-oil sectors to economic growth and the trade balance. This objective was addressed through PCA, the construction of a composite Economic Diversification Index and OLS estimations. The PCA results reveal a clear opposition between hydrocarbon-related variables and diversification-related sectors, while the Economic Diversification Index shows an average value of 52.07%. This suggests an intermediate level of diversification: the economy has begun to move beyond the strongest phase of oil-centred expansion, but it has not yet achieved a deep and sustainable transformation.

The hypotheses of the study are also partially confirmed. The first hypothesis, which expected a negative relationship between hydrocarbon-related activity and diversification sectors such as agriculture and fisheries, is supported by the PCA results. These sectors are positioned in opposition to the oil-centred group, suggesting a gradual process of sectoral reallocation. However, the evidence is less conclusive for tourism-related activity, which remains difficult to interpret because restaurants and hotels are only an indirect proxy for tourism. The first hypothesis is therefore partially validated.

The second hypothesis, which expected agriculture, fisheries, tourism and manufacturing to have a positive effect on economic growth, is also only partially confirmed. The OLS results show positive associations for some sectors, such as forestry, refinery and petroleum products, restaurants and hotels, and private services. However, agriculture shows a negative association with GDP, and fisheries present mixed results, particularly in relation to the trade balance. These findings indicate that non-oil sectors have not yet become consistent and powerful drivers of economic growth. Their potential is real, but their current contribution remains limited and uneven.

The main contribution of this article is to show that Equatorial Guinea's diversification process should be understood as an incomplete transition rather than a consolidated transformation. The country is no longer located exclusively in the logic of the oil boom, but it has not yet built a productive structure capable of sustaining growth beyond hydrocarbons. The average diversification index of 52.07% captures this intermediate position: it reflects movement, but not maturity; transition, but not consolidation. These findings are consistent with the current diagnosis of Equatorial Guinea's development challenges. The IMF (2025) notes that the country has a shrinking window of opportunity to accelerate non-hydrocarbon growth as hydrocarbon output continues to decline. Similarly, the World Bank (2025) frames diversification as central to renewed and inclusive growth, while the African Development Bank (2025) identifies the decline in hydrocarbon export revenues as a key source of macroeconomic vulnerability. In this context, the results of this study reinforce the urgency of moving from diversification discourse to diversification implementation.

The policy implications are clear. First, Equatorial Guinea must distinguish between diversification within the hydrocarbon value chain and diversification away from hydrocarbons. Refinery and petroleum-related activities may increase domestic value added, but they do not eliminate dependence on oil. Second, the country needs to strengthen non-oil sectors through coherent public policies, infrastructure, financing, technical training, business development and institutional coordination. Third, diversification must be linked to human-capital formation, private-sector growth and regional market integration. Without these conditions, agriculture, fisheries, forestry, tourism and manufacturing will remain potential sectors rather than engines of transformation.

Ultimately, the transition from a hydrocarbon-dependent economy to a diversified economy requires more than political discourse or isolated sectoral projects. It requires a long-term development strategy capable of converting resource wealth into productive capabilities, institutional strength and inclusive growth. Equatorial Guinea still has an opportunity to use the remaining benefits of its hydrocarbon economy to build the foundations of a post-oil development model. However, this window is narrowing as production declines and external vulnerabilities persist.

The future of Equatorial Guinea will depend on its capacity to transform diversification from an aspiration into an institutionalized development path. If the country manages to strengthen non-oil sectors, improve governance, invest in human capital and integrate more effectively into regional and global markets, diversification can become a genuine lever for sustainable development. If not, the economy will remain exposed to the structural fragility of hydrocarbon dependence. The evidence presented in this article therefore points to a clear conclusion: Equatorial Guinea has begun the transition, but the decisive task is still ahead.

Referencias

- African Development Bank. (2025). Equatorial Guinea economic outlook. African Development Bank.
- Auty, R. M. (1993). Sustaining development in mineral economies: The resource curse thesis. Routledge.
- Chenery, H., & Syrquin, M. (1975). Patterns of development, 1950–1970. Oxford University Press.
- Corden, W. M., & Neary, J. P. (1982). Booming sector and de-industrialisation in a small open economy. *The Economic Journal*, 92(368), 825–848. <https://doi.org/10.2307/2232670>
- Greenacre, M. et Blasius, J. (1994), « Correspondence analysis in the social sciences », London : Academic Press, p 370.
- Hausmann, R., Hidalgo, C. A., Bustos, S., Coscia, M., Simoes, A., & Yildirim, M. A. (2014). The atlas of economic complexity: Mapping paths to prosperity. MIT Press.
- Hotelling, H. (1933). Analysis of a Complex of Statistical Variables into Principal Components. *Journal of Educational Psychology*, 24(6), 417–441.
- Hidalgo, C. A., & Hausmann, R. (2009). The building blocks of economic complexity. *Proceedings of the National Academy of Sciences*, 106(26), 10570–10575. <https://doi.org/10.1073/pnas.0900943106>
- Hirschman, A. O. (1958). The strategy of economic development. Yale University Press.
- International Monetary Fund. (2017). Quarterly national accounts manual: 2017 edition. International Monetary Fund.
- International Monetary Fund. (2025). Republic of Equatorial Guinea: Staff report for the 2025 Article IV consultation and first and second reviews under the Staff-Monitored Program—Press release; staff report; and statement by the Executive Director for the Republic of Equatorial
- Guinea (IMF Country Report No. 25/224). International Monetary Fund. <https://doi.org/10.5089/9798229016742.002>
- Jolliffe, I. T. (2002). Principal component analysis (2nd ed.). Springer.
- Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The Manchester School*, 22(2), 139–191. <https://doi.org/10.1111/j.1467-9957.1954.tb00021.x>
- Lin, J. Y. (2012). New structural economics: A framework for rethinking development and policy. World Bank.
- Rodrik, D. (2004). Industrial policy for the twenty-first century. Harvard University.
- Rodrik, D. (2007). One economics, many recipes: Globalization, institutions, and economic growth. Princeton University Press.
- Ross, M. L. (2012). The oil curse: How petroleum wealth shapes the development of nations. Princeton University Press.
- Sachs, J. D., & Warner, A. M. (1995). Natural resource abundance and economic growth (NBER Working Paper No. 5398). National Bureau of Economic Research.
- Sachs, J. D., & Warner, A. M. (2001). The curse of natural resources. *European Economic Review*, 45(4–6), 827–838. [https://doi.org/10.1016/S0014-2921\(01\)00125-8](https://doi.org/10.1016/S0014-2921(01)00125-8)
- United Nations Conference on Trade and Development. (2021). Commodities and development report 2021: Escaping from the commodity dependence trap through technology and innovation. United Nations.

Referencias

- United Nations Conference on Trade and Development. (2023). Commodities and development report 2023: Inclusive diversification and energy transition. United Nations.
- Van der Ploeg, F. (2011). Natural resources: Curse or blessing? *Journal of Economic Literature*, 49(2), 366–420. <https://doi.org/10.1257/jel.49.2.366>
- World Bank. (2024). Equatorial Guinea digital economy country diagnostic: Bridging the gaps to develop a safe and inclusive digital transformation. World Bank.
- World Bank. (2025). Equatorial Guinea country economic memorandum: Building the foundations for renewed, more diversified and inclusive growth. World Bank.