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Potential sources of income inequality in the West African Economic and Monetary Union (WAEMU) countries

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Potential sources of income inequality in the West African Economic and Monetary Union (WAEMU) countries

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Abstract

This paper examines income inequality in the West African Economic and Monetary Union (WAEMU) region, using recent harmonized household survey data across eight member countries.

The study explores the levels and drivers of inequality by assessing the differences between income- and consumption-based measures and measuring the contributions of various income sources.

Findings indicate that income inequality is substantial in WAEMU, with the top 10% capturing 43.2% of total income on average, significantly higher than the top 10% consumption share. Income from non-agricultural self-employment and wage employment are key drivers of inequality, while agricultural income and transfers exhibit equalizing effects.

The study also investigates the role of education, revealing that high returns to education in countries with low tertiary attainment—such as Niger and Burkina Faso—further exacerbate income disparities.

Despite their cultural and geographical proximity and similar institutional frameworks, the eight WAEMU countries display diverse inequality patterns, pointing to the influence of country-specific factors.

Measurement challenges, including the predominance of informal employment, underscore the need for supplementary data sources to enhance accuracy.

This analysis emphasizes the importance of policies focused on equitable education access, economic diversification, and improved data collection to address inequality effectively across the region.

Keywords

Inequality, education, West Africa

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JEL Classification

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Résumé
Cet article examine l'inégalité des revenus dans la région de l'Union Économique et Monétaire Ouest-Africaine (UEMOA) en utilisant des données récentes d'enquêtes harmonisées auprès des ménages dans huit pays membres.

L'étude explore les niveaux et les déterminants de l'inégalité en comparant les mesures fondées sur les revenus et sur la consommation et en mesurant la contribution de diverses sources de revenus.

Les résultats montrent que l'inégalité des revenus est substantielle dans la région de l'UEMOA, les 10 % les plus riches captant en moyenne 43,2 % du revenu total, soit une part significativement plus élevée que celle de la consommation des 10 % les plus riches.

Les revenus provenant de l'auto-emploi non agricole et de l'emploi salarié constituent des moteurs essentiels de l'inégalité, tandis que les revenus agricoles et les transferts exercent des effets égalisateurs.

L'étude examine également le rôle de l'éducation et révèle que les rendements élevés de l'éducation dans des pays où le taux de scolarisation tertiaire est faible – comme le Niger et le Burkina Faso – exacerbent davantage les disparités de revenus.

Malgré leur proximité culturelle et géographique et des cadres institutionnels similaires, les huit pays de l'UEMOA présentent des schémas d'inégalité variés, ce qui souligne l'influence de facteurs spécifiques à chaque pays. Les défis de mesure, y compris la prédominance de l'emploi informel, soulignent le besoin de sources de données complémentaires pour améliorer la précision des analyses.

Cette étude met en avant l'importance de politiques axées sur un accès équitable à l'éducation, la diversification économique et l'amélioration de la collecte de données pour aborder efficacement l'inégalité dans la région.

Mots-clés
Inégalités, éducation, Afrique de l'Ouest

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Introduction

Poverty has long been the main focus of research in development economics on Africa (Acemoglu and Robinson, 2010). However, human development and poverty indicators have not improved as expected and reports by the World Bank on the attainment of Millennium Development Goal (MDGs) targets have shown that poverty decrease on the African continent has been modest at best. This stands in contrast with statistics showing that African countries have enjoyed a significant resurgence in growth since the mid-1990s (Fosu, 2015). Solving this apparent puzzle has sparked interest in studying inequality as one of the potential factors behind the low growth elasticity of poverty reduction in Africa (Cornia, 2019; Fosu, 2009; Thorbecke, 2013).

This paper addresses three key research questions regarding income inequality in WAEMU countries.

First, how high is inequality in these countries from the perspective of income and consumption?

Second, which factors explain the variation in income inequality across WAEMU member states, despite their shared institutional framework, comparable inter-tropical climate and monetary union? We examine several potential drivers including institutions, structural transformation patterns, spatial disparities, and the composition of household income sources.

Third, given the region's recent educational expansion, how does human capital accumulation contribute to income inequality?

By leveraging harmonized household survey data from the EHCVM, we can examine these questions systematically across eight countries, offering insights into both the measurement and determinants of inequality in West Africa. This analysis is particularly relevant given the puzzle of persistent poverty despite economic growth in the region, and the potential role of inequality in mediating this relationship.

Our analysis yields several important findings about inequality patterns in WAEMU countries.

First, we document substantial disparities between consumption and income-based inequality measures, with the top 10% income share averaging 43.2% compared to 29.8% for consumption - a gap of 13.4 percentage points that varies significantly across countries.

Second, we find striking variation in inequality levels across member states despite their shared institutional framework: the top 10% income share ranges from 38.9% in Guinea-Bissau to 48.5% in Burkina Faso. This variation appears unrelated to GDP per capita levels, suggesting other factors are at play.

Our examination of income sources reveals that non-agricultural self-employment and wage income tend to increase inequality, while agricultural income and transfers generally have an equalizing effect.

Spatial decomposition shows that within-urban inequality, rather than rural-urban divides, drives overall inequality in most countries.

Finally, our analysis of education's role highlights how limited access to secondary and tertiary education, combined with high returns to schooling - particularly in poorer countries - creates a powerful mechanism for inequality persistence.

These findings challenge simple narratives about inequality in West Africa and suggest the need for country-specific policy approaches.

The remainder of this paper is organized as follows.

Section 2 reviews the literature on inequality drivers in Africa, highlighting key factors including historical legacies, structural transformation, and educational disparities.

Section 3 presents our data and methodology, discussing the unique features of the EHCVM surveys and our approach to measuring inequality.

Section 4 documents the patterns of income and consumption inequality across WAEMU countries, including comparisons with national accounts data.

Section 5 examines potential drivers of inequality, analyzing the roles of institutions, geography, economic development, income sources, and spatial factors.

Section 6 focuses specifically on education's contribution to inequality, examining both the distribution of educational attainment and returns to schooling.

Section 7 concludes with policy implications and directions for future research.

1. Inequality drivers: a review of some usual suspects

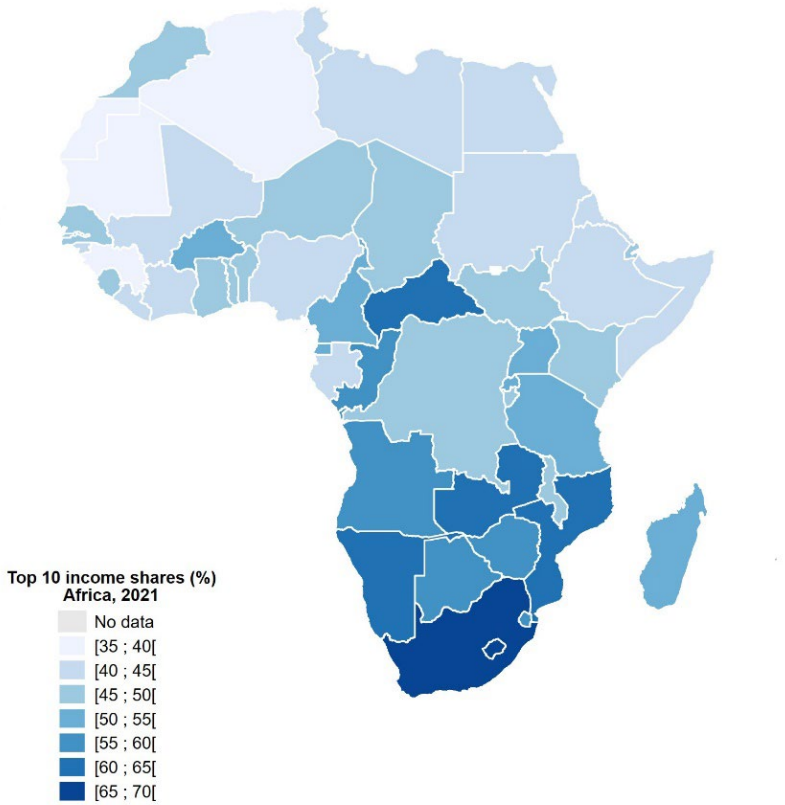
Research on income inequality in African countries faces significant challenges, particularly due to the scarcity of high-quality data on the distribution of living standards and other socio-economic indicators (Cornia and Martorano, 2016). However, different databases on inequality have been put together over the years and have fueled research on the drivers of inequality. This literature has explored and identified several potential "suspects", in particular historical, structural, and policy-related factors.

The relationship between institutions, historical legacies, and inequality has been widely studied. Acemoglu, Johnson, and Robinson (2001) were among the first to highlight how colonial policies and institutions created lasting inequalities, especially in land ownership and access to public goods like education and infrastructure. Chancel *et al.* (2023) show that Africa's colonial past continues to shape income inequality today. As shown in Figure 1, high levels of inequality are found in countries of Southern Africa that experienced white settlers' colonization. This type of colonization produced high **land concentration** – through discriminatory laws of access to land – as well as low rural wages – through mobility restrictions. As a result, wealth was concentrated in the hands of a small group of settlers who positioned themselves at the top of the income distribution, a structure that persisted post-independence in the form of an "oligarchic bourgeoisie" (Alvaredo *et al.*, 2021). In the area colonized by France, land policy also had significant effects, by classifying as "public domain" all plots not endowed with private ownership, conflicting with many communal practices and usage rights.

Another major theme in this research focuses on the **structural transformation** of African economies and its implications for inequality. Indeed, **dualism** between agriculture and other sectors has been found to explain much of the cross-country variation in inequality across former French and British colonies (Cogneau and Mesplé-Somps, 2008). Institutional legacies of colonialism, including spatial inequalities resulting from uneven colonial investments, have long-lasting impacts on inequality today (Roessler *et al.*, 2022). In theory, the expansion of labor-intensive sectors such as manufacturing and services should foster wage employment and reduce income inequality (Cornia, 2019). However, unlike Europe during the Industrial Revolution or East Asia more recently, African economies have experienced a shift not from agriculture to manufacturing, but towards mining and services. This divergence from the typical structural transformation has been significant. Instead of the expected employment growth in manufacturing, the reduction in agricultural employment has largely been absorbed by urban services or urban unemployment. The

formal mining sector, being capital-intensive, has not provided sufficient jobs. The informal sector has expanded, offering low-income employment with poor working conditions, resulting in what has been termed the "urbanization of poverty" (Ravallion *et al.*, 2007). This urbanization has not substantially narrowed the urban-rural gap due to persistent public spending biases favoring urban areas. Moreover, liberalization disproportionately benefited urban elites, further entrenching inequality. As a result, inequality increased within both urban and rural areas, even though the gap between the two remained unchanged (Cornia, 2019). Relatedly, empirical analyses have examined the relationship between sectoral value-added growth and inequality using Gini coefficients. Countries where labor-intensive sectors, like modern agriculture and manufacturing, grew or at least stagnated (e.g., Ethiopia, Cameroon, Madagascar) saw falling inequality. Conversely, countries where these sectors stagnated, but capital-intensive and informal sectors grew, experienced rising inequality (Cornia, 2019).

Figure 1. Top 10% income shares across Africa



Source: Robilliard, 2022.

A critical body of literature highlights the role of **agriculture** in reducing inequality. Some scholars argue that improving agricultural productivity can raise rural incomes and encourage the development of non-agricultural sectors, which could promote broader industrialization (Gollin, 2010). This is particularly relevant for Africa, where the agricultural transition is incomplete. Additionally, equitable land distribution is essential for agriculture to be a driver of both poverty and inequality reduction (Griffin et al, 2002; Christiaensen *et al.*, 2011). While economies of scale are limited in farming, they are substantial in the transportation of agricultural goods, where rent positions risks exacerbating inequalities.

The role of **extractive** industries in driving inequality has also received attention. Extractive industries, characterized by high capital intensity and limited employment opportunities, particularly for unskilled labor, tend to fuel inequality. Moreover, resource booms can lead to Dutch disease, where resource windfalls appreciate local currencies and harm labor-intensive, export-reliant sectors (Papyrakis *et al.*, 2004). Extractive sectors also tend to create "consumption cities" rather than fostering broader industrialization (Gollin *et al.*, 2016).

Public policies aimed at **redistribution** have shown limited effectiveness. Though fiscal space has increased—partly due to improvements in tax collection and debt relief—the efficiency of tax-and-transfer systems remains low in most African countries (Odusola, 2017). The difference between gross and net Gini coefficients has been narrowing, indicating a decline in the effectiveness of redistribution. Tax revenues remain highly dependent on extractive industries in many countries, which makes it difficult to ensure long-term sustainability of redistributive policies (Chancel *et al.*, 2023).

In recent years, there has been a significant rise in **social protection** spending, though this varies by region and is often not aligned with economic growth (Bhorat *et al.*, 2017). The positive effects of transfer programs on poverty and inequality reduction are well documented, particularly in Southern Africa. However, the overall impact of social protection on inequality remains unclear. Countries with higher social protection spending tend to have better democratic governance and lower dependence on resources (Bhorat *et al.*, 2017). Still, the coverage and quality of social protection programs remain key concerns across the continent.

Lastly, **educational inequalities** persist despite notable progress in primary school enrollment. Secondary education enrollment remains uneven, particularly across income groups, perpetuating high wage premiums for skilled workers and contributing to income inequality. The quality of education continues to be a significant challenge, particularly in less developed regions, undermining efforts to reduce inequality through human capital

development (Bold *et al.*, 2018). The unequal access to education is documented by Spaull and Taylor (2015), who show how disparities in educational quality and opportunities, especially between urban and rural areas, reinforce broader inequality.

In summary, the literature on income inequality in Africa identifies a number of factors shaping inequality: structural transformation, agricultural productivity, extractive industries, tax policy, social protection policies. Institutional factors (quality of governance, corruption, nepotism, discrimination) are also likely to play at least an indirect role as they shape the design and implementation of public policies. Demographic factors (growth, migration, family structure and social mobility) are likely to play a dynamic role. However, data limitations and the complex interplay of these factors make it difficult to draw definitive conclusions, underscoring the need for further research.

2. How high is income inequality in WAEMU countries?

Research on poverty and inequality in developing countries has typically relied on consumption data. This is primarily because poverty is fundamentally linked to deprivation, making consumption a more direct measure and because poverty reduction has been a priority since the creation of Official Development Assistance, whereas Inequality reduction has been recently added when setting the 17 SDG. Additionally, assessing income in these regions poses many challenges due to widespread informality.

As Deaton (1992) points out "The code that generates the income figures is many hundreds of line long, and embodies many difficult decisions, both about conceptual matter, and about likely measurement errors." However, to effectively address the underlying causes of poverty and inequality, it is essential to understand how income is generated at the household level. Therefore, there is a need for data that also captures income information.

2.1 Data, concepts and methods

Many household surveys have been collected in Low Income countries over the past decades for measuring living conditions and poverty. In the case of WAEMU countries, an average of 8 surveys per country have been collected since 1985. Despite this important collection effort, the possibility of comparing poverty and inequality across countries is hindered by the fact that survey design varies both within and across countries. This variation usually entails different ways of collecting information on income and consumption. In 2018, the Enquête Harmonisée sur les Conditions de Vie des Ménages (EHCVM) was collected in 8 West African countries: Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, and Togo. Unlike other living standards surveys available in the region, the EHCVM uses identical questionnaires to measure living conditions through income and consumption. Survey samples are representative at the country level (varying from 5,300 households to almost 13,000 households depending on the country) (see Table 1).

The questionnaire design is based on standard practice to measure living conditions through consumption and income. Different consumption modules are used to collect information on current expenditures, for food and non-food items, as well as on durable goods. The consumption concept used here includes: the value of expenditures on food and non-food items, the value of self-consumption of own production of food, the value of the use of durable goods, and the value of imputed rents.

Table 1. EHCVM Sample sizes

	BEN	BFA	CIV	GNB	MLI	NER	SEN	TGO
Households	8 012	7 010	12 992	5 351	6 602	6 024	7 156	6 171
Individuals	42 272	45 612	60 384	42 839	46 014	35 406	66 120	27 398
Household size	5.2	6.5	4.6	8.0	7.0	5.9	9.2	4.4
	(3.0)	(4.1)	(3.0)	(4.8)	(3.8)	(3.1)	(6.0)	(2.7)

Source: EHCVM 2018, authors' calculations. Standard errors in parenthesis.

Consumption data is collected at the household level using different reference periods depending on the type of good, and the values are then annualized. While expenditure values are reported directly, the valuation of self-consumption requires several assumptions about prices. First, prices are not collected directly but are inferred from households' reports on the value of the quantities they sold. Second, quantities are reported using different units, which need to be standardized. Third, since prices vary across regions, a decision must be made about the appropriate level at which to calculate average prices. Lastly, due to significant seasonal variations in food prices, the EHCVM was conducted in two waves. The prices used to value self-consumption are calculated as averages across both waves. Similarly, the estimation of the value of the use of durable goods requires assumptions concerning the price and lifespan of the goods owned by the households.

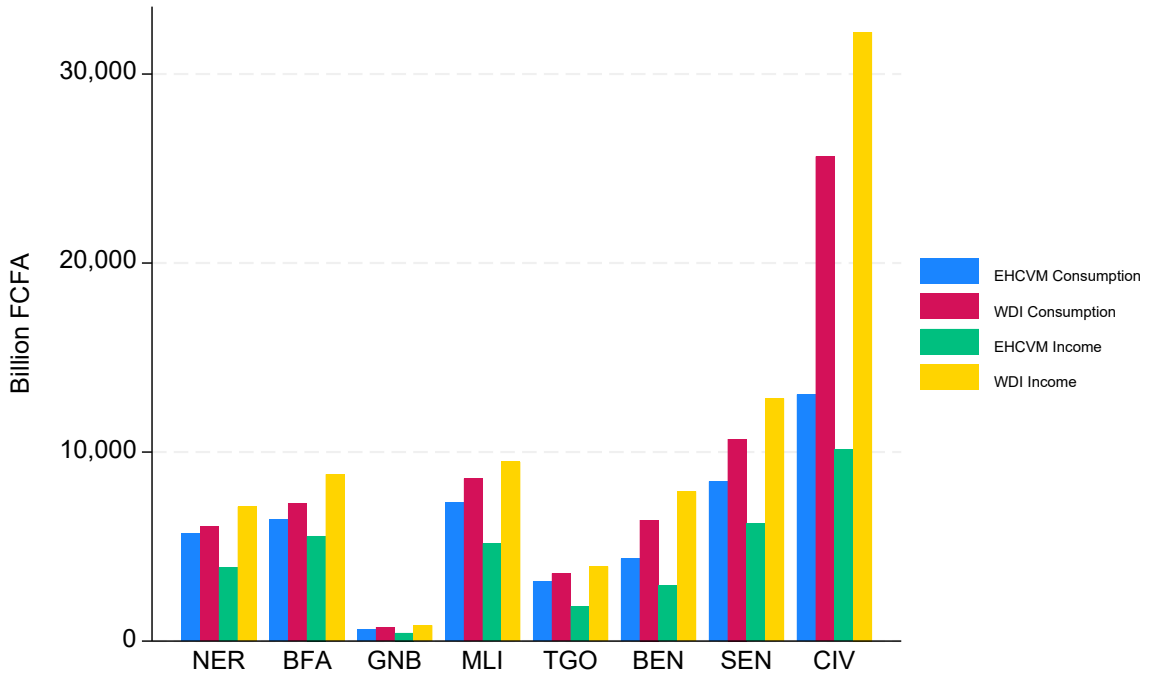
Lastly, rents must be imputed for homeowners. The imputation relies on a standard two steps procedure: first, a multivariate linear regression model is estimated on the sample of tenants using information on dwelling characteristics and rent. Second, this model is used to impute the value of rent for homeowners using the characteristics of their dwelling.

The survey also collects comprehensive data on incomes, both at the household and individual levels. As a result, total income at the household level includes: the earnings from wage employment, collected at the individual level (Section 4 of the survey questionnaire); non-labor income that includes pensions, collected at the individual level (Section 5); imputed rents, collected at the household level (Section 11); the net profit from non-agricultural enterprises, collected at the enterprise level (Section 10); the value of private transfers (including domestic transfers and remittances), collected at the individual level (Section 13); the value of public transfers collected at the individual level (Section 15); the net

profit from agriculture, collected at the household level (Section 16); the net profit from livestock breeding, collected at the household level (Section 17); and the net profit from fishing, collected at the household level (Section 18).

Before measuring income inequality, we compare aggregate consumption and income metrics obtained from EHCVM survey data with National Accounts statistics. This comparison is presented in Figure 2 and reveals two significant methodological challenges.

Figure 2. A comparison of survey-based and National Accounts aggregates



Source: EHCVM 2028 for survey-based aggregates and WDI for NA aggregates.

First, there exists a substantial discrepancy between survey-based aggregates and National Accounts data. While such divergences are not uncommon in empirical research, the magnitude of the income differential—ranging from 37.0% in Burkina Faso to 69% in Côte d'Ivoire—raises considerable methodological concerns.

Second, the data consistently shows that survey-based income aggregates fall below their consumption counterparts. Specifically, the income aggregates constitute less than 75% of consumption aggregates on average, despite the ECHVM's comprehensive approach to income data collection across multiple sources.

This significant income-consumption disparity suggests that income is underestimated, either because of sampling or measurement errors, and calls for incorporating complementary data sources, particularly fiscal records, to improve survey-derived estimates. This is the approach developed by the WIL but applications for African countries are scarce given the difficulty of obtaining access to fiscal data[1].

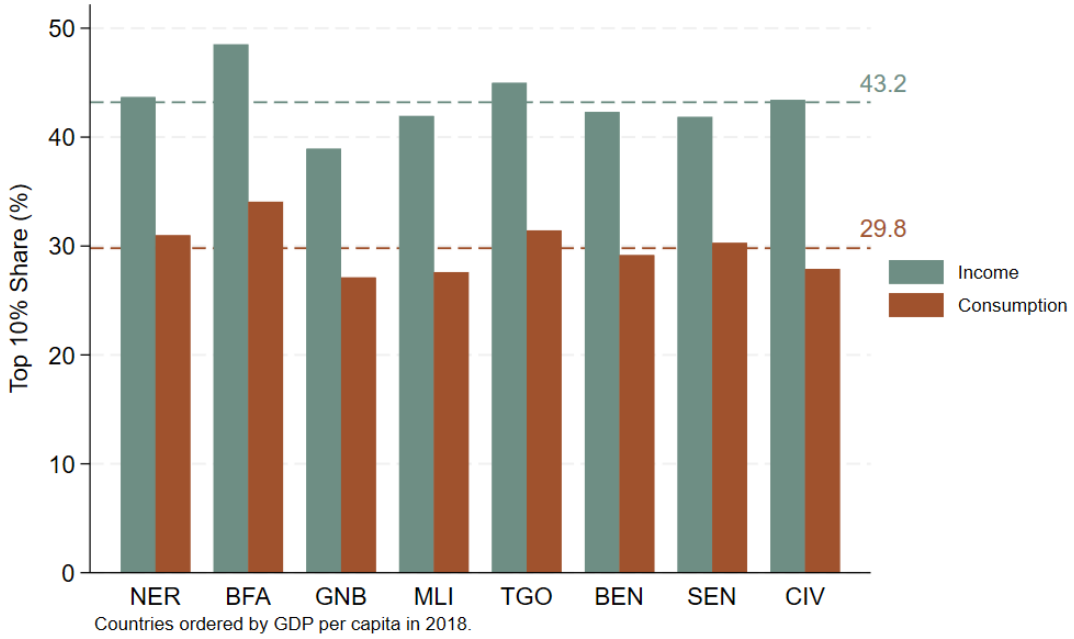
2.2 Income and consumption inequality

There are different indicators used to measure income and consumption inequality using household data. In this paper, we focus mainly on the top 10% share and turn to the Gini index and the Theil index for decomposition purposes. The top 10% shares is estimated using survey-based information on income and consumption from the EHCVM surveys presented above. By combining household income and consumption data with information on household size, it is possible to calculate income (or consumption) per capita and rank households accordingly. The total population can then be divided into ten equal-sized groups (deciles). The share of income (or consumption) for each population decile is calculated by summing the income (or consumption) of all households and individuals within that decile and dividing it by the total income (or consumption).

The results of this computation are presented in Figure 3. It shows that both consumption and income inequality are high in WAEMU member states with the average top 10% consumption share equal to 29.8% and the average top 10% income share equal to 43.2%. Not surprisingly, the analysis also confirms that incomes are much more unequally distributed than consumption: on average, the top 10% share stands at 13.4 percentage points higher for income than consumption. However, this gap is not uniform across countries: it is smaller for Senegal and higher for Côte d'Ivoire. This could suggest that savings are more unequally distributed in Côte d'Ivoire than in Senegal. More in-depth analyses and better data would be necessary to confirm this interpretation.

[1] A project in Senegal using fiscal data on income taxes is underway.

Figure 3. Top 10% shares across WAEMU countries



Source: Authors calculations based on EHCVM data (https://phmecv.uemoa.int).

Another result is worth highlighting. No clear pattern emerges concerning inequality and GDP per capita: while Côte d'Ivoire is much richer than Niger, the income inequality of the two countries is close. Conversely, while Burkina Faso and Guinea-Bissau are close in terms of GDP per capita, they stand far apart in terms of income inequality: 48.5% for Burkina Faso vs. 38.9% for Guinea-Bissau, a gap of 10 percentage points.

3. Why is income inequality high in WAEMU countries? Examining some possible suspects

In this section, we explore some potential underlying factors of the levels of inequality across WAEMU member states.

3.1 Institutions and geography

Institutions and geography are among the potential factors explaining inequality. In the case of the WAEMU countries, they share institutions shaped by French colonial rule, except for Guinea-Bissau, which was a Portuguese colony. This shared history is most visible in their monetary system, specifically in their common currency, the CFA franc. Created in 1945, this currency remains linked to the euro through an agreement with the French Treasury. During colonial times, France established similar systems across these countries—including government structures, legal systems based on French law, and educational systems. These inherited institutions have lasted long after independence and continue to influence the way these countries are governed and regulated today.

The countries in the West African Economic and Monetary Union are quite different in their geography, especially in terms of access to the sea, which affects how their economies can develop. Five countries - Benin, Côte d'Ivoire, Guinea-Bissau, Senegal, and Togo - have coastlines along the Atlantic Ocean. The other three - Burkina Faso, Mali, and Niger - are landlocked. These differences in geography strongly affect how these countries can trade and develop. The coastal countries have been able to build important ports, like those in Abidjan, Dakar, and Cotonou, which have become important centers for trade in the region. However, the landlocked countries face bigger challenges as they have higher transportation costs and must move most of their export goods through other countries to reach the sea, which makes them more vulnerable to problems outside their control. These geographic differences shape the way each country builds its economy, plans for development, and works with its neighbors.

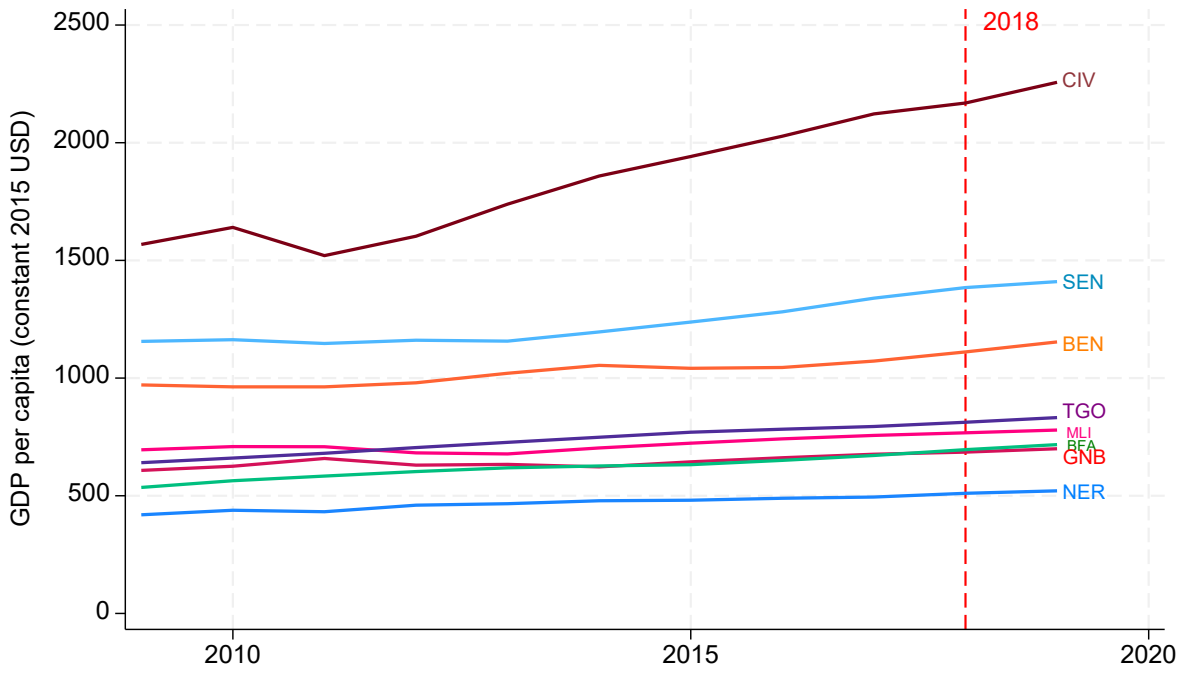
The relationship between these factors and inequality in WAEMU countries somewhat challenges conventional expectations. While inequality is found to vary, institutions likely play a minimal role in explaining this variation across countries given their similar institutional frameworks. Concerning geography, while one might expect coastal countries to exhibit higher levels of economic development and inequality due to concentrated economic activity around ports, the evidence suggests otherwise. Surprisingly, landlocked

countries like Burkina Faso and Niger demonstrate higher income inequality than coastal Guinea-Bissau, indicating that other factors may be more significant in determining inequality patterns in the region.

3.2 Economic development and structural transformation

Despite the institutional uniformity of WAEMU member states, economic outcomes across member states are very different. As shown in Figure 4, the income per person varies greatly across these countries. For example, in Niger, the GDP per person in 2018 is less than 500 USD, while in Côte-d'Ivoire, it is more than 2,000 USD. This means that the richest country in the union has four times more income per person than the poorest one.

Figure 4. GDP per capita

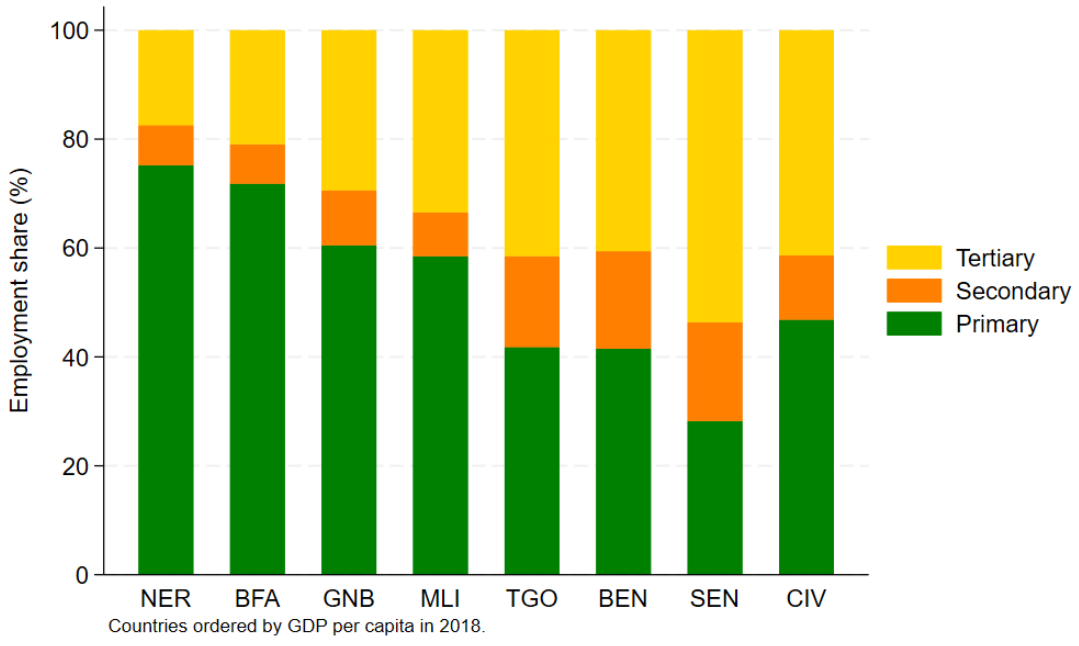


Source: WID data (https://wid.world/).

As mentioned above, however, no clear pattern emerges concerning inequality and GDP per capita as inequality is found to as high in Niger and Côte d'Ivoire. This comes as a surprise from the perspective of economic theory that suggests that inequality follows an inverted U-shape relationship with respect to income per capita. Despite the relatively wide range of wealth across the 8 countries, no such pattern is apparent.

Instead, the pattern of employment across countries in the West African Economic and Monetary Union (WAEMU) appears to correspond to how economies typically develop over time. The data represented in Figure 5 shows that the proportion of people working in farming declines monotonically with increasing GDP per capita from 75% in Niger to less than 30% in Senegal. This pattern of employment across different sectors is consistent with economic theory that suggests that as countries develop, they typically move from farming to industry and services. This shift is expected to affect how income is distributed: at first, inequality tends to increase because workers in modern sectors earn much more than those in traditional farming and then, once half the population has shifted, inequality is expected to decrease.

Figure 5. Employment by sector



Source: Authors' calculations based on EHCVM data (https://phmecv.uemoa.int).

Looking at the WAEMU countries, the structural transformation exhibits two anomalies.

First, the shift from farming to other sectors appears incomplete in that the secondary sector appears to be "by-passed" and jobs seem to shift directly from agriculture to the service sector. Even in richer countries like Côte d'Ivoire and Senegal, relatively few people work in manufacturing jobs compared to other countries at a similar level of economic development. This incomplete change might explain why these countries continue to have high levels of inequality. They seem to be caught in a middle stage where some people earn much more than others, without reaching the point where income differences typically start to decrease.

The second anomaly is Côte d'Ivoire where, despite being the richest country in WAEMU, about 45% of its workers are still in farming activities. This might seem unusual for a richer country, but there is a specific reason - Côte d'Ivoire's large cocoa farming sector. While cocoa farming counts as a farming activity, it creates significant wealth for the country which a prominent cocoa beans producer and a price-maker on this product. This suggests that simply looking at how many people work in farming versus other sectors might not be the best way to understand how some economies develop, especially when they focus on valuable farm products like cocoa.

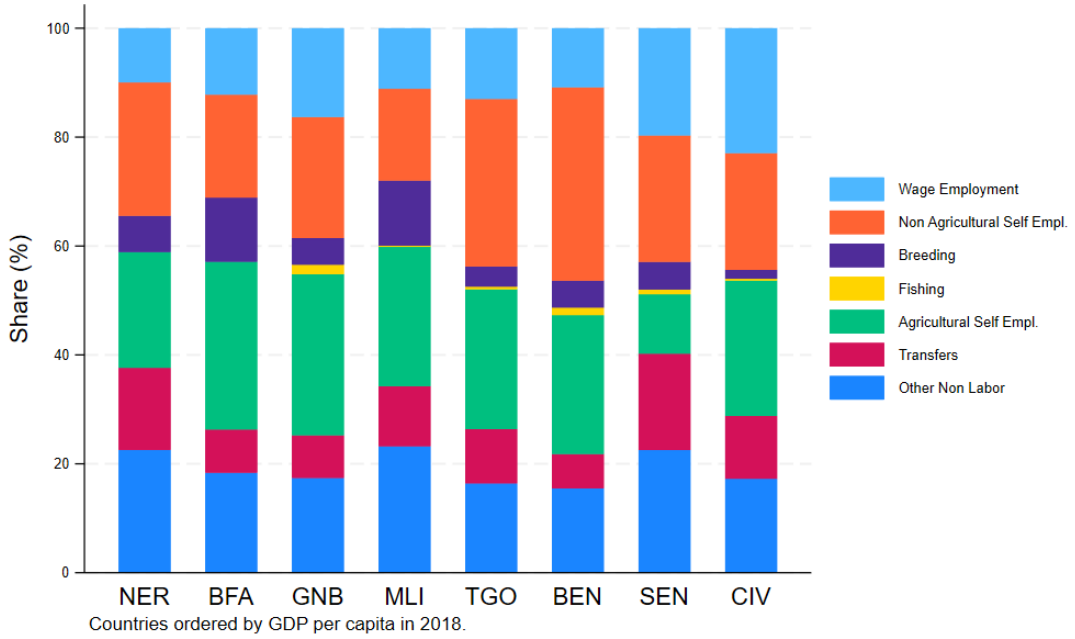
3.3 Income sources

As presented above, income measured at the household level is equal to the sum of income from a variety of sources. Figure 6 shows that non-agricultural self-employment activities account for a very large share of household income in most countries. Then, depending on the country, either agricultural income or wage income represents the second largest share of income.

Some countries show slightly different patterns: Mali stands out for the large share of income from livestock, while transfers represent a large share of household income in Senegal, a feature that has been shown to reduce inequality (Akim and Robilliard, 2019).

Graphs by decile are presented in Appendix A and show some distinctive patterns. In all countries, the income shares of wage employment and non-agricultural self-employment increase with income while the shares of non-labor and agricultural incomes decrease. The gradients appear steeper in some countries, for instance, Burkina Faso and Niger, which is a possible factor for the high inequality level in these countries. Instead, the profiles are somewhat flatter in Benin.

Figure 6. Average income structure by source (% of total income)



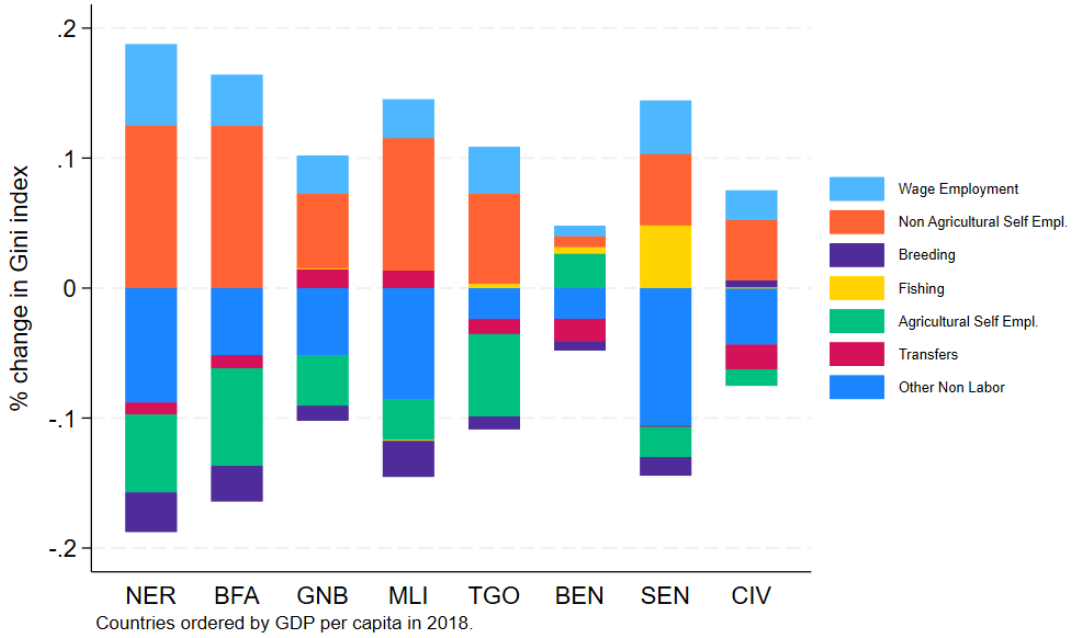
Source: Authors' calculations based on EHCVM data (https://phmecv.uemoa.int).

As these income components have different distributions, they are likely to contribute positively or negatively to total income inequality. Using standard Gini decomposition techniques by income source, we measure the contribution of income sources to income inequality. Gini decomposition techniques are statistical methods used to analyze the sources of income inequality within a population. The Gini coefficient, which measures inequality on a scale from 0 (perfect equality) to 1 (perfect inequality), can be decomposed to understand how different factors contribute to overall inequality. The primary goal of Gini decomposition is to identify how much each factor—such as various income sources or demographic groups—contributes to the overall Gini coefficient. The process begins by calculating the overall Gini coefficient for the entire population, next, Gini coefficients are determined for each income source. Finally, the contribution of each income source to the overall Gini coefficient is assessed, using formulas that account for the size of each group and its internal inequality.

Figure 7 presents the results with each color-coded segment representing the contribution of various income sources to changes in income inequality. More precisely, the graph reports the percent change in the Gini when the income from a given source increases by 1%. Hence income sources above zero contribute positively to income inequality and the magnitude of the contribution is reflected in the height of the rectangles. Wage income (light

blue) reflects changes from wage-related earnings, while non-agricultural self-employment income (orange) shows inequality effects from income generated through self-employment outside agriculture. Agricultural income (green) represents contributions from farming activities, and breeding income (purple) pertains to livestock. Fishing income (yellow), transfers (red, representing social transfers and remittances), and other non-labor income (blue) each indicate their respective influences.

Figure 7. Contribution of income sources to total income inequality (% changes)



Source: Authors calculations based on EHCVM data (https://phmecv.uemoa.int).

In most countries, non-labor income, represented by blue, significantly reduces inequality, particularly in Niger, Mali, and Senegal, suggesting an equalizing effect within these economies. On the other hand, non-agricultural self-employment and wage income generally contribute to rising inequality, with notable impacts in Niger, Burkina Faso, and Mali. Income from non-agricultural self-employment appears to be concentrated among wealthier households, making it a significant driver of inequality in almost all countries.

Each country exhibits distinct income patterns. Senegal stands out for its fishing income, which uniquely contributes to inequality among the eight countries. Interestingly, transfers in Senegal do not appear to increase inequality. This is likely because they include not only

remittances but also domestic and public transfers. In Benin, income sources generally have smaller contributions to inequality, suggesting that income inequality in this country may be less influenced by specific income sources. Agricultural and livestock income have mixed effects; livestock income plays a minor role in most cases but slightly increases inequality in Guinea-Bissau and Mali. Overall, the data indicates that wage income and non-agricultural self-employment are key drivers of inequality in the region, while agricultural and non-labor income tend to reduce it.

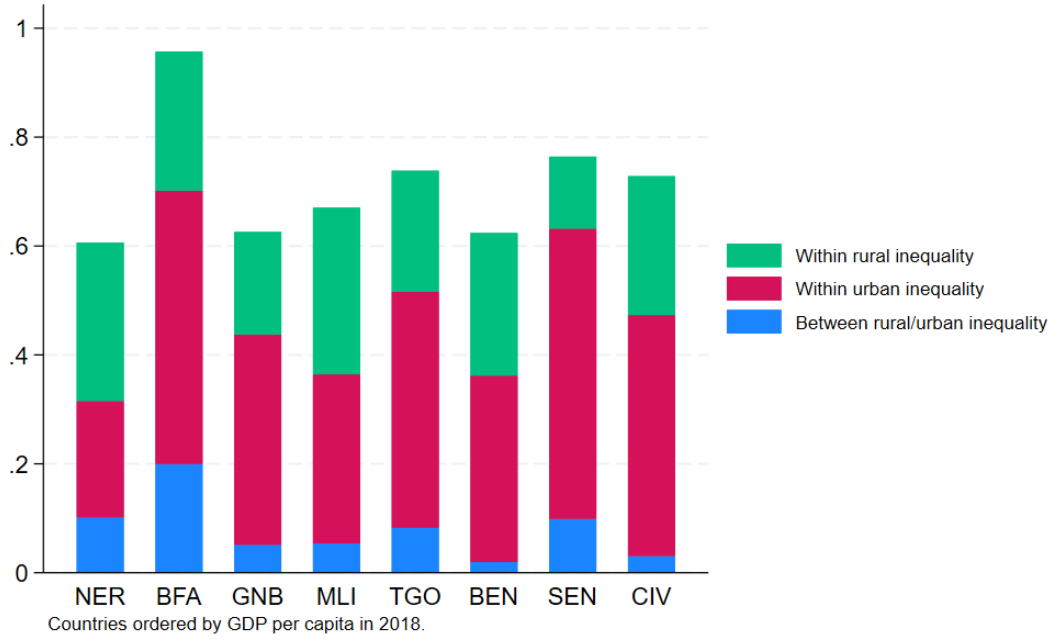
Overall, this visualization highlights the complex income structures across the WAEMU countries and the importance of agricultural income in reducing inequality. Policies aimed at supporting agricultural activities and improving access to farming opportunities could be particularly effective in managing income inequality while addressing disparities in wage and self-employment incomes could further promote economic equity across the region.

3.4 Spatial inequality

The rural-urban divide is frequently cited as a crucial determinant of economic inequality. To systematically evaluate how this spatial divide contributes to cross-country inequality patterns, we employ a decomposition analysis that breaks down total inequality into distinct components. This methodological approach, using area of residence (urban versus rural) as the primary spatial criterion, separates total inequality into two main elements: one capturing the inequality between urban and rural average incomes, and another reflecting the total inequality within each area. The within-area component represents the weighted sum of inequality measures calculated separately for urban and rural populations.

Our analysis, illustrated in Figure 8, reveals several important findings. In most countries, within-urban inequality (red) is the largest contributor to total inequality, indicating that disparities within urban areas are a significant factor driving income inequality. This is especially pronounced in Burkina Faso, Senegal, and Côte d'Ivoire, where urban inequality accounts for more than half of the total inequality. Within-rural inequality (green) is also substantial, especially in Burkina Faso and Togo, where rural areas contribute almost as much as urban areas to overall inequality. This suggests that inequality within rural regions remains an important factor, particularly in countries with important rural populations.

Figure 8. Urban and rural decomposition of the Theil inequality index



Source: Authors' calculations based on EHCVM data (https://phmecv.uemoa.int).

The blue segments, representing between rural/urban inequality, are relatively small across all countries, indicating that the income gap between rural and urban areas is not as significant as the income disparities within each area. This pattern suggests that policies targeting inequality within both urban and rural areas could be more effective than those focusing solely on rural-urban divides.

Overall, the graph highlights the importance of addressing inequality within urban areas to reduce overall income inequality, while also recognizing the substantial role of within-rural inequality in countries like Burkina Faso and Togo. Addressing intra-urban and intra-rural disparities may be key to reducing income inequality in the WAEMU region.

In this section, we have investigated inequality at the household level and examined the contribution of various dimensions: institutions, economic development, income sources, and area of residence. Results show that some of these dimensions contribute to income inequality and point to specific areas where underlying factors should be investigated. We now turn to one of these factors: education.

4. Education and income inequality

A more thorough understanding of inequality patterns and dynamics in Africa is needed. In particular, research on the distribution and returns of human capital is an interesting line of analysis as the continent has been marked by strong progress in education in the last decades. While this progress is encouraging in itself, it is likely to have fueled income inequality in contexts where higher education and formal sector employment are only available to a minority of the labor force. To investigate this question, we first analyze the distribution of education in 8 West African countries. Then we estimate the contribution of education to individual household income inequality.

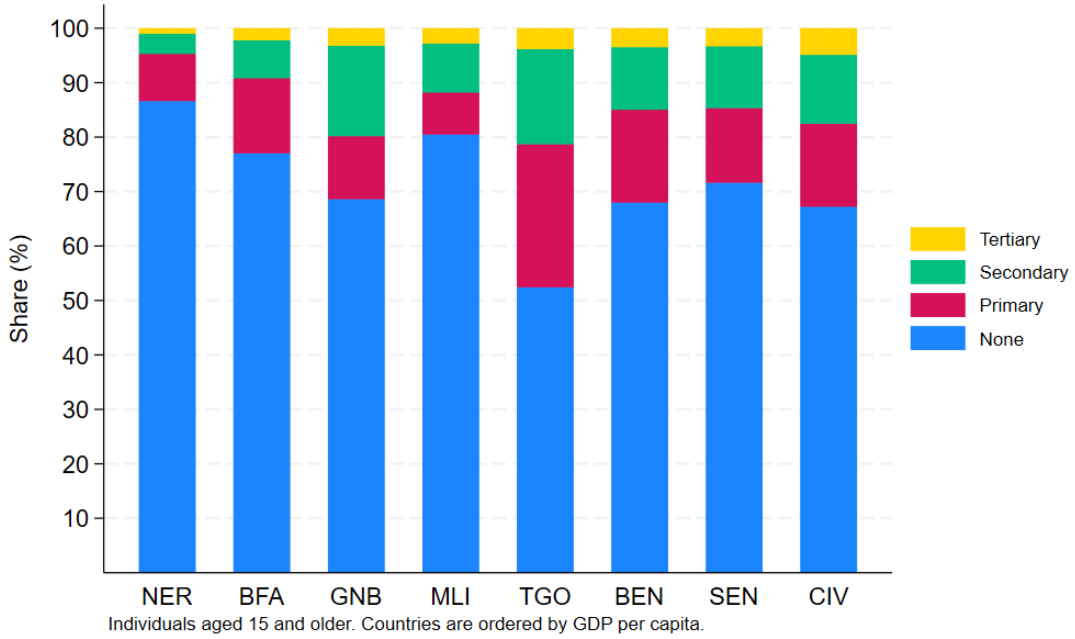
4.1 The distribution of education across WAEMU countries

Figure 9 represents the distribution of education across 8 countries for individuals aged 15 and older. It highlights a stark educational divide across eight WAEMU countries, with the vast majority of individuals aged 15 and older having no formal education. This lack of educational attainment likely contributes significantly to income inequality in the region, as educational attainment is a critical driver of economic opportunity and upward social mobility.

In countries like Niger, Burkina Faso, and Mali, where over 80% of individuals have no formal education, opportunities for well-paying jobs are limited, especially in sectors that require even basic literacy and numeracy skills. This concentration of individuals in low-education, low-income jobs can create a cycle of poverty that reinforces income inequality. Limited access to education, particularly secondary and tertiary education, prevents a large portion of the population from acquiring the skills needed for higher-paying jobs, confining them to informal or subsistence-based employment. Surprisingly given its level of GDP per capita, Togo shows significantly higher shares of individuals with secondary and tertiary education. This higher educational attainment may help explain relatively lower levels of inequality in this country.

In summary, the low levels of educational attainment, especially beyond primary education, likely exacerbate income inequality in WAEMU countries. Investing in universal access to primary education, as well as expanding secondary and tertiary education opportunities, could be crucial steps in reducing income inequality and fostering inclusive economic growth.

Figure 9. Educational attainments by country

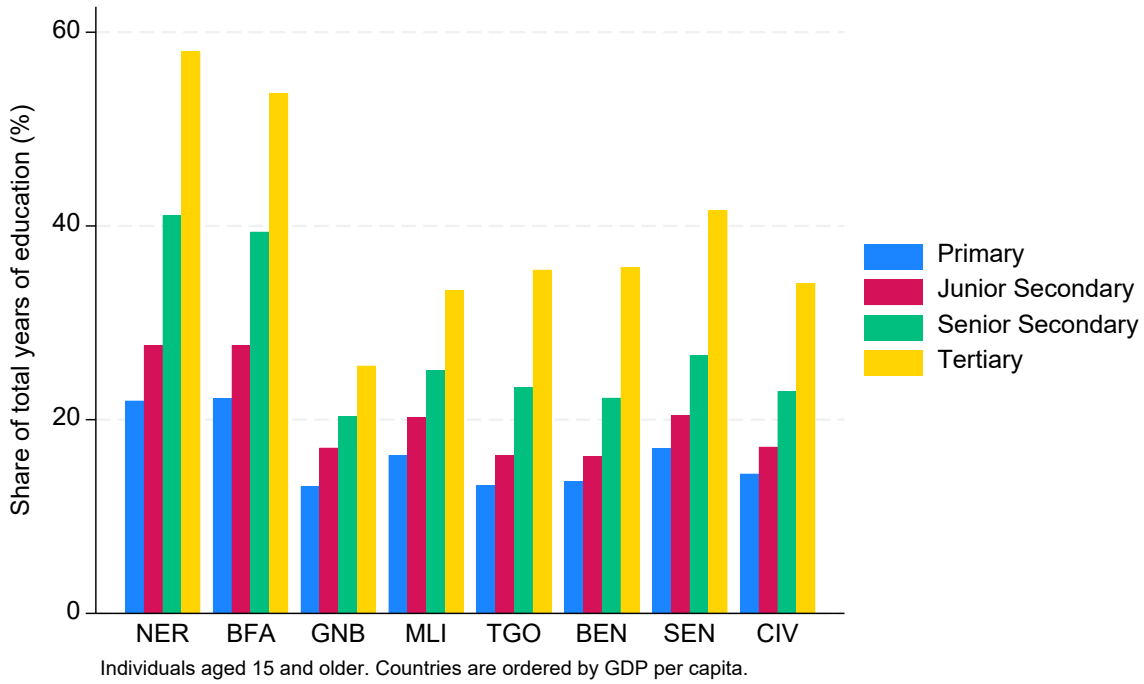


Source: Authors' calculations based on EHCVM data (https://phmecv.uemoa.int).

To complement the analysis, we take a human capital perspective, which considers each year of education as a unit of human capital. It is thus natural to examine how this capital is distributed across households. Figure 10 shows the distribution of years of education among the top 10% richest households across eight WAEMU countries. Each bar represents the share of years at different education levels — primary, junior secondary, senior secondary, and tertiary — of individuals aged 15 and older from the richest decile. For instance, in Niger, households from the richest decile "own" slightly more than 20% of primary education years (blue bar) and close to 60% of tertiary education years (yellow).

A notable feature of this graph is the dominance of tertiary education among the wealthiest households in most of these countries. In Burkina Faso, Niger, and Senegal, the share of tertiary education years is particularly high among the top 10%, indicating that wealthier individuals tend to invest more in higher education. This can lead to a cycle in which higher education levels contribute to higher earnings, allowing the same families to invest further in education and thereby perpetuate inequality. Countries with higher shares of tertiary education among the wealthiest households, like Burkina Faso, Niger, and Senegal, may experience greater educational stratification. Meanwhile, countries such as Guinea-Bissau and Mali show a more balanced distribution across education levels, indicating a relatively smaller disparity even among the wealthiest.

Figure 10. Top 10% share of human capital



Source: Authors' calculations based on EHCVM data (https://phmecv.uemoa.int).

Note: Each bar represents the share of years at different education levels — primary, junior secondary, senior secondary, and tertiary — achieved by individuals aged 15 and older accruing to households from the richest decile.

In conclusion, the graph illustrates that human capital, especially at the tertiary level, is disproportionately accessible to the wealthiest individuals in WAEMU countries. This reinforces the connection between income and educational inequality, as the wealthiest tend to achieve higher education levels, while lower-income households remain limited to primary or junior secondary education. This pattern sustains income inequality, as education is a significant determinant of future income potential.

4.2 Returns to education

Beyond the distribution of education, the human capital approach also has a long tradition examining the returns to education. In the case of Africa, Barouni and Broecke (2014) apply standard Mincer methods to household survey data from several African countries, among which Togo and Mali. Their results show that the returns to education are in general (weakly) increasing with the level of education. Indeed, the first method yields an average rate of return to education (RORE) of 10% for primary education, 28% for upper secondary education, and 30% for tertiary. However, these results vary significantly across countries, as the return

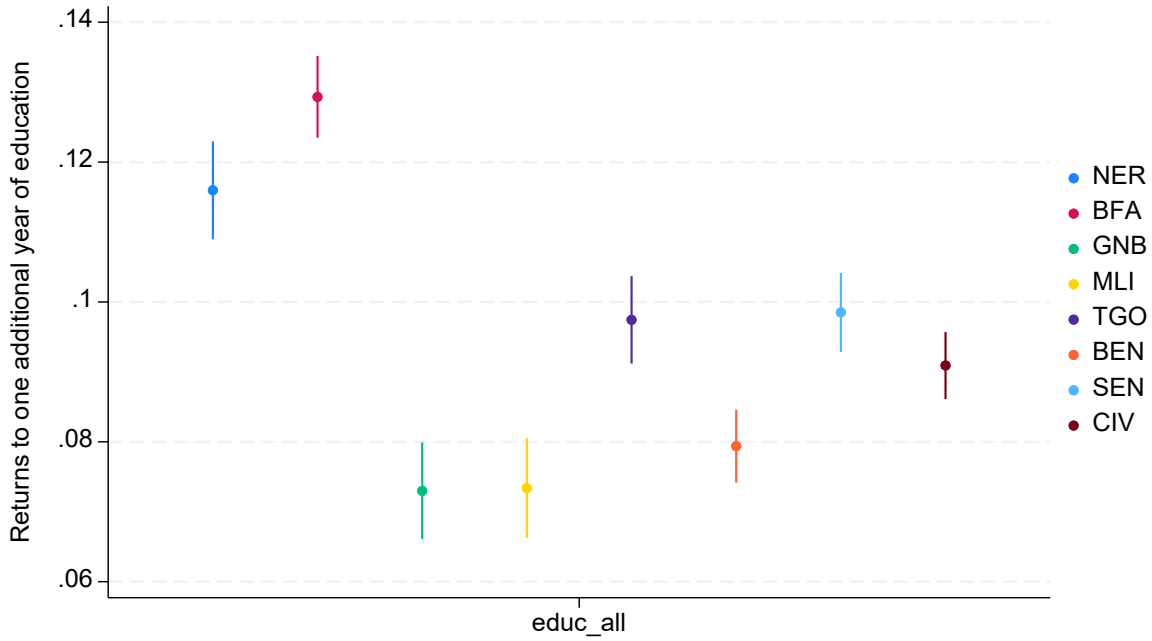
to education ranges from 2% to 20% for primary education, 2% to 88% for upper secondary, and 15% to 61% for tertiary education. Kuepie *et al.* (2009) also estimate returns to education, using comparable labor force survey data from WAEMU countries. Their paper uses slightly more advanced econometric methods to account for sample selectivity and ability bias in the estimation of the earnings equation. The data also allow the authors to compute the RORE by sector (public, formal private, and informal sectors). They find generally increasing returns of education, with absolute values comparable to those reported in Barouni and Broecke (2014). Nevertheless, their data are limited to the capitals of 7 of the 8 WAEMU countries.

Here, we depart from an individual level approach to examine returns at the household level. This approach entails computing the total stock of education of working age individuals at the household level and then regressing household income per capita on the value obtained. Results are presented in Figure 11.

Figure 11 illustrates the returns to an additional year of education in each WAEMU countries, with each point representing the increase in income associated with one more year of schooling. The data reveals a general trend where the returns to education decrease as we move from countries with lower GDP per capita (such as Niger and Burkina Faso) to those with higher GDP per capita (such as Senegal and Côte d'Ivoire). Countries with higher returns to education, like Niger and Burkina Faso, reflect greater income gains for each additional year of schooling. This suggests that in these countries, where education is relatively scarce, an additional year of education yields a significant economic advantage, likely due to a limited supply of highly educated individuals.

In countries with relatively lower returns to education, like Senegal and Côte d'Ivoire, a greater proportion of the population might have access to schooling, reducing the marginal value of each additional year of education. This could suggest a more even distribution of education-related income benefits, which may help reduce income inequality compared to countries with high returns to education. However, even in these countries, income inequality may still persist if access to higher education remains limited to wealthier households. Overall, the graph highlights how varying returns to education contribute to income inequality across the WAEMU region, with higher returns in low-GDP countries likely exacerbating inequality by providing substantial economic advantages to those with more years of schooling.

Figure 11. Returns to education in WAEMU countries



Individuals aged 15 and older. Countries are ordered by GDP per capita.

Source: Authors' calculations based on EHCVM data (https://phmecv.uemoa.int).

Note: Markers indicate point estimates and vertical spikes indicate confidence intervals. The returns are expressed as an increase in wages for each additional year of education. If the returns to one additional year of education are estimated at 0.1, it means that, on average, completing one more year of schooling is associated with a 10% increase in earnings. Confidence intervals are represented by vertical bars

Conclusion

This study offers a comprehensive analysis of income inequality in the WAEMU region, leveraging recent household survey data across eight countries. Our findings underscore significant disparities between income and consumption-based inequality measures, with the income share of the top 10% averaging 43%, nearly 15 percentage points higher than that of consumption. This income inequality is driven by non-agricultural wages and self-employment incomes, which tend to increase disparities, contrasting with the generally equalizing effects of agricultural income and transfers.

Education also plays a complex role, with high returns to education in WAEMU countries further amplifying income inequality. Secondary and tertiary education, particularly in countries like Niger and Burkina Faso with lower tertiary attainment, significantly contribute to labor income inequality. This highlights the critical need for policy strategies that improve equitable access to quality education, which could reduce income gaps by creating more opportunities for income mobility.

The analysis also reveals marked variation in inequality outcomes among WAEMU countries, despite their shared institutional and economic frameworks. For example, the top 10% income share varies by 10 percentage points between Burkina Faso and Guinea-Bissau, while average years of schooling range from 2.0 in Niger to 5.9 in Togo, and the returns to education vary from 7% in Guinea-Bissau to 13% in Burkina Faso. These disparities call for further investigation into the institutional, historical, and structural factors that may be driving these differences across the region.

However, while the EHCVM data provide valuable insights and enable robust cross-country comparisons, limitations persist due to challenges in accurately capturing individual and household incomes. The predominance of informal employment and self-employment in African economies leads to significant measurement difficulties, with income aggregates in WAEMU countries consistently falling below consumption aggregates, averaging less than 75% of consumption measures. This gap underscores the need to integrate alternative data sources, such as fiscal records, to complement survey data and enhance the reliability of income inequality assessments.

In conclusion, while this study highlights critical drivers and patterns of inequality within the WAEMU region, addressing these findings will require targeted, country-specific policy measures aimed at enhancing education access, supporting inclusive economic growth, and improving income measurement accuracy. Such measures are essential for reducing inequality, fostering economic stability, and creating more equitable opportunities across the region.

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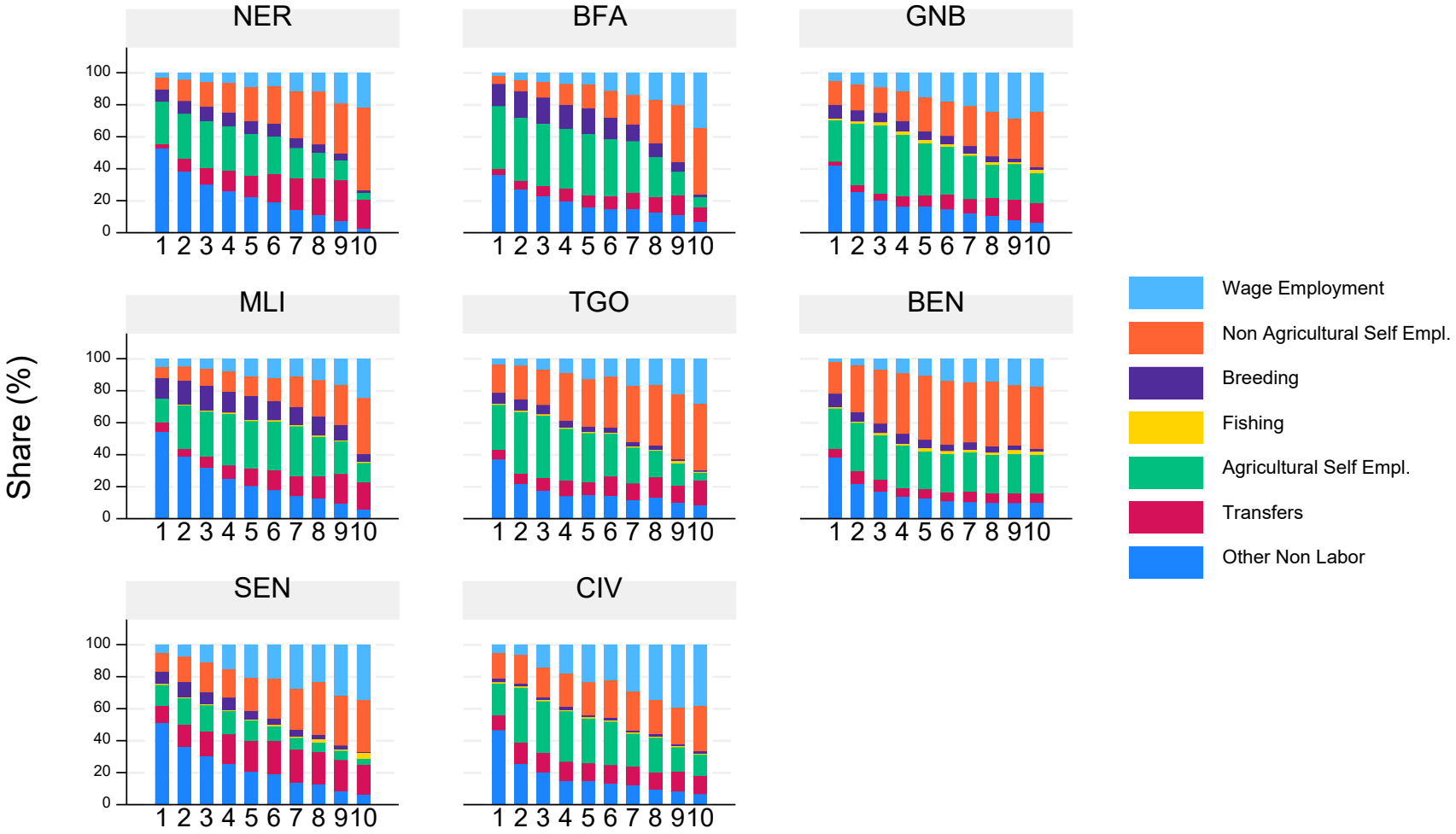
List of acronyms and abbreviations

AFD	Agence Française de Développement
AfDB	African Development Bank
BEN	Benin
BFA	Burkina Faso
CIV	Côte d'Ivoire
EHCVM	Enquête Harmonisée sur les Conditions de Vie des Ménages (*WAEMU harmonized hourseholds survey*)
FCFA	Franc de la Communauté financière en Afrique (*WAEMU common money*)
GDP	Gross Domestic Product
GNB	Guinea-Bissau
MDG	Millennium Development Goal
MLI	Mali
NER	Niger
ODA	Official Development Assistance
RORE	Rate of Return to Education
SDG	Sustainable Development Goal
SEN	Senegal
TGO	Togo
USD	United-States dollar
WAEMU	West African Economic and Monetary Union
WIL	World Inequality Lab

Appendix A. The structure of income by decile



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