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The paradox of productivity: Reallocating labor and capital for economic diversification in Algeria

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Abstract---Algeria, a nation heavily reliant on hydrocarbon revenues, faces a critical juncture in its economic development. Despite periods of robust growth fueled by public spending, the country's long-term prosperity is constrained by structural imbalances, notably a "productivity paradox" where high-growth sectors fail to absorb labor efficiently, while employment concentrates in low-value-added activities. This paper, grounded in the principles of economic geography, analyzes the recent macroeconomic trends (2022–2023) and the heterogeneous nature of sectoral productivity gains in Algeria. I find that while the agricultural and construction sectors have exhibited strong productivity growth, the manufacturing and high-value-added services sectors lag behind international peers. Furthermore, the persistent reliance on public expenditure has channeled employment towards non-commercial services and construction, sectors with limited long-term productivity potential. I argue that achieving sustainable, diversified, and resilient growth requires a fundamental shift in economic policy, focusing on strategic labor and capital reallocation towards high-productivity, non-hydrocarbon sectors, coupled with a disciplined fiscal consolidation strategy to mitigate the vulnerability posed by twin deficits.

Keywords---economic diversification, productivity paradox, resource curse, economic geography, labor reallocation, fiscal policy.

1. Introduction: The Imperative of Diversification

The economic trajectory of resource-rich nations is often characterized by a delicate balance between leveraging natural resource wealth and fostering a diversified, resilient non-resource economy (Rodrik, 2013; Banerjee & Duflo, 2005). For Algeria, this challenge is particularly acute (National Agency for Territorial Planning and Attractiveness (Algeria), 2022). Hydrocarbon exports have historically provided the fiscal and external buffers necessary for state-led development, enabling significant public investment and social programs (Benbouziane & Benbouziane, 2017). However, the volatility of global oil and gas prices exposes the economy to recurrent shocks, manifesting as widening fiscal and current account deficits when prices decline.

The core issue lies in the nation's productivity landscape and the misallocation of labor and capital, a phenomenon central to the study of economic geography and development economics (Kharchi & Miossec, 2024; McMillan & Rodrik, 2011). This paper aims to dissect this "productivity paradox" and propose policy avenues for structural transformation, moving beyond the reliance on public spending as the primary engine of growth. I analyze the period 2022–2023, a time marked by global economic recovery and high energy prices, to assess Algeria's progress toward sustainable diversification.

2. Literature Review: The Resource Curse, Structural Change, and Productivity

The theoretical framework for this study rests on three interconnected pillars: the resource curse hypothesis, the dynamics of structural change, and the productivity paradox.

2.1. The Resource Curse and the Dutch Disease in Algeria

The Resource Curse hypothesis posits that countries abundant in natural resources often experience slower economic growth and greater volatility than resource-poor nations (Rodrik, 2013). For Algeria, this is primarily channeled through the Dutch Disease effect, where massive hydrocarbon revenues lead to an appreciation of the real exchange rate, making non-hydrocarbon exports uncompetitive and non-hydrocarbon imports cheaper (Belaid, 2021; Aboal & Tacsir, 2018). While some scholars argue that the problem lies not in the resource abundance itself but in weak governance and institutional quality (Benbouziane & Benbouziane, 2017), the economic reality in Algeria demonstrates a clear structural dependence. The reliance on oil revenues has historically financed public spending, which, in turn, crowds out private sector investment and distorts the labor market by creating a large, low-productivity public sector (Gelb, 2010). This structural dependence is the root cause of the fiscal and external vulnerabilities observed in the macroeconomic data.

2.2. Structural Change and the Productivity Paradox

Structural change is defined as the reallocation of economic activity across sectors, typically from low-productivity sectors (like traditional agriculture) to high-productivity sectors (like manufacturing and modern services) (McMillan & Rodrik, 2011). This reallocation is the primary driver of aggregate productivity growth in developing economies. However, Algeria exhibits a Productivity Paradox: while the non-hydrocarbon economy has grown, the reallocation of labor has often been dysfunctional. Instead of moving into high-productivity manufacturing, labor has been absorbed by low-productivity sectors such as construction and non-commercial services, often fueled by public spending (World Bank, 2023). This phenomenon, where labor moves to sectors with limited growth potential, acts as a significant drag on the overall economy (McMillan & Rodrik, 2011). Addressing this paradox requires understanding the rigidities that prevent capital and labor from flowing to the most productive uses.

3. Macroeconomic Context and Twin Deficits (2022–2023)

The period 2022–2023 saw significant fluctuations in Algeria's macroeconomic stability, largely dictated by global energy markets and domestic fiscal policy (IMF, 2023).

3.1. Growth Dynamics and External Vulnerability

Following a strong rebound in 2022, real GDP growth moderated in 2023, primarily due to a contraction in the hydrocarbon sector (IMF, 2023). Conversely, non-hydrocarbon GDP demonstrated resilience, supported by strong investment and household consumption. However, this domestic demand-led growth model has exacerbated external vulnerabilities. The surge in investment, particularly in capital goods, stimulated a significant increase in import volumes, leading the current account to post its first deficit in three years (World Bank, 2023). This trend underscores the economy's structural dependence on imports to sustain non-hydrocarbon growth, a classic symptom of the "Dutch Disease" effect (Belaid, 2021).

3.2. Fiscal Imbalances and the Depletion of Buffers

The fiscal situation mirrored the external challenges. The budget deficit widened dramatically in 2023, reaching its highest level since 2015 (IMF, 2023). This widening was a direct consequence of sustained high public expenditure combined with a sharp decline in hydrocarbon revenues. The reliance on oil savings, specifically the Revenue Regulation Fund (FRR), to finance this deficit is nearing its limit. The non-hydrocarbon overall budget balance, a key indicator of structural fiscal health, remained deeply negative, highlighting the persistent gap between public spending commitments and non-hydrocarbon revenue generation, making the economy highly susceptible to future oil price volatility.

Table 1
Key Macroeconomic Indicators (2022–2023)

Indicator	2022	2023 (Est.)
Real GDP Growth (%)	3.6	4.1
Non-Hydrocarbon GDP Growth (%)	4.4	4.2
Hydrocarbon GDP Growth (%)	-0.2	3.6
Current Account Balance (% of GDP)	8.6	2.6
Overall Budget Balance (% of GDP)	-3.0	-5.5
Non-Hydrocarbon Budget Balance (% of GDP)	-20.7	-24.6
Hydrocarbon Exports (% of GDP)	26.5	20.4
Non-Hydrocarbon Exports (% of GDP)	4.2	3.6

Source: Adapted from IMF (2023) and World Bank (2023).

The widening of the twin deficits (fiscal and current account) in 2023 signals an urgent need for fiscal consolidation and structural reform to ensure long-term macroeconomic stability. This is visually represented in Figure 1.

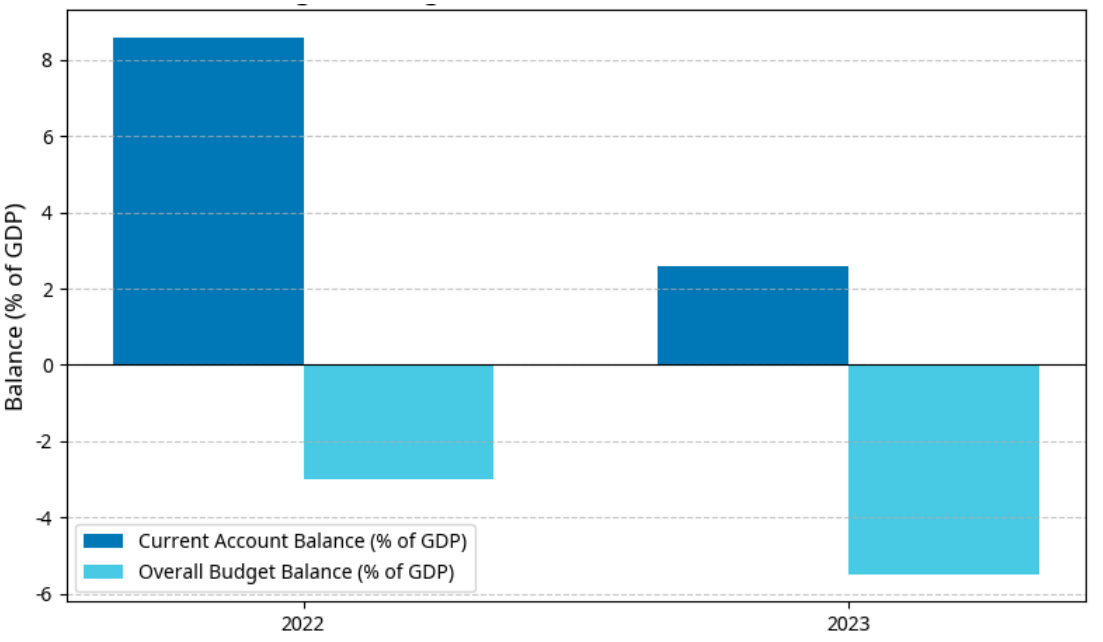

Figure 1: Algeria's Twin Balances (2022–2023)

Source: Author's calculation based on IMF (2023) and World Bank (2023) data.

4. The Productivity Paradox: Heterogeneous Gains and Misallocated Labor

The central theme for sustainable diversification lies in accelerating productivity gains across the non-hydrocarbon economy (Carvalho & Gabaix, 2013). An analysis of sectoral productivity reveals a complex and paradoxical landscape.

4.1. Sectoral Productivity Performance

Productivity growth in Algeria between 2004 and 2023 has been highly heterogeneous, contrasting sharply with trends observed in Low- and Middle-Income Countries (LMICs) (World Bank, 2023).

As shown in Figure 2, Algeria's Agriculture sector has been a remarkable outperformer, with an annualized productivity growth of 7.5%, significantly higher than the 3.0% average for LMICs. This success is largely attributed to targeted public programs, such as the National Agricultural and Rural Development Program (PNDAR), and the decline in agricultural employment, which concentrates production among more efficient units (Zemri, 2023). Similarly, the Construction sector recorded strong gains (4.8% vs. 2.9% for LMICs), primarily driven by sustained public capital expenditure.

Conversely, sectors crucial for long-term diversification exhibit worrying underperformance: **Manufacturing:** Productivity growth was a mere 1.5%, lagging far behind the 4.2% average for LMICs. This weakness is partly attributed to the dominance and lower efficiency of State-Owned Enterprises (SOEs) in this sector.

Low-Value-Added (Low-VA) Services: Growth was limited to 1.4%, well below the 3.9% average for LMICs. **High-Value-Added (High-VA) Services** (e.g., transport, communications, finance): While outperforming LMICs (2.1% vs. 1.3%), the sector remains small relative to its potential.

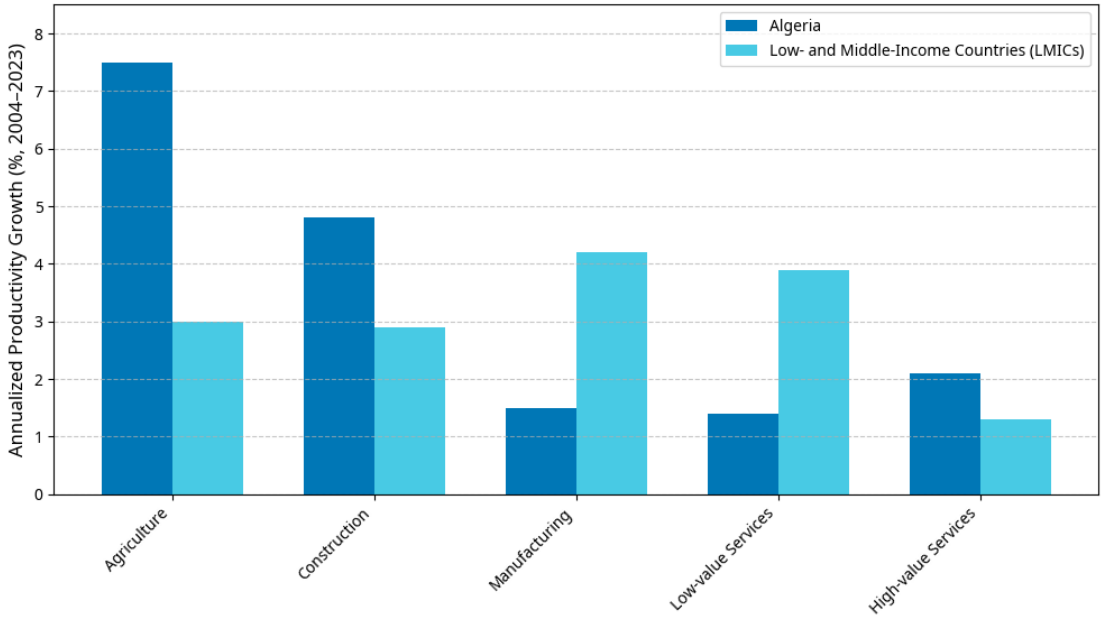

Figure 2: Comparative Sectoral Labor Productivity Growth (2004–2023)
Source: Author's calculation based on World Bank (2023) data.

4.2. The Misallocation of Labor and Capital

The productivity paradox is rooted in the misallocation of factors of production. The strong growth in the non-hydrocarbon economy has been driven by the Construction and Low-VA Services sectors, which are characterized by low productivity and high labor absorption. This pattern is a direct consequence of the public spending model: **1. Public Investment**: Large-scale infrastructure projects channel capital and labor into the Construction sector. **2. Public Employment**: The state remains a major employer, particularly in non-commercial services, which are inherently low-productivity. **3. Lack of Reallocation**: High-productivity sectors (like Manufacturing and High-VA Services) are unable to attract the necessary labor and capital due to structural rigidities, regulatory hurdles, and a lack of competitive financing.

This misallocation acts as a drag on aggregate productivity growth. The structural transformation required for diversification is not simply about growing the non-hydrocarbon economy, but about reallocating resources from low-productivity to high-productivity activities (McMillan & Rodrik, 2011).

5. Policy Implications: Pathways for Diversification

Achieving sustainable diversification requires a coordinated policy response that addresses both the fiscal vulnerabilities and the productivity paradox.

5.1. Fiscal Consolidation and Expenditure Quality

The immediate priority is to reduce the structural fiscal deficit. This involves: **Targeted Subsidies**: Reforming the extensive subsidy system to reduce waste and reallocate resources towards productive investments. **Non-Hydrocarbon Revenue**: Expanding the tax base and improving tax collection efficiency to reduce reliance on volatile oil revenues. **Quality of Spending**: Shifting public expenditure away from consumption and untargeted transfers towards investments that directly enhance long-term productivity, such as education, R&D, and strategic infrastructure (IMF, 2023).

5.2. Strategic Labor and Capital Reallocation

The core of the diversification strategy must be the active promotion of labor and capital reallocation towards high-productivity sectors.

Table 2
Policy Matrix for Strategic Reallocation

Policy Area	Objective	Mechanism
Manufacturing	Boost competitiveness and efficiency.	Targeted industrial policy, privatization of inefficient SOEs, and facilitating access to international markets.
High-VA Services	Foster growth in knowledge-intensive sectors.	Investment in digital infrastructure, regulatory reform to attract foreign direct investment (FDI), and specialized skills training.
Labor Market	Enhance mobility and skills matching.	Vocational training programs aligned with high-growth sector needs, and reducing regulatory barriers to firm entry and exit.
Finance	Channel capital to productive firms.	Developing non-bank financial institutions and improving the efficiency of the banking sector to reduce the bias towards public sector lending.

6. Conclusion

Algeria's path to sustainable economic diversification is challenging but clear. The country must resolve the productivity paradox by actively reallocating labor and capital towards high-productivity, non-hydrocarbon sectors, particularly manufacturing and high-value services. This structural shift must be underpinned by a disciplined fiscal policy that mitigates the risks posed by the twin deficits and ensures the quality of public spending. By focusing on these core structural reforms,

Algeria can leverage its resource wealth to build a resilient, diversified, and prosperous economy for the future.

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