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Determinants of Economic Growth in a Resource-Dependent Economy: An Endogenous Approach to Libya (1990–2023)

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محددات النمو الاقتصادي في اقتصاد معتمد على الموارد: مقاربة النمو الداخلي لحالة ليبيا (1990-2023)

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:Abstract

This study investigates the primary determinants of economic growth in Libya from 1990 to 2023 through the lens of endogenous growth theory. Utilizing an Autoregressive Distributed Lag (ARDL) bounds testing approach, the research empirically evaluates the short- and long-run impacts of macroeconomic variables—including Foreign Direct Investment (FDI), inflation, government expenditure, trade openness, gross fixed capital formation (GFCF), and oil prices—on real GDP growth. The empirical findings reveal that while trade openness and oil prices exert a statistically significant positive effect on economic expansion, variables such as government expenditure, GFCF, and FDI present counterintuitive negative coefficients. These results underscore the severe structural inefficiencies, institutional deficits, and "resource curse" phenomena prevalent in the Libyan economy. The paper concludes that to achieve sustainable endogenous growth, Libya must transcend its heavy reliance on hydrocarbon revenues by improving institutional quality, redirecting public expenditure toward human capital and R&D, and creating an absorptive environment for productive capital spillovers.

Keywords: Endogenous Growth, ARDL Model, Libyan Economy, Foreign Direct Investment, Macroeconomic Determinants, Resource Curse.

الملخص:

تبحث هذه الدراسة في المحددات الأساسية للنمو الاقتصادي في ليبيا خلال الفترة من 1990 إلى 2023 من منظور نظرية النمو الداخلي. وباستخدام نهج اختبار الحدود لنموذج الانحدار الذاتي للفجوات الزمنية الموزعة(ARDL) ، يقيّم البحث تجريبياً الآثار قصيرة وطويلة الأجل لمتغيرات الاقتصاد الكلي — بما في ذلك الاستثمار الأجنبي المباشر(FDI) ، والتضخم، والإنفاق الحكومي، والانفتاح التجاري، وإجمالي تكوين رأس المال الثابت(GFCF) ، وأسعار النفط — على نمو الناتج المحلي الإجمالي الحقيقي. وتكشف النتائج التجريبية أنه في حين أن الانفتاح التجاري وأسعار النفط يمارسان تأثيراً إيجابياً ذا دلالة إحصائية على التوسع الاقتصادي، فإن متغيرات مثل الإنفاق الحكومي، وإجمالي تكوين رأس المال الثابت، والاستثمار الأجنبي المباشر تُظهر معاملات سلبية على عكس المتوقع (غير بديهية). وتؤكد هذه النتائج على أوجه القصور الهيكلية الحادة، والضعف المؤسسي، وظاهرة "لعنة الموارد" السائدة في الاقتصاد الليبي. وتخلص الورقة إلى أنه من أجل تحقيق نمو

داخلي مستدام، يجب على ليبيا تجاوز اعتمادها المفرط على عائدات الهيدروكربونات (النفط والغاز) من خلال تحسين الجودة المؤسسية، وإعادة توجيه الإنفاق العام نحو رأس المال البشري والبحث والتطوير(R&D) ، وخلق بيئة استيعابية للآثار الإيجابية غير المباشرة لرأس المال المُنتج.

الكلمات المفتاحية: النمو الداخلي، نموذج الانحدار الذاتي للفجوات الزمنية الموزعة(ARDL) ، الاقتصاد الليبي، الاستثمار الأجنبي المباشر، محددات الاقتصاد الكلي، لعنة الموارد.

Full text

1. Introduction

In macroeconomics, the determinants of economic growth have remained elusive. The neoclassical growth model popularised by Robert Solow (1956), highlights capital accumulation, technological progress and population growth as key catalysts driving long-term economic growth. The endogenous variables in this model are physical capital stock and output per worker.

The long-term economic growth in the Solow growth model is exogenously determined by technological change and is independent of variables such as the total level of savings, growth of the labour force and schooling rates (Bernanke &Gürkaynak, 2002). A general prediction of the Solow model is that an economy will always converge to a steadystate of growth, as defined by 'constant growth rates for per capita variables' (Hermansen, 2011, p. 2), which relies on the growth rate of saving and the growth rate of the labour force. Klenowand Rodriuez (1997, p. 60) note, "In the Solow model, high rates of growth occur when a country finds itself way below its steady-state path" and attribute this to the fact that capital in a closed economy is subject to diminishing returns.

The Solow growth model can be explained by the Cobb-Douglas production function, with physical capital K, labour L and technological progress A:

$$y(t) = F(K(t), A(t)L(t)) \qquad (1)$$

In this function, time influnces output only through *K*, *L* and *A*. Technology augments labour, and ALrepresents effectivelabour (Sachs & Warner, 1997). However, this model takes technological progress as exogenous. According to the model, the source of sustained growth is technological progress.

Mankiw et al. (1992) modifies the Cobb-Douglas production function to include human capital. Their study differs from Barro (1991) in that in addition to physical capital, an interaction term made up of the school enrolment rate and the working age population is included as a measure for human capital. However, this hinges on an unrealistic assumption that the quality of schooling is the same across all countries. For example, it is not the case that the quality of secondary school education in Ethiopia is commensurate with that in Germany. Specifically, the Mankiw et al. model can be formally written as:

$$\frac{Y}{N} = F(I, HL, Y_0, OP, G), (2)$$

where $\frac{Y}{N}$ is GDP per capita, I is investment in human capital, HL is human capital, Y_0 is initial level income, Op is openness to trade, and G refers to public finance-related variables.

Taking logs in order to obtain the percentage of change in growth over time, equation (1) can be estimated as follows:

$$\ln\left(\frac{Y}{N}\right) = \alpha_0 + \alpha_1 InK_{ti} + \alpha_2 In\, H_{it} + \alpha_3\, In\, Y_{0ti} + \; In\, G_{ti} + \; In\, OP_{ti} + \; \varepsilon_{it}\,, \qquad (3)$$

where $\ln\left(\frac{Y}{N}\right)$refers to the growth rate of per capita income, In refers to the natural logarithm, K refers to the change rate of investment in physical capital, H refers to the change of level of human capital, Y_0 refers to the change in initial level of income, OP refers to the change in the openness level, G refers to public finance-related variables, ε refers to the error term and the subscript it refers to country *i* at time *t*.

Mankiw et al. (1992) study the augmented Solow model in 98 countries from 1960 to 1985. [1]They find that a higher savings rate causes a higher income in the steady state, which causes a higher level of human capital. Henceforth, higher savings increases total factor productivity. This supports the findings of the Solow model in

[1]The Augmented Solow Model includes human capital as a factor of production along with capital and Labour in production (Michael, 2011).

which the differences in population growth and savings, as well as education, explain the cross-country differences in per capita income.

The majority of studies in growth literature involve a variation of the Solow model. For example, Sachs and Warner (1997) argue that slow economic growth in Africa from 1965 to 1990 can be explained by poor initial conditions[1], macroeconomic mismanagement and geography. African countries, in general, have a low level of initial income. These countries also share poor macroeconomic management in terms of inflation, openness to trade and national savings. In terms of geography, Sachs and Warner (1997) stress that a very high percentage of land in a tropical climate is a crucial geographic variable explaining growth. According to Gallup et al (1999, p. 13), there are two main channels in which tropical climate affects growth in Africa; "first, tropical countries face a wide variety of parasitic diseases that are much less prevalent in the temperate zones. Second, soils tend to be more fragile, rains less reliable and natural disasters more prevalent, all of which may make sustained agricultural growth more difficult in the tropics."

Unlike neoclassical growth theory, the new growth theory indicates that economic growth is not created by exogenous factors. Instead, it is created within the model itself. Furthermore, the new growth theory postulates that growth can takes place indefinitely without diminishing returns.

The basic assumption of new growth theory is that new knowledge permits output to grow without the need to increase physical capital stock. Specifically, this stems from the assumption that when the capital is defined broadly to include human capital, the knowledge as capital has positive externalities. Endogenous growth theory postulates that investment in technological progress and investment in human capital are key sources of economic growth (Rachmadani, et al., 2023).

Romer (1990) pioneered new growth theories. Romer's main contribution was building a model that revealed crucial ideas' role in driving growth. Furthermore, he noted that the technological change that comes from intentional investment decisions made by profit-maximizing agents drives growth. He emphasises that the rate of growth is determined by the stock of human capital. According to him, the global economy is not defined by limits and scarcity of growth, as neoclassical growth theory has suggested (Romer, 1990).

The Romer (1990) model is a model of the spill-over of knowledge[2]. This model suggests that the relation between the amount of investment and the level of knowledge can remove a decrease in the return on capital. This means that if the physical capital of the firm is increased, the firm will be able to learn to produce more efficiently, as the increase in the share capital increases the stock of knowledge. An additional important assumption in this model is that knowledge is a public good. Therefore, new knowledge is immediately accessible to the wider economy. These two assumptions change the neoclassical growth model into a model of endogenous growth.

Endogenous growth models also include the AK model, which was presented by Rebelo (1992).[3] According to him, the production function displays constant returns to both capital and to scale. The growth rate depends on the rate of savings and on the technology. According to Aghion and Howitt (2009, p. 48)"The AK model assumes that when people accumulate capital, learning by doing generates technological progress that tends to raise the marginal product of capital, thus offsetting the tendency for the marginal product to diminish when technology is unchanged".

Typologically, new growth theory can be further divided into first- and second-generation models. Romer (1990), Segerstrom et al, (1990), and Aghio and Howitt (1992) pioneered first-generation models, which are also referred to as semi-endogenous growth models. This genre assumes the existence of decreasing returns to scale in the production of knowledge, which may explain why, despite continuous growth in technological input, Total Factor Productivity (TFP) growth is not augmented. Under this assumption, the development in a semi-endogenous growth model specifies that, in the end, TFP growth will depend solely on the observed increase in the population, as it is the variable that ultimately limits the research and development employment growth.

Second-generation models are also known as Schumpeterian growth theories in the literature. Led by Peretto (1998), Howitt (1999), and Dinopoulos and Thompson (1998), they support the constant returns assumption to scale in the knowledge creation function. This process causes the effectiveness of research and development input

[1]The initial conditions are; for example, poor health, lack of information, education, and poor infrastructureandnetworks: these can hinderthe poor from bidding for jobs generated by growth (Bhide and Mehta, 2008).

[2] The idea ofspill-over is that when a company for example raises its investment in fixed capital, not only raises its own production, but also the production of neighbouring firms.

[3] The name of AK model is derived from the simple production function that is $Y=AK$.

for a large number of sectors to be diluted, which explains why TFP growth may remain constant despite the continuous increase in research and development input. Product differentiation prevents the population from having an effect of scale on the long-term economic growth, which was characteristic of the first-generation model. In addition, in the long term, constant returns to scale in knowledge creation functions ensure that the TFP growth depends on economic factors and measures of economic policy, which is a fundamental difference with respect to the semi-endogenous growth model.

In this model, with constant returns to scale in the creation of new knowledge, positive growth in the input is sufficient to cause the acceleration of productivity. This leads to economies of scale in its strong form, where economic growth is proportional to population size. Aghion and Howitt (2009, p. 17) argue that "the Schumpeterian apparatus is well suited to analyse how a country's growth performance will vary with its proximity to the technological frontier at, to what extent the country will tend to converge to that frontier, and what kinds of policy changes are needed to sustain convergence as the country approaches the frontier".

Pritchett (1996) argues that despite the growth literature making great progress, the first-generation models conflict with the perspectives and needs of policymakers for developing countries. The focus of endogenous growth models is long-term growthand incentives to broaden technological frontiers. However, Pritchett (1996) and Rao and Coovry (2009) argue that expanding long-term growth and technological frontiers are not the main concern of developing countries. Instead, these countries are more interested in the short- and medium-term growth, as well as accelerating technological catch up by existing innovations.

Recent empirical literature has increasingly applied advanced econometric techniques, such as the ARDL framework, to understand the unique structural dynamics of the Libyan economy in the post-2011 era. Elboiashi (2025) investigated the impact of foreign trade volume on sustainable development in Libya using an ARDL model, finding a robust positive relationship driven by GDP growth, though highlighting high inflation as a severely destabilizing factor. Similarly, Elfurti (2025) utilized an ARDL approach to explore FDI's impact on Libya's economic development, concluding that while FDI has theoretical potential, its current impact is heavily skewed by crude oil exports and exchange rate volatility, meaning it fails to generate the knowledge spillovers predicted by endogenous growth models.

Furthermore, studies focusing on the resource curse and fiscal policy validate the complexities of Libya's growth. Aimer (2024) confirmed that global oil price shocks remain the dominant long-term positive driver of Libyan economic growth, often overshadowing endogenous technological factors. On the fiscal side, research by Abud (2021) on government expenditure demonstrated that while current spending provides short-term positive shocks, lagged government expenditure negatively impacts growth. This points to severe administrative inefficiencies and a lack of productive capital accumulation. Collectively, these recent studies reinforce the necessity of viewing Libya's economic determinants not just through the accumulation of capital, but through the endogenous requirements of institutional quality, absorptive capacity, and human capital development.

2. Determinants of Endogenous Growth

In the literature on endogenous growth theory, various studies have investigated the determinants of economic growth. Having used different methodological viewpoints, these studies have focused on different independent parameters as a source of economic growth.

Romer (1990) develops a new growth theory, with a set of explanatory variables explaining economic growth. These include investment, population growth, human capital, physical capital, FDI inflow, population growth, inflation and government expenditure. The simple specification for the model is:

$$g_{i,t} = \beta_0 + \beta_1 FDI_{i.t} + \beta_2 POP_{i,t} + \beta_3 Op_{i,t} + \beta_4 INV_{i,t} + \beta_5 SCH_{i,t} + \beta_6 Gov_{i,t} + \beta_7 inf_{i,t} + \varepsilon_{i,t}, \quad (4)$$

where $g_{i,t}$ is the real GDP per capita growth of country i, $FDI_{i.t}$ is the FDI inflow, $POP_{i,t}$ is the population growth,$Op_{i,t}$ is openness to trade, $INV_{i,t}$is the gross domestic investment, $SCH_{i,t}$ is the level of secondary school enrolment, $Gov_{i,t}$ is government expenditure, $inf_{i,t}$ is the inflation rate and $\varepsilon_{i,t}$ is the error term. The common determinants of economic growth are reviewed below.

2.1 Physical Capital

Physical capital is one of the main factors that determine the level of growth. Physical capital refers to all the machinery and equipment that is needed in the production function. The accumulation of capital is the most direct way to explain growth. As the amount of machinery increases, the amount of production increases (Levine &Renelt, 1992).

According to Romer (1990), physical capital investment leads directly to growth, which is caused by investment in research and development creating ideas for new goods. A gross investment rate is usually used in the literature

as a proxy for physical capital accumulation. Another measure of physical capital stock is the value of buildings, machines, tools and implements, excluding the value of live assets (Barro, 1991).

2.2Human Capital

In the endogenous growth models, human capital plays a key role in affecting growth by producing new ideas. These encourage physical capital investment, which causes growth. Hence, countries with higher stocks of human capital undergo a faster rate of introduction of new goods, showing faster growth. Empirical studies on economic growth emphasize that the skills and knowledge of a nation's population are a crucial determinant of economic performance (e.g., Bergheim, 2005; Howitt 2005; Lucas, 1990).

As human capital increases labour productivity, output and employment grow. Furthermore, as the human capital is essential for the optimal use of physical capital, the increase in human capital in the economy of any country encourages investment in physical capital, which increases growth (Abbas, 2000). Among the most popular proxies for human capital that have been used in the literature are school enrolment and educational attainment as measured in years of schooling (e.g., Levine &Renelt, 1992; Benhabib& Spiegel, 2005; Caselli& Coleman, 2006; Cohen & Soto, 2007; and Hanushek&Woessmann, 2008).

2.3Government Expenditure

The growth literature also emphasizes the role of government expenditures in explaining the differences in growth rates among countries. Though government expenditure on education is usually found to increase economic growth (Bose et al., 2007), an inefficient and large government might adversely affect growth through a number of channels. Government expenditure can displace large private sector demand via its impact on credit availability. Furthermore, the taxes needed to finance government expenditures, at least in part, are often distorted, imposing efficiency losses on the economy.

Though, government expenditure has a positive effect on growth in the short term, it is likely to create a budget deficit in the long term. This leads to negative effects on growth (Alexiou, 2009). Since the long-term effect of government expenditure is not included, this variable is expected to exert some positive impact on growth (Mauro, 1995).

In the literature, government expenditure is measured by the average share of government consumption as a percentage of GDP and the total government expenditure (Ahmad et al., 2012; Barro, 1991). Real government expenditure is also measured as "the Public Authorities spending on goods and services (excluding transfer payments), i.e. consumption and gross fixed capital formation" (Loizides&Vamvoukas, 2005 p. 129).

2.4Openness

It is expected that openness positively affects the growth rate, as increased trade can be seen as a sign of a well-functioning economy that enjoys growth. This is supported by Barro(1995), who further claims that countries that are more open to trade have a tendency to be richer.

The growth theory refers to three different channels through which openness to trade may increase the growth rate of countries: through diffusion of intermediate goods or technologies, through diffusion of general knowledge, and through an expansion of the market for output from innovation. In the literature, openness is measured as the ratio of trade volume in GDP and as the ratio of exports or the ratio of imports in GDP. Openness is the total trade, which is measured as a percentage of GDP (the Share of imports plus exports to GDP (Heston et al., 2006).

2.5Investment

In endogenous growth models, investment is expected to encourage economic growth. The positive effect of investment on growth rate is because investment does not suffer from decreasing returns to scale at the aggregate level as the positive productivity pullovers are related to higher levels of private capital. One of the basic assumptions in endogenous growth models is that new investment does not merely create new machines. Instead, it also generates new means for doing things. Further, investment raises intangible capital stock, including knowledge. Investment is measured by the gross or net fixed capital formation (e.g., Barro, 1996; Blomstrom et al., 1993; Levine and Renelt, 1992).

2.6Foreign Direct Investment

Foreign direct investment is an instrument that enables technology transfers and knowledge spill-overs between industries and countries. In endogenous growth models, FDI increases the rate of economic growth by triggering technological propagation from the developed countries to the host once (De Mello, 1999). The endogenous

growth model predicts that FDI increases growth by stimulating the introduction of new technologies and input into the production process.

Several channels have been identified by the literature through which FDI accelerate economic growth. Endogenous growth theory suggests that technological advancement encourages economic growth by generating externalities that recompense for decreasing returns to capital (Rebelo, 1991). FDI, therefore, boosts growth by permitting host countries access to advanced technologies that do not exist locally.

Key measures of FDI that have been used in the literature are FDI stocks and FDI flows (e.g., Alfaro et al., 2004; Barro, 1990; Carkovic& Levine, 2002; Lucas, 1988).

2.7Population Growth

Endogenous growth models suggest that rapid population growth tends to influence economic growth negatively, particularly in developing countries (e.g., Barro 1991 &Sala-i-Martin, 2004). The first problem caused by population growth is capital dilution. In developing countries, the population is increasing dramatically. An increase in population leads to a fall in capital per worker, as the addition of more workers can reduce the amount of capital available to each worker. Another negative impact of population growth on economic growth is the problem of the shortage of resources. Natural resources are limited and cannot be produced (Headey& Hodge, 2009; Sachs, 2008).

Endogenous growth models predict large and persistent negative effects of population growth on economic growth. This influence is more unfavourable in developing countries due to the high dilution of resources and the effects of leakage of resources, as well as the poor policy environments (Klasen& Lawson, 2007). Some measures of population growth have been used in the literature, including total population growth and labour force growth.

2.8Inflation

It is generally accepted that inflation has a negative impact on growth once it exceeds the threshold level. However, it is generally expected to have a positive impact on growth below the threshold level [1] (Andrés & Hernando, (1999) and Barro, 1996). Some (e.g., Barro, 1995; Fischer, 1993; Khan and Senhadji, 2000) find a non-linear threshold effect in the negative influences of inflation on growth. That is, at lower rates of inflation, the relationship between inflation and growth is not significant or positive; however, when inflation reaches higher levels, it has substantial negative consequences on growth. Inflation is measured in the literature as the percentage changes in the GDP deflator as well as the annual increase in the Consumer Price Index.

Methodology

This study employs a quantitative research design to investigate the determinants of economic growth in Libya. Given the time-series nature of the data and the specific characteristics of the Libyan economy—notably its heavy reliance on oil exports—the Autoregressive Distributed Lag (ARDL) model is adopted.

3.1 Data Sources and Variable Selection

The analysis utilizes annual time-series data covering the period from 1990 to 2023. Data were primarily sourced from the World Bank's World Development Indicators (WDI) and the International Monetary Fund (IMF).

Table 1: Data Definition And Sources

Variable	Description	Proxy
RGDPG	Economic Growth	Real GDP Growth (Annual %)
FDI	Foreign Investment	FDI net inflows (% of GDP)
INF	Macroeconomic Stability	Inflation, consumer prices (Annual %)
GEXP	Government Size	Govt consumption expenditure (% of GDP)
OPEN	Trade Openness	Exports plus Imports (% of GDP)

[1]The threshold level of inflation is the level at which inflation starts to have a negative effect on growth. This level ranges from 9 to 11 (Bruno and Easterly, 1998).

GFCF	Physical Capital	Gross Fixed Capital Formation (% of GDP)
OILP	External Shocks	Brent Crude Oil Prices (Annual Average)

3.2 Econometric Analysis and Results

The ARDL model estimation was performed to capture the long-run and short-run dynamics of the Libyan economy. The optimal lag structure was determined to be ARDL(1, 1, 1, 1, 1, 0, 1) based on the AIC.

3.2.1 Unit Root Tests

Prior to ARDL model estimation, **Augmented Dickey-Fuller (ADF)** tests were performed on all variables. The purpose of these tests is to determine the order of integration of each series (i.e., whether they are stationary at levels, I(0), or after first differencing, I(1)). The ARDL bounds testing approach is valid for a mix of I(0) and I(1) variables, but not for I(2) variables. The ADF tests confirmed that no variable was integrated of order I(2), thus validating the use of the ARDL framework.

3.2.2 Optimal Lag Selection

The ARDL_select_order function from the stats model's library was used to determine the optimal lag lengths for both the dependent and independent variables. The Akaike Information Criterion (AIC) was employed as the selection criterion, aiming to find the model that best balances goodness-of-fit with parsimony

This indicates that the current Real GDP Growth is influenced by its own previous year's value, and by the current and previous year's values of FDI, Inflation, Government Expenditure, Trade Openness, and Oil Prices, as well as the current year's Gross Fixed Capital Formation.

4. **Model Estimation**

The ARDL model was then estimated using the selected optimal lag structure

Table 2: ARDL Model Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	40.1230	10.316	3.889	0.001***
RGDPG(-1)	-0.3572	0.074	-4.814	0.000***
FDI(0)	1.6675	1.628	1.024	0.318
FDI(-1)	-6.6026	1.787	-3.695	0.001***
INF(0)	1.1835	0.345	3.433	0.003***
GEXP(0)	-2.2005	0.276	-7.960	0.000***
OPEN(0)	0.2189	0.086	2.543	0.019**
GFCF(0)	-1.7076	0.563	-3.034	0.007***
OILP(-1)	0.6091	0.125	4.870	0.000***

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

4.3 Discussion of Findings

The estimation results provide critical insights into the endogenous growth mechanics of the Libyan economy, revealing a stark contrast between theoretical expectations and the reality of a conflict-affected, resource-dependent state:

Oil Prices (0.6091) and Trade Openness (0.2189): The positive coefficients for lagged oil prices and trade openness reflect Libya's status as a highly rentier economy. Trade openness facilitates the import of essential capital goods and technology, while oil revenues directly inject capital into the economy. However, this confirms a reliance on exogenous market shocks rather than true endogenous technological progress or domestic innovation.

Government Expenditure (-2.2005): Contrary to simple Keynesian assumptions but strongly aligning with Barro's (1990) endogenous growth model of unproductive government spending, the negative impact of public expenditure highlights severe fiscal inefficiencies. In Libya, public spending is heavily skewed toward consumptive recurring expenditures (public sector salaries and subsidies) rather than productive investments in human capital, R&D, or infrastructure. This misallocation crowds out private investment and hinders long-term endogenous growth.

Gross Fixed Capital Formation (-1.7076) & FDI (-6.6026): The negative coefficients for GFCF and lagged FDI are highly indicative of institutional decay and the "resource curse." According to endogenous growth theory, physical capital and FDI should drive growth through technology transfers and efficiency gains (Romer, 1986; Ertimi et al., 2025). However, capital formation in Libya has been frequently destroyed or misallocated due to political instability and a lack of absorptive capacity. Furthermore, FDI in Libya operates almost exclusively within the extractive hydrocarbon enclave. It fails to generate positive spillovers, forward/backward linkages, or skills transfers to the broader domestic market, rendering its overall impact on structural economic growth negative.

Inflation (1.1835): The positive relationship with inflation in this specific context reflects demand-pull dynamics. Government distribution of oil wealth increases nominal consumption in a severely supply-constrained environment, artificially inflating short-term GDP figures. However, as noted in recent literature, this does not represent sustainable, real endogenous growth and often exacerbates economic inequality.

5. Conclusion and Policy Recommendations

This paper has empirically evaluated the determinants of economic growth in Libya from 1990 to 2023 using an ARDL bounds testing approach, contextualized within the framework of endogenous growth theory. While traditional endogenous models posit that capital accumulation, government investment, and foreign direct investment should unequivocally drive economic expansion through knowledge spillovers and efficiency, the Libyan context presents a striking paradox.

The empirical results reveal that oil prices and trade openness remain the primary engines of economic activity. Conversely, the fundamental endogenous drivers of a modern economy—gross fixed capital formation, government expenditure, and FDI—exhibit negative impacts on real GDP growth. These findings strongly suggest that the mere accumulation of physical capital or the influx of public funds is vastly insufficient for sustainable development in the absence of robust institutions and absorptive capacity. The structural inefficiencies, exacerbated by political instability and over-reliance on hydrocarbon rents, have trapped Libya in a resource-dependent cycle that actively stifles domestic technological progress and human capital development.

To transition from volatile, exogenous resource-driven output toward genuine, sustainable endogenous growth, several critical policy interventions are required:

1- Restructuring Public Expenditure: Policymakers must urgently pivot government spending away from consumptive subsidies and bloated public sector wages. Funds must be redirected toward productive endogenous drivers: education, healthcare, and digital/physical infrastructure, which build the human capital necessary for long-term innovation.

2- Institutional Reform and Governance: To reverse the negative impact of physical capital investments and FDI, Libya must improve its institutional environment. Ensuring political stability, enforcing property rights, and reducing corruption are paramount to transforming FDI from an extractive enclave activity into a catalyst for technological transfer.

3- Economic Diversification: The positive reliance on trade openness must be leveraged to diversify exports away from crude oil. Developing the non-oil private sector, particularly in manufacturing and services, will create the necessary economic linkages to absorb foreign technology and stimulate localized endogenous growth.

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