

Globalisation and financial development as potential drivers of economic growth in Algeria

Omar HEMCHE¹, Omar DJAFRI ^{2*}, Fatema DAHMANI³

¹ Higher School of Management-Tlemcen -, Algeria, hemche_o@hotmail.com

² University of Ain Temouchent, Algeria omar.djafri@univ-temouchent.edu.dz

³ Higher School of Management-Tlemcen -, Algeria, fdahmani503@gmail.com

Received: 8/31/2025

Accepted: 10/12/2025

Published: 11/10/2025

Abstract:

This study analyses the impact of globalisation, financial development and fixed capital accumulation on economic growth in Algeria over the period 1970-2023 using the ARDL approach and FMOLS and CCR tests. The results show that globalisation and financial development have a positive and significant effect on growth, while fixed capital has a negative impact, reflecting inefficient investment. Public spending, on the other hand, contributes positively to growth. The study recommends adopting policies that promote economic openness, financial system efficiency and better targeting of investment towards productive sectors to ensure sustainable growth.

Keywords: Economic growth, globalisation, financial development, fixed capital and Algeria

JEL Classification Codes : F43; O16; O55

* : *Corresponding author.*

1. INTRODUCTION

Globalisation and financial development have recently emerged as major determinants of contemporary economic dynamics. Globalisation, a complex concept with multiple dimensions — economic, financial and political — has profoundly transformed the ways in which countries interact. It is often praised for promoting free trade, lifting trade restrictions, facilitating capital flows and stimulating international migration (Yameogo et al., 2021). It is now an unavoidable aspect of the modern world, generating both opportunities and challenges due to the increasing interconnectedness of economies (Hordofa, 2024). With the advent of the ‘era of globalisation’, access to information and technology has expanded, while international competition and efficiency requirements have intensified (Fuinhas et al., 2019). Dreher (2006) points out that globalisation promotes the expansion and prosperity of open economies, suggesting its potential role in stimulating economic development. Recent empirical studies confirm that globalisation, financial development and institutional quality significantly influence the pace of economic development in both developed and developing countries (Nasreen et al., 2020).

From a theoretical perspective, a functional financial system promotes economic development by facilitating the allocation of resources to productive sectors. By improving economic efficiency and stimulating physical capital accumulation, financial development contributes directly to growth (Abbas et al., 2022). Beck (2002) shows that trade openness and financial development are closely linked to sustained economic growth. Developing countries with advanced financial systems tend to experience faster GDP per capita growth, while those with fragile financial sectors perform less well.

The literature distinguishes several channels through which financial development stimulates growth: attracting foreign direct investment (FDI), improving banking and stock market activities, and supporting research and development (Mahalik et al., 2017; Charfeddine & Khediri, 2016). In this context, an efficient financial market is considered a necessary but not sufficient condition for achieving sustainable economic growth (Asante et al., 2023). In addition, a sound financial system promotes innovation, improves investment returns and reduces information asymmetries (Shahbaz & Lean, 2012).

However, in many developing countries, the backwardness of the financial sector limits its ability to fully support economic growth (Fung, 2009). Financial constraints also hinder the diffusion of technology, thereby contributing to the growth gaps observed between countries (Aghion et al., 2005). The example of India illustrates how globalisation and financial development can act as catalysts in a transition economy (Sethi et al., 2020). In general, the literature recognises that globalisation has ambivalent effects: it promotes the emergence of new markets, the growth of trade and the diffusion of technologies, but it can also accentuate income inequalities and environmental degradation (Takefman, 2023).

In Africa, the debate is particularly heated. Some countries are managing to take advantage of globalisation to boost their growth, while others are suffering its negative effects, particularly in terms of poverty and inequality (Barry, 2010; Kilic, 2015). Several studies have analysed separately the contribution of globalisation (Dreher, 2006; Samimi & Jenatabadi, 2014; Savrul & Incekara, 2017) or financial development (Hussein et al., 2020; Abeka et al., 2021) to economic growth. Other research has explored their combined impact, albeit in a limited way (Kazar & Kazar, 2016; Baidoo et al., 2023; Fuinhas et al., 2019; Kandil et al., 2017).

It is within this framework that the present study aims to contribute to the literature by proposing a two-pronged approach. First, it analyses the joint effect of globalisation and financial development on economic growth in Algeria, thus constituting a pioneering work in this specific context. Second, it enriches existing work by simultaneously considering public expenditure and inflation as major control variables. In order to achieve the main objective of this study, the following question was asked: To what extent do globalisation, fixed capital and financial development influence economic growth in Algeria? The results of this research will be useful in developing appropriate policies in the areas of financial economics and economic globalisation, with a view to promoting sustainable development based on equitable and sustainable growth.

To achieve this objective, several econometric methods are used, including the ARDL (Autoregressive Distributed Lag) model to examine long-term relationships, as well as FMOLS (Fully Modified Ordinary Least Squares) and CCR (Canonical Cointegration Regression) estimators to test the robustness of the results.

Finally, the structure of the study is as follows: Section 1 presents the literature review, Section 2 outlines the methodology, data description and model specification, Section 3 analyses the empirical results, and the final section concludes by highlighting the main implications and recommendations.

2. Literature review

This study examines the relationship between globalisation, financial development and economic growth, drawing on theoretical foundations from growth theory, trade theory and financial intermediation theory. The relationship between financial development, globalisation and economic growth is a complex issue in theoretical and empirical research.

According to Solow's neoclassical growth theory (1956), labour, capital and technology are the main factors driving economic growth. According to this growth hypothesis, the accumulation and use of capital in the economy are essential for stimulating economic growth. Furthermore, the interaction between labour and capital determines the level of production in an economy. Technology, for its part, improves labour productivity, thereby increasing its production potential.

The endogenous growth models developed by Grossman and Helpman (1991) and Romer (1994) examined the relationship between international trade and economic growth, showing that the volume of international trade is correlated with the flow of technological knowledge and the introduction of new goods. According to the international trade framework, the theory of comparative advantage emphasises the goods that a nation can produce more easily or at lower cost than other countries. Thus, nations trade with other countries by supplying the products for which they have a relative advantage.

Theoretical analyses of growth present contrasting views on the link between globalisation and development. The neoliberal school considers that, despite the replacement of traditional jobs and lower wages for unskilled labour, global trade, foreign investment and technological innovation improve production efficiency and create unprecedented levels of wealth (Fosah et al., 2023). Dreher (2006) introduced the globalisation index and argued that globalisation promotes the expansion and prosperity of open economies, suggesting that it can be beneficial for a country's economic development.

According to the theory of financial intermediation, Schumpeter (1911) argued that financial development, by facilitating transactions and mobilising savings, stimulates economic growth. Economists paid relatively little attention to the role of financial development and trade openness in economic growth in early development research (Shaheen et al., 2011). Mishkin (2009) emphasises that globalisation is one of the key drivers of institutional reform in developing countries, thereby catalysing financial development and economic growth. By facilitating and opening up access to flows of goods and services from emerging countries to developed country markets, the latter can help to support this process.

From a theoretical perspective, a functional financial system promotes financial development. Financial resources are allocated to industrial sectors through a financial system structured to promote economic efficiency, physical capital accumulation and growth (Abbas et al., 2022).

The influence of financial development and globalisation on economic growth has been addressed in numerous studies, either jointly or separately. Kandil et al. (2017) showed, using the ARDL method, that financial development and capital stimulate economic growth in India and China. However, globalisation promotes growth in India while slowing it down in China. Sahoo and Sethi (2023) found that financial globalisation and trade openness stimulate economic growth in South Asian countries, based on data covering the period 1990–2017. Baidoo et al. (2023), also using ARDL, found that economic globalisation and capital slow growth in Ghana, while public spending promotes economic growth.

Hordofa (2024), using the ARDL method, found that the globalisation coefficient is positively but weakly related to economic growth in Ethiopia. Furthermore, the gross

fixed capital formation coefficient is positively associated with economic growth. According to the results of Kilic's (2015) analysis, economic globalisation and political globalisation had a favourable impact on the growth rates of the developing countries studied, while social globalisation had a negative effect. The study also showed that, compared to social globalisation, economic and political globalisation may be more beneficial to the growth process of least developed countries. The benefits of globalisation are mainly related to economic aspects, while its risks mainly concern political and social dimensions (Savrul & Incekara, 2017). They indicated that the social dimensions of globalisation have positive effects on economic growth, while the interaction between political globalisation and economic growth proved to be insignificant in ASEAN countries.

Dreher (2006), constructing a globalisation index based on data from 123 countries, found that globalisation promotes economic growth. In a similar vein, Acheampong et al. (2021) examined the effect of the three dimensions of globalisation on the relationship between energy consumption and economic growth and found that the economic and political dimensions of globalisation reduce economic growth, while the social dimension accelerates it. In the same vein, Zhang et al. (2023) studied the influence of the dimensions of globalisation on the relationship between economic growth and renewable energy consumption and concluded that the economic and political dimensions strongly inhibit growth, while social globalisation encourages it.

According to Abeka et al. (2021), empirical literature suggests that, in sub-Saharan African economies with strong telecommunications networks, financial development has a stronger impact on economic growth, confirming that financial development is an essential lever for stimulating growth. Some economists have drawn attention to the potential risks associated with financial globalisation, which may mitigate its benefits. On the other hand, many economists have highlighted the advantages of financial globalisation for growth and encouraged developing countries to consider opening their capital markets to external flows (Bhanumurthy & Kumawat, 2020). The study by Abeka et al. (2021) concludes that improving financial development through telecommunications infrastructure in sub-Saharan African economies would accelerate economic growth. Bhanumurthy & Kumawat (2020) find a weak causality from financial globalisation to growth in South Asian economies.

Samimi & Jenatabadi (2014) show that economic globalisation has a significant relationship with the economic growth of OIC member countries. However, their results suggest that this beneficial effect is amplified in countries with a highly skilled workforce and sophisticated financial systems. Furthermore, globalisation is beneficial for high- and middle-income countries, but does not bring benefits to low-income countries. Finally, a study by Yazdi & Shakouri (2017) reveals that the globalisation index contributes to improved growth.

The terms *globalisation* and *trade openness* are often used interchangeably to explain the impact of international trade. Some studies have shown a positive influence of trade openness (Rahman et al., 2015; Rani and Kumar, 2018; Bist, 2018; Goswami, 2013; Yucel, 2009; Asghar & Hussain, 2014; Shahbaz, 2012). Other studies have revealed that financial development stimulates growth (Rahman et al., 2015; Lawal et al., 2016; Rani and Kumar, 2018; Bist, 2018; Goswami, 2013; Asghar & Hussain, 2014; Shahbaz, 2012; Polat et al., 2015; Elfaki et al., 2021), while some have highlighted a negative relationship between trade openness and economic growth (Shaheen et al., 2011; Lawal et al., 2016; Polat et al., 2015; Elfaki et al., 2021).

Furthermore, gross fixed capital formation is a key factor in stimulating economic growth, as demonstrated by several studies (Rani & Kumar, 2018; Goswami, 2013; Asghar & Hussain, 2014). In addition, Yucel (2009) observed that financial development hinders economic growth. However, the most recent studies provide evidence confirming that financial development and trade openness promote growth (Sghaier, 2021; Radmehr et al., 2022).

In the case of Sudan, Ali (2013) used the ARDL (autoregressive distributed lag) model to study the interaction between financial development and economic growth over the period 1970–2011. Empirical data showed that liquid liabilities and domestic credit to the private sector had a positive long-term effect on economic growth. However, there is a negative correlation between trade openness, money supply and economic growth. Furthermore, Mohamad (2008), also applying the ARDL model to analyse the influence of financial development on the Sudanese economy, highlighted a negative relationship between money supply and real GDP. According to this analysis, the link between financial development and economic growth in Sudan appears weak.

Ali (2013) and Mohamad (2008) attribute this limited correlation to inefficient resource allocation by banks, the absence of a favourable investment environment, and weak capital adequacy. In addition, high bank lending costs result from a lack of competition between institutions. Finally, Arabi (2014) found, through empirical analysis, a causal relationship between financial development and economic growth.

3. Specifications and data

The potential contributions of globalisation and financial development to economic growth in Algeria over the period from 1970 to 2021. Globalisation, financial development and gross fixed capital formation are used as explanatory variables to serve the purpose of the study. In addition, this study has been enriched by the integration of financial development and globalisation as relevant economic factors promoting economic growth, with reference to the literature reviewed. Public expenditure and the inflation rate are used as control variables.

$$GDP_t = f(K_t, FD_t, GI_t, GOV_t, INF_t, \varepsilon_t) \quad (1)$$

For analysis purposes, equation (1) is converted into a natural logarithm formula as follows:

$$LGDP = \gamma_0 + \gamma_1 LK_t + \gamma_2 LFD_t + \gamma_3 LGI_t + \gamma_4 LGOV_t + \gamma_5 LINFL_t + \varepsilon_t \quad (2)$$

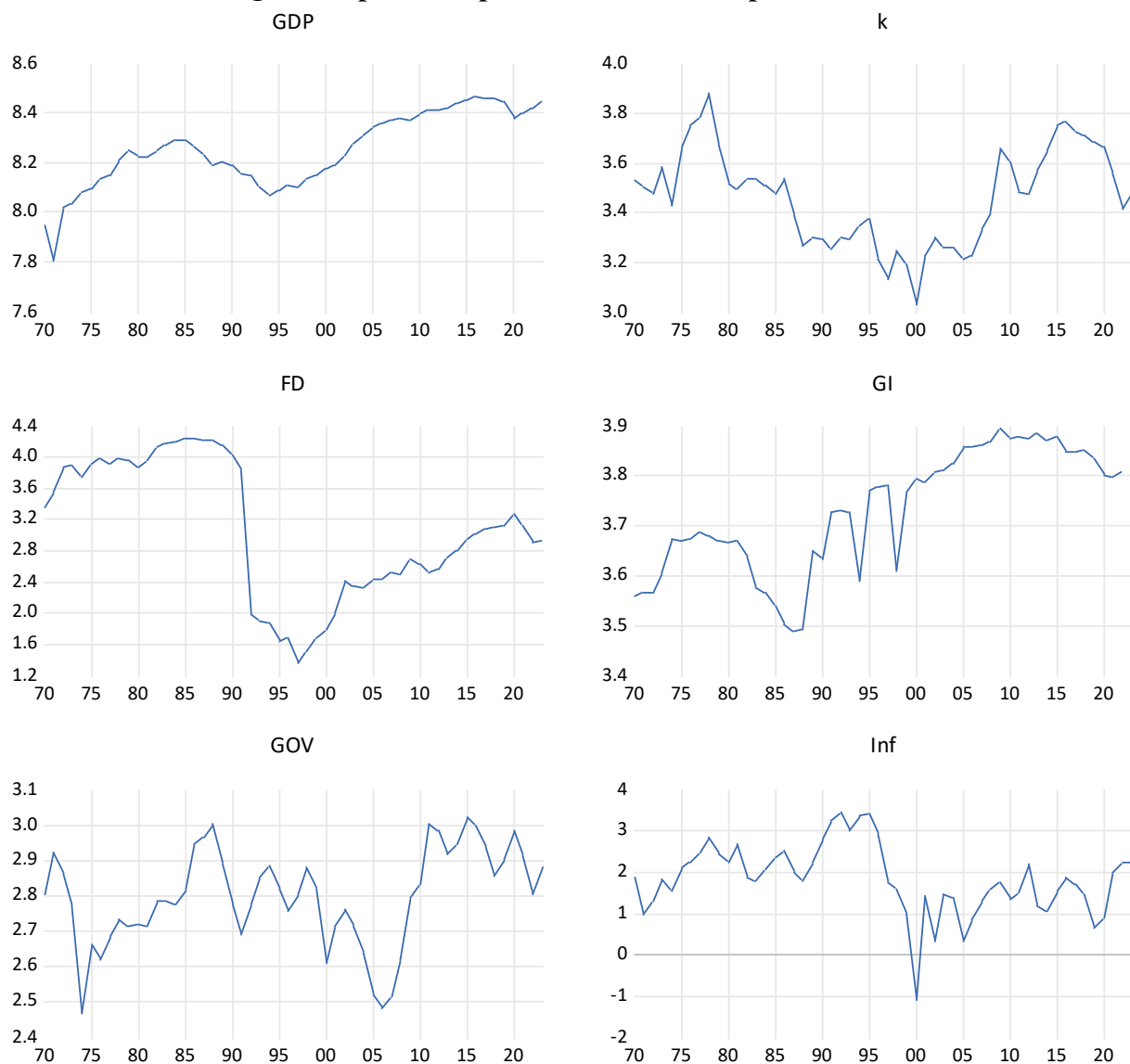
Where **L** represents the natural logarithm, **t** refers to time, **GDP** symbolises economic growth, **K** represents gross fixed capital formation, **FD** stands for financial development, **GI** corresponds to the globalisation index, **GOV** is public expenditure, **INF** symbolises inflation, and ε_t represents the standard error term or residual, used as a proxy for total factor productivity.

This study will use quantitative analysis, structured on the basis of previous work (Nasreen et al., 2020), (Yameogo et al., 2021) (Abbas et al., 2022), (Wen et al., 2022), Ahmed and Elfaki (2023), (Hordofa, 2024) to examine the effects of financial development and globalisation on growth. We use a parametric econometric technique to develop an improved version of the extensive growth theory.

Depending on data availability, the current analysis uses data from 1970 to 2023. Economic growth, as the dependent variable, is measured by GDP per capita in constant 2015 dollars. Gross fixed capital formation is used to represent physical capital. Financial development is measured by domestic credit to the private sector. Globalisation is captured by the KOF Globalisation Index. Public expenditure is measured by final consumption of general government as a percentage of GDP. The inflation rate is represented by the consumer price index. Data for the globalisation index are from the Swiss Economic Institute KOF (Gygli et al., 2019). Other data were collected from the World Development Indicators (WDI) published by the World Bank. Additional information on data and sources is presented in Table 01.

Table 1. Presentation of sample variables

Variable	Définition	Source
GDP	GDP per capita in constant 2015 dollars	Word Bank
K	Gross fixed capital formation	Word Bank
FD	Credit granted to the private sector	Word Bank
INFL	Consumer price inflation	Word Bank
GOV	Final consumption expenditure of general	Word Bank
GI	KOF Globalisation Index	KOF Swiss Economic Institute

Fig.1. Graphical representation of sample variables

Sources: Calculated by the authors using Eviews 13

We will use a multi-step methodology to test this relationship. First, we use the Augmented Dickey–Fuller (ADF) (1979, 1981) and Phillips and Perron (1988) tests to verify the unit root hypothesis among the series.

In the second stage, we will apply the ARDL (Autoregressive Distributed Lag) approach to cointegration (bound testing methodology) developed by Pesaran et al. (2001).

The ARDL method was used because of its many features. According to Pesaran et al. (2001), the ARDL technique is preferable to other methods because it is suitable for studies with small samples, offers flexibility in the choice of lag structure, is appropriate when variables are integrated of different orders $I(0)$ and $I(1)$, and allows long-term and short-term relationships between variables to be distinguished.

The ARDL cointegration approach suggested by Pesaran et al. (2001) was applied to observe the persistent relationship linking the variables. With regard to the order of

integration, this cointegration test offers several advantages over standard techniques (Raihan et al., 2023d; Voumik et al., 2023b). If it is determined that the factors remain constant at integration order 1 or 0, then this methodology is applied. The ARDL simulation uses a general-to-specific modelling framework and incorporates an appropriate number of lags to effectively describe the data generation process. Within the ARDL model framework, the ARDL F-statistic is used to examine the existence of cointegration between the variables (Raihan & Tuspekova, 2022d, 2022e). This is achieved by employing an optimal number of lags, ensuring a comprehensive analysis. The examination used the Akaike information criterion (AIC) to determine the appropriate lag length for the F-statistic. The lag length was chosen based on the lowest AIC scores. If the ARDL F-statistic estimate exceeds a predefined upper critical limit, this proves that the factors under consideration are cointegrated. If the F-statistic is below the minimum critical threshold, this implies the absence of cointegration between the factors. When the F-statistic lies between the upper and lower critical levels, the experimental conclusions lack clarity (Raihan, 2023e, 2023f). The following equation (4) presents an estimation framework for ARDL bounds analysis used in the cointegration test.

$$\Delta LGDP = \gamma_0 + \gamma_1 LGDP_{t-1} + \gamma_2 LK_{t-1} + \gamma_3 LFD_{t-1} + \gamma_4 LGI_{t-1} + \gamma_5 LGOV_{t-1} + \gamma_6 LINF_{t-1} \sum_{i=1}^m \tau_1 \Delta LGDP_{t-i} + \sum_{i=0}^m \tau_2 \Delta LK_{t-1} + \sum_{i=0}^m \tau_3 \Delta LFD_{t-1} + \sum_{i=0}^m \tau_4 \Delta LGI_{t-1} + \sum_{i=0}^m \tau_5 \Delta LGOV_{t-1} + \sum_{i=0}^m \tau_6 INFK_{t-1} + \varepsilon_t \quad (4)$$

Where Δ represents the first difference operator, γ_0 is a constant, and m is the optimal delay length that will be selected based on information criterion tests for delay selection. $\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5$ and γ_6 are the long-term coefficients. $\tau_1, \tau_2, \tau_3, \tau_4, \tau_5$ and τ_6 represent the short-term coefficients. ε_t is the error term.

The long-term impacts of the factors were anticipated by solving Equation (4). However, the ARDL approach can be improved to derive the error correction model (ECM). This methodology produces reliable experimental results even with small sample sizes (Voumik et al., 2023c). To maintain a global perspective over an extended period, the ECM effectively incorporates immediate complexities with lasting stability (Raihan, 2023g, 2023h). The empirical model is capable of identifying and isolating numerous cointegration vectors due to their presence. The icon θ represents the ECM coefficient. The value of the ECM coefficient is generally between 0 and 1. In cases where the ECM gives significant negative results, it is imperative to correct the variance in order to achieve equilibrium. The short-term coefficients of the variables were derived using Equation (4) in this study.

$$\Delta LGDP = \gamma_0 + \gamma_1 LGDP_{t-1} + \gamma_2 LK_{t-1} + \gamma_3 LFD_{t-1} + \gamma_4 LGI_{t-1} + \gamma_5 LGOV_{t-1} + \gamma_6 LINF_{t-1} \sum_{i=1}^m \tau_1 \Delta LGDP_{t-i} + \sum_{i=0}^m \tau_2 \Delta LK_{t-1} + \sum_{i=0}^m \tau_3 \Delta LFD_{t-1} + \sum_{i=0}^m \tau_4 \Delta LGI_{t-1} + \sum_{i=0}^m \tau_5 \Delta LGOV_{t-1} + \sum_{i=0}^m \tau_6 INFK_{t-1} + \theta ECM_{t-1} + \varepsilon_t \quad (5)$$

The ARDL method is applied to estimate the long-term elasticities of financial development and globalisation on GDP growth. In addition, FMOLS and CCR estimators are used to assess the robustness of the estimated long-term elasticities. Furthermore, cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests are used in this study to verify the stability of long-term and short-term estimates.

4. Results and interpretation

Table 2. Descriptive statistics

	LGDP	LK	LGI	LFD	LGOV	LINF
Mean	8.2465609	3.46221010	3.72950845	3.06210233	2.79575961	1.82568105
Median	8.23075323	3.47941634	3.76762053	3.08467612	2.80531241	1.78627176
Maximum	8.46983559	3.88331566	3.89355541	4.23861589	3.02161762	3.45535918
Minimum	7.80382382	3.02903371	3.48864434	1.36287650	2.46640979	-1.0812739
Std. Dev.	0.14925557	0.19698991	0.12157464	0.88939739	0.1385454	0.85338131
Skewness	-0.4179187	0.04883182	-0.372183	-0.2079400	-0.4677746	-0.4788007
Kurtosis	2.90058407	2.15530127	1.88116952	1.74593525	2.74366066	4.30782529
Jarque-Bera	1.56462167	1.59674454	3.98795052	3.85494321	2.07795834	5.8021921
Probability	0.45734793	0.4500609	0.1361531	0.14551565	0.35381568	0.05496294
Sum	437.067732	183.497135	197.663948	162.291423	148.17525	96.7610960
Sum Sq. Dev.	1.15841579	2.01786128	0.76858049	41.1334414	0.99813208	37.8695027
Observations	53	53	53	53	53	53

Sources: Calculated by the authors using Eviews 13

Table 3. Correlation matrix

	LGDP	LK	LGI	LFD	LGOV	LINF
LGDP	1	0.30458878	0.64475110	-0.054515	0.19372032	-0.2474626
LK	0.3045887	1	0.02972458	0.51172184	0.30713986	0.14517280
LGI	0.64475110	0.02972458	1	-0.593874	-0.089546	-0.3555618
LFD	-0.0545154	0.51172184	-0.5938743	1	0.0602369	0.20372719
LGOV	0.19372032	0.30713986	-0.0895468	0.06023691	1	0.11886957
LINF	-0.2474626	0.14517280	-0.3555618	0.20372719	0.11886957	1

Sources: Calculated by the authors using Eviews 13

Descriptive statistics are presented in Table 02, showing the skewness, kurtosis, central tendency, and variability of each variable. In addition, the correlation matrix at

the bottom of the table helps to understand the relationships between pairs of variables, which can be essential for identifying patterns and interdependencies in the data.

This shows that LGDP has a high mean among the series, with a value of 8.2465609, a skewness of -0.4179187, indicating a slight negative skewness, and a kurtosis of 2.90058, indicating moderate kurtosis and suggesting that the distribution has thicker tails. The globalisation index, physical capital and financial development also have a high average after LGDP. All the variables in the sample are slightly negatively skewed, while LK has a positive skewness, estimated at 0.04883182. The Jarque-Bera test reveals that all variables follow a normal distribution.

According to the lower part of Table 03, LGDP and LGI show a strong positive correlation with a value of 0.6447, suggesting a potential marked trend in the same direction between economic growth and LGI, and reflecting the effective contribution of globalisation to stimulating economic growth. Furthermore, LK and LGOV are also positively correlated with economic growth, with positive values of 0.3045 and 0.19372, respectively. Capital accumulation promotes investment and increased production of goods and services, which can improve the overall standard of living of the population and support economic expansion. Public spending can promote economic growth. On the other hand, LFD and LINF show a weak negative correlation with LGDP, suggesting that financial development and inflation have a negative effect on economic growth.

Table 4. Augmented Dickey-Fuller, Phillips and Perron

Augmented Dickey-Fuller					Phillips-Perro			
Variable	Level		First difference		level		First difference	
	Constant	Constant & Trend	Constant	Constant & Trend	Constant	Constant & Trend	Constant	Constant & Trend
LGDP	(0.0189) -3.3205	(0.1577) -2.9441	(0.00)*** -9.5778	(0.004) *** -9.9299	(0.4549) -1.6410	(0.5780) -2.0182	(0.000)*** -8.9685	(0.00)*** -9.1368
LK	(0.3323) -1.8946	(0.6534) -1.8748	(0.00)*** -5.7894	(0.000) *** -5.7335	(0.2997) -1.9681	(0.6535) -1.8748	(0.000)*** -6.8052	(0.000)*** -6.7342
LGI	(0.3257) -1.909	(0.2128) -2.7748	(0.000)*** -9.337	(0.000)*** -9.2833	(0.3740) -1.8052	(0.2375) -2.7087	(0.000) -9.6332	(0.000)*** -9.6565
LFD	(0.6655) -1.2058	(0.8726) -1.3179	(0.00) *** -6.041	(0.000)*** -5.9902	(0.5311) -1.4896	(0.7410) -1.6918	(0.000) -6.0812	(0.000)*** -6.0257
LGOV	(0.054)* -2.8838	(0.080)* -3.2824	(0.000)*** -5.412	(0.000) *** -5.382	(0.098) -2.6064	(0.2124) -2.7758	(0.000) -6.9270	(0.000)*** -6.8836
LINF	(0.027) -3.1655	(0.078) -3.2947			(0.0262) -3.1883	(0.0742) -3.3192		

Sources: Calculated by the authors using Eviews 13

(***), (**), (*): Stationarity of variables at significance levels of 1%, 5%, and 10%.

The values in brackets are probabilities.

Before undertaking the cointegration analysis, the stationarity of the series was assessed using the Augmented Dickey-Fuller and Phillips-Perro tests, as shown in Table 4. Public expenditure and inflation were found to be stationary at the level according to the ADF test, but all series become stationary in the first order. Consequently, the underlying variables are a mixture of order I (0) and I (1). This allows us to perform an estimation using the ARDL method.

Table 5. Number of delays P:

Lag	LogL	LR	FPE	AIC	SC	HQ
0	46.947376	NA	7.57e-09	-1.671321	-1.439670	-1.583433
1	280.22718	399.9082	2.44e-12	-9.723558	-8.10199*	-9.10834*
2	308.99992	42.27832	3.50e-12	-9.428568	-6.417099	-8.286021
3	351.62864	52.19843	3.19e-12	-9.699128	-5.297751	-8.029252
4	425.67643	72.5366*	9.85e-13*	-11.2521*	-5.460813	-9.054893

Sources: Calculated by the authors using Eviews 13

Based on the information criteria presented in Table 5, the appropriate lag length for the model was selected. Model 4 was evaluated, and a lag of 4 periods was chosen according to the Akaike information criterion (AIC). This implies that a lag of 4 is optimal for capturing the persistent dynamics between financial development, globalisation and economic growth. Using this lag structure, the ARDL model can be correctly specified to estimate long-run and short-run relationships.

- ARDL Long Run Form and Bounds Test:

$$\begin{cases} H_0: \text{Absence of a cointegration relationship} \\ H_1: \text{Cointegration relationship} \end{cases}$$

Table 6. F-Bounds Test

Test statistic	Estimate	Significance	I (0)	I (1)
F-statistic	6.56296	10 %	2.08	3
K	5	5 %	2.39	3.38
		1%	3.06	4.15

Sources: Calculated by the authors using Eviews 13

Cointegration techniques using the bounds test are used in this study to identify and analyse long-term correlations between variables. This test also contributes to the development of a more robust model by highlighting dynamic interactions. The results are presented in Table 6. The test reveals that all the variables analysed are cointegrated in a long-term equilibrium relationship over the period studied, at a significance level of 1%, as indicated by the high value of the F statistic.

Table 7. Long-term regression and error correction coefficients of the ARDL model

Long terme				
Variable	Coefficient	Std. Error	t-Statistic	Prob
LK (-1)	-0.31198	0.063582	-4.906767	0.0000
LFD (-1)	0.13177	0.015461	8.522697	0.0000
LGI (-1)	1.38175	0.099475	13.89043	0.0000
LGOV (-1)	0.15699	0.065016	2.41472	0.0000
LINF	-0.00385	0.009771	-0.394213	0.6953
C	3.37822	0.361321	9.349762	0.0000
Court terme				
Variable	Coefficient	Std. Error	t-Statistic	Prob
ECM (-1) *	-0.47289	0.06309	-7.493319	0.0000
D (LGDP (-1))	0.16038	0.10418	1.539322	0.1332
D (LGDP (-2))	-0.14714	0.06456	-2.278939	0.0292
D(LK)	-0.04941	0.03292	-1.500791	0.1429
D (LK (-1))	0.14951	0.032012	4.670436	0.0000
D (LK (-2))	-0.0153	0.024758	-0.619583	0.5397
D (LK (-3))	0.12435	0.025750	4.829266	0.0000
D(LFD)	0.02642	0.009673	2.732259	0.0100
D (LFD (-1))	0.01222	0.007721	1.58302	0.1230
D (LFD (-2))	0.02162	0.008065	2.68180	0.0113
D(LGI)	-0.08635	0.050154	-1.72167	0.0944
D (LGI (-1))	-0.60202	0.09585	-6.28040	0.0000
D (LGI (-2))	-0.46503	0.077061	-6.03454	0.0000
D (LGI (-3))	-0.18420	0.062237	-2.95967	0.0056
D(LGOV)	-0.00078	0.037896	-0.02055	0.9837
D (LGOV (-1))	-0.0926	0.03863	-2.3992	0.0222

Sources: Calculated by the authors using Eviews 13

In this section, the estimated coefficients will be interpreted and discussed based on the ARDL model results reported in Table 7.

As shown in Table 8, globalisation has positive and beneficial effects on long-term economic growth in Algeria, implying that a 1% increase in Algeria's globalisation index will lead to a 1.38175% increase in economic growth over time. This result suggests that globalisation has been beneficial for the Algerian economy. This conclusion is supported by Hordofa (2024) and Kandil et al. (2017) in the case of India, but contradicts the results for China. Globalisation is one of the most important factors in accelerating institutional transformation in developing countries in order to promote financial development and economic progress (Mishkin, 2009).

The capital coefficient indicates a negative influence on long-term economic growth in Algeria, meaning that a 1% decline in capital would lead to a 0.31198% decline in economic growth. These results, supported by Baidoo et al. (2023), contradict those of Kandil et al. (2017) and Hordofa (2024), who argue that capital stimulates growth. The potential impediment to Algeria's economic growth linked to physical

capital could be explained by insufficient capital accumulation. Indeed, capital accumulation is supposed to promote investment, increase the production of goods and services, improve the standard of living of the population and stimulate economic expansion. However, in Algeria, this process still seems limited, which slows down the expected positive effects on growth.

Many economists have highlighted the benefits of financial globalisation for economic growth and encouraged developing countries to consider opening their capital markets to external capital flows (Bhanumurthy & Kumawat, 2020). Financial development has a positive influence on long-term economic growth in Algeria, implying that a 1% increase in financial sector indicators will improve economic growth by 0.13177%. This result confirms that of Kandil et al. (2017). Financial development plays a key role in stimulating economic growth. An efficient financial system facilitates the mobilisation of savings, the efficient allocation of resources, risk diversification and the promotion of productive investment. By ensuring better access to credit and strengthening the efficiency of financial markets, it supports entrepreneurship, innovation and job creation.

Economic theory stipulates that a functional financial system facilitates the development of the financial sector. Financial resources are distributed to industrial sectors through a financial system structured in a way that promotes economic efficiency, physical capital accumulation and growth (Abbas et al., 2022). A well-established and advanced financial system enhances the competence and efficiency of financial institutions and promotes innovation in the provision of financial services. In addition, it contributes to technological development, reduces information costs and improves the profitability of investments (Shahbaz & Lean, 2012).

Public expenditure, as a control variable, was found to have a positive influence on economic growth, suggesting that a 1% increase in public expenditure will result in 0.15699% economic growth in Sudan. This finding is consistent with the results of Baidoo et al. (2023). This result supports favourable long-term changes in Algeria's fiscal policy to support productive sectors and encourage domestic production. Financial sector activities are strongly supported by public expenditure directed towards capital investment (Aboagye & Kwakwa, 2023).

The results of this study highlight the deep relationship between globalisation and economic expansion, and highlight the different ways in which globalisation contributes to economic growth, including through technology transfer, financial flows, access to international markets and the spread of entrepreneurship.

Furthermore, it is reasonable to consider that the inefficiency of financial markets in most developing countries increases the likelihood of economic crises by causing excessive volatility in capital investment and trade. This situation makes Algerian financial institutions particularly fragile and vulnerable to external shocks.

Therefore, to support Algeria's economic development, it would be appropriate to promote greater openness to global markets, facilitate access to international markets, and establish a sound and sophisticated financial system. Optimal use of capital, accompanied by improved public spending policy geared towards productive sectors and the promotion of domestic production, could significantly stimulate economic growth.

Algeria could also benefit from increased cooperation at the global and regional levels by strengthening trade flows, establishing strategic alliances, modernising its infrastructure, and exploiting the opportunities offered by globalisation. In this context, human capital formation and the efficient use of available resources will play a key role in optimising long-term benefits.

This also involves implementing complementary measures such as appropriate regulations, incentive laws on investment, improving institutional quality, better integration of the banking system, and strategic prioritisation of public spending. In the short-term section of Table 8, the ECT coefficient (-1) is negative, indicating that changes occurring in the short term will be adjusted towards long-term equilibrium at a rate of 0.47289% per annum.

Globalisation, capital and financial development have shown a variety of effects on short-term economic growth, both positive and negative. However, economic growth is negatively affected by public spending in a statistically significant way in the short term. This result contrasts with the long-term impact and may be due to low responsiveness to short-term policy adjustments.

Through specialisation and economies of scale, globalisation can lead to improved market access and efficiency gains, which can promote productivity gains and economic expansion. Conversely, globalisation can also lead to increased competition and job losses in certain sectors, which could temporarily slow economic growth. Furthermore, in the short term, financial development, which includes strengthening markets, institutions and financial instruments, has both positive and negative consequences for economic growth. Capital allocation and investment facilitated by an efficient financial system can increase productivity and economic growth. However, overly liberalised or unstable financial systems can cause financial crises and turbulence that have a negative effect on economic growth.

Table 8. Tests of the robustness of long-term FMOLS and CCR elasticities

Variable	FMOLS			CCR		
	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
LK	-0.3048	-2.85984	0.0064	-0.3323	-3.0252	0.0041
LFD	0.1453	5.26232	0.0000	0.1460	5.2801	0.0000
LGI	1.6401	8.74804	0.0000	1.6172	9.0012	0.0000
LGOV	0.3027	2.7470	0.0086	0.3302	3.0802	0.0035
LINF	0.0144	0.8022	0.4628	0.0184	0.8633	0.3924

C	1.8780	2.6051	0.0123	1.9734	2.7688	0.0081
R-squared	0.5543			0.5509		
Adjusted R-squared	0.5059			0.50219		

Sources: Calculated by the authors using Eviews 13

The results, based on the robustness of the FMOLS and CCR tests, show that globalisation has positive and beneficial effects on economic growth in Algeria, implying that a 1% increase in Algeria's globalisation index will lead to a long-term increase in economic growth of 1.6401% and 1.6172% respectively. Capital coefficients appear to slow economic growth in Algeria, with a respective decline of 0.075084% and 0.070782% if financial development increases by 1%. The financial development coefficients reveal a positive influence on economic growth in Algeria, suggesting that a 1% increase in financial development will lead to an improvement in economic growth of 0.1453% and 0.1460% respectively. These results are consistent with the ARDL model forecasts and validate the robustness of the estimates obtained by this method. Public expenditure shows a positive relationship with economic growth.

- Variable stability test:

The sum of errors lies between the two confidence thresholds on the two graphs below, which means that the value of the model parameters is constant over time. In other words, the variables are stationary.

Fig.2. Cumulative graph

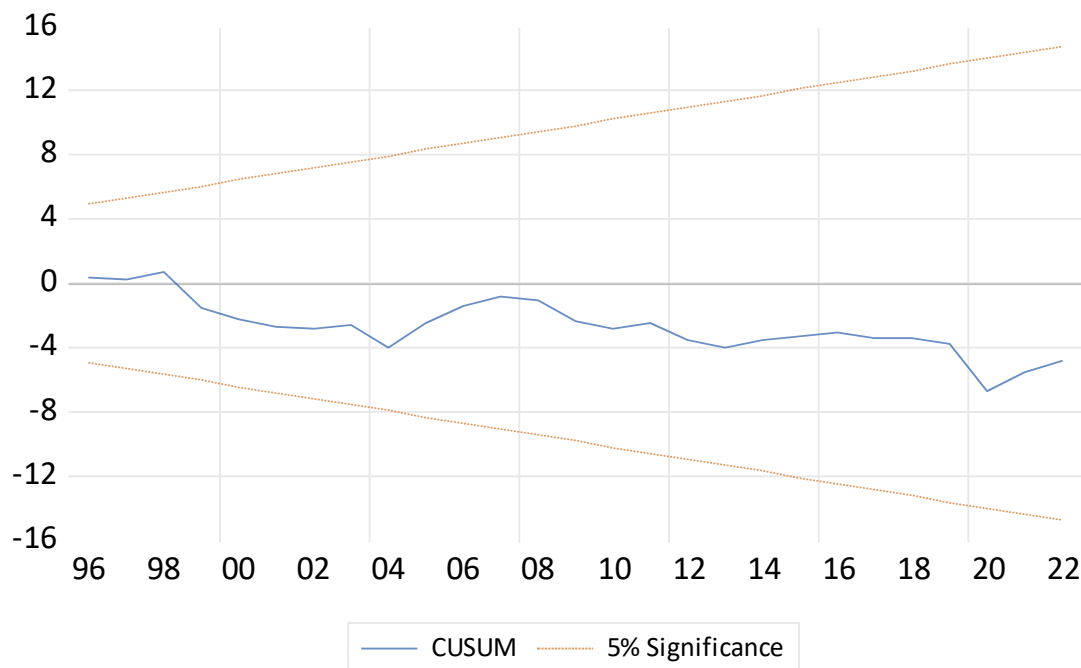
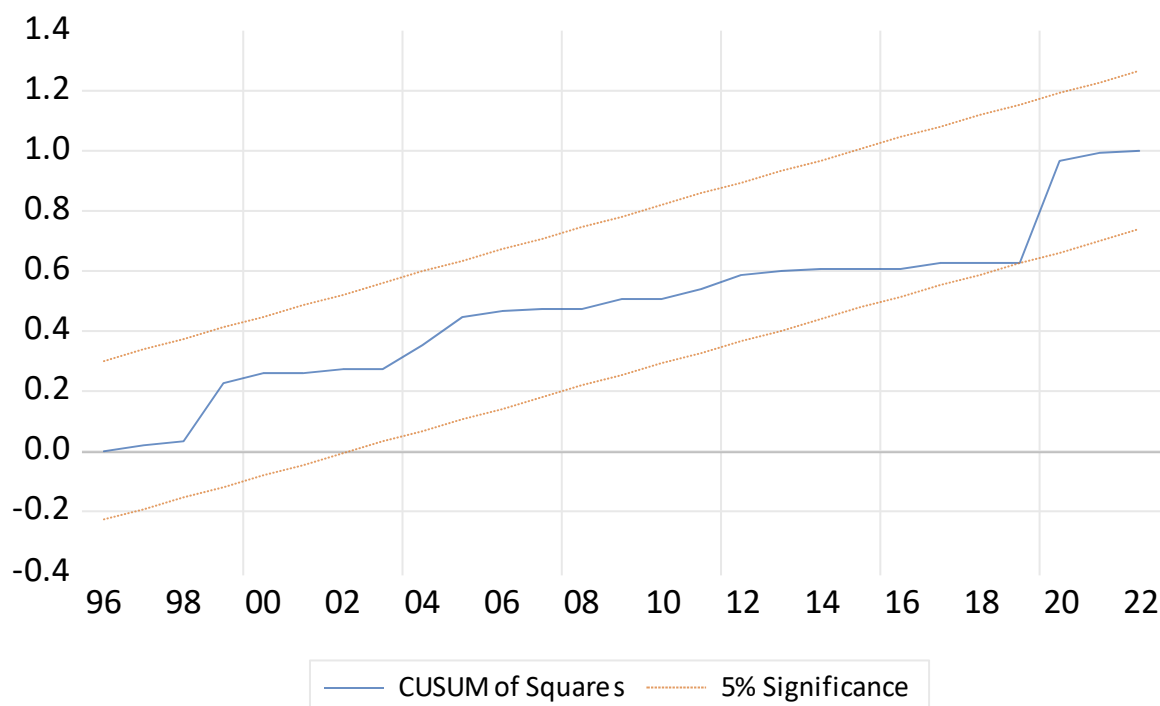


Fig.3. Cumulative sum of squares graph



In addition, the CUSUM and CUSUMSQ functions are used to assess the structural stability of the model in this study. The graphical interpretation of the CUSUM and CUSUMSQ examination can be seen in the figure.

The stability of the model parameters can be established by measuring how much the scatter plots deviate from the critical limit, with a maximum allowable deviation of

5%. The graphical representations indicate that the CUSUM and CUSUMSQ estimates remained within the acceptable limit of $\pm 5\%$ throughout the investigation.

Table 9. Diagnostic test

Test			F-statistic	Prob
Breusch-Pagan-Godfrey Heteroskedasticity			0.295244	0.997192
Breusch-Godfrey	Serial	Correlation	2.220466	0.148224
LM				
Ramsey RESET			2.43E – 05	0.996104

Sources: Calculated by the authors using Eviews 13

Heteroscedasticity, residual autocorrelation and Ramsey RESET tests were used to assess the relevance of the coefficients obtained. The results presented in the table indicate that the P-values of the F-statistics are, respectively, above the 1% threshold. This leads to the acceptance of the null hypothesis for each of the tests, namely: the residuals are homoscedastic, there is no serial correlation of the residuals, and the functional forms are correctly specified.

5. Conclusion

Globalisation and financial development have recently been recognised as key factors in real economic components. The main objective of this study is to assess how globalisation and financial development have contributed to economic growth in Algeria, using data from 1970 to 2023 and applying the autoregressive distributed lag (ARDL) model.

Understanding the theoretical and empirical implications of financial development and the economic contribution of globalisation to growth in Algeria is essential to explaining the dynamics of these factors in the economic development process. Thus, by analysing the effects of globalisation, financial development, public spending and inflation on economic growth in Algeria, this study aims to fill a gap in the existing literature.

The bounds cointegration method is used to identify long-term cointegration relationships between variables. The ARDL method is then used to estimate the long-term elasticities of financial development and globalisation on GDP growth. FMOLS and CCR estimators are also used to test the robustness of the estimated long-term elasticities. In addition, cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests are applied to verify the stability of short- and long-term estimates. The cointegration test results show that all the variables analysed are cointegrated. Globalisation has a positive and beneficial effect on Algeria's long-term economic growth, meaning that a 1% increase in Algeria's globalisation index would lead to a 1.38175% increase in economic growth over time. Financial development also has a positive influence on long-term economic growth: a 1% increase in financial development would improve economic growth by 0.13177%. On the other hand, the capital coefficient appears to be holding back growth in Algeria. Public expenditure, as

a control variable, has a positive effect on economic growth, suggesting that a 1% increase in public expenditure would lead to a 0.15699% increase in economic growth. In the short term, the error correction term (ECT, -1) coefficient is negative, showing that short-term imbalances are corrected at a rate of 0.47289% per annum to restore long-term equilibrium. Globalisation, capital and financial development have various effects on short-term economic growth, both favourable and unfavourable.

The robustness of the results obtained by the FMOLS and CCR tests is consistent with the ARDL model forecasts, confirming the reliability of the ARDL estimates for globalisation, financial development and public spending. On the other hand, capital shows a negative relationship with economic growth. The CUSUM and CUSUMSQ stability tests, as well as the diagnostics of heteroscedasticity, serial correlation and Ramsey's RESET test, confirm that the estimated coefficients are stable and reliable. The findings of this study have important economic policy implications for addressing the challenges of economic development in Algeria. Financial development plays a crucial role in Algeria's economic growth by facilitating access to credit, encouraging investment and supporting local businesses. By promoting financial inclusion, in particular, through the provision of banking services to the population and the modernisation of payment systems, the financial sector enables businesses to develop, innovate and create added value. In addition, access to appropriate financing helps SMEs overcome obstacles to profitability and competitiveness, thereby contributing to economic diversification, which is imperative for Algeria in the context of its energy and industrial transition. Strengthening the banking sector and promoting foreign investment to stimulate innovation also supports the creation of new economic sectors, generating sustainable growth. Thus, a strong and well-regulated financial system is an essential lever for stimulating economic growth and promoting Algeria's long-term development.

According to the results concerning globalisation, Algeria must continue to embrace globalisation and allow foreign investment and trade in its economy. Policies that support trade liberalisation, remove barriers to foreign investment and improve access to global markets can help achieve sustainable economic growth. In addition, Algeria's involvement in the process of greater integration into the global economy must be strengthened.

Given the limited impact of capital on Algeria's current economic performance, policymakers should focus on strengthening productive capital accumulation in order to stimulate the production of goods and services. This dynamic could contribute to job creation, improved living standards for the population and economic growth. Consequently, public policies must focus on attracting both foreign and domestic investment in order to boost the industrial fabric and support infrastructure development. This involves, in particular, reforming the regulatory framework to improve the business

climate, implementing investment incentives, and strengthening the infrastructure needed to accommodate capital flows.

6. Bibliography List

- Abbas, Z., Afshan, G., & Mustifa, G. (2022). The effect of financial development on economic growth and income distribution: An empirical evidence from lower-middle and upper-middle-income countries. *Development Studies Research*, 9(1), 117–128. <https://doi.org/10.1080/21665095.2022.2065325>
- Abeka, M. J., Andoh, E., Gatsi, J. G., & Kawor, S. (2021). Financial development and economic growth nexus in SSA economies: The moderating role of telecommunication development. *Cogent Economics and Finance*, 9(1), 1862395. <https://doi.org/10.1080/23322039.2020.1862395>
- Acheampong, A. O., Boateng, E., Amponsah, M., & Dzator, J. (2021). Revisiting the economic growth–energy consumption nexus: Does globalization matter? *Energy Economics*, 102, Article 105472. <https://doi.org/10.1016/j.eneco.2021.105472>
- Ahmed, E. M., & Elfaki, K. E. (2023). Green technological progress implications on long-run sustainable economic growth. *Journal of the Knowledge Economy*. <https://doi.org/10.1007/s13132-023-01268-y>
- Ali, S. A. S. (2013). Financial intermediation and economic growth in Sudan: An empirical investigation, 1970–2011. *British Journal of Economics, Management & Trade*, 3(4), 332–358. <https://doi.org/10.9734/BJEMT/2013/3387>
- Arabi, A. M. K. (2014). The effect of financial development on economic growth in Sudan: Evidence from VECM model. *International Journal of Economics and Finance*, 6(11), 72–82. <https://doi.org/10.5539/ijef.v6n11p72>
- Asante, G. N., Takyi, P. O., & Mensah, G. (2023). The impact of financial development on economic growth in sub-Saharan Africa: Does institutional quality matter? *Development Studies Research*, 10(1), 2156904. <https://doi.org/10.1080/21665095.2022.2156904>
- Asghar, N., & Hussain, Z. (2014). Financial development, trade openness, and economic growth in developing countries: Recent evidence from panel data. *Pakistan Economic and Social Review*, 52(2), 99–126. <https://www.jstor.org/stable/24398853>
- Baidoo, S. T., Tetteh, B., Boateng, E., & Ayibor, R. E. (2023). Estimating the impact of economic globalization on economic growth of Ghana: Wavelet coherence and ARDL analysis. *Research in Globalization*, 100183. <https://doi.org/10.1016/j.resglo.2023.100183>
- Barry, H. (2010). Globalization and economic growth in Sub-Saharan Africa. *Gettysburg Economic Review*, 4(1), 42–86. <https://cupola.gettysburg.edu/ger/vol4/iss1/4>

- Beck, T. (2002). Financial development and international trade: Is there a link? *Journal of International Economics*, 57(1), 107–131. [https://doi.org/10.1016/S0022-1996\(01\)00131-3](https://doi.org/10.1016/S0022-1996(01)00131-3)
- Bhanumurthy, N. R., & Kumawat, L. (2020). Financial globalization and economic growth in South Asia. *South Asia Economic Journal*, 21(1), 31–57. <https://doi.org/10.1177/1391561420909007>
- Bist, J. P. (2018). Financial development and economic growth: Evidence from a panel of 16 African and non-African low-income countries. *Cogent Economics & Finance*, 6(1), Article 1449780. <https://doi.org/10.1080/23322039.2018.1449780>
- Charfeddine, L., & Khedira, K. B. (2016). Financial development and environmental quality in UAE: Cointegration with structural breaks. *Renewable and Sustainable Energy Reviews*, 55, 1322–1335. <https://doi.org/10.1016/j.rser.2015.07.059>
- Dreher, A. (2006). Does globalization affect growth? Evidence from a new index of globalization. *Applied Economics*, 38(10), 1091–1110. <https://doi.org/10.1080/00036840500392078>
- Elfaki, K. E., Handoyo, R. D., & Ibrahim, K. H. (2021). The impact of industrialization, trade openness, financial development, and energy consumption on economic growth in Indonesia. *Economies*, 9(4), 174. <https://doi.org/10.3390/economies9040174>
- Fosah, M. S. G., Mama, N., Dinga, G. D., & Nchofoung, T. N. (2023). The effect of globalisation on Sub-Saharan Africa's development thrives. *Research in Globalization*, 7, Article 100149. <https://doi.org/10.1016/j.resglo.2023.100149>
- Fuinhas, J. A., Marques, A. C., & Lopes, C. (2019). The impact of financial development and globalisation on economic growth: Evidence from a macro panel of ten countries. *Asian Economic and Financial Review*, 9(3), 366–388. <https://doi.org/10.18488/journal.aefr.2019.93.366.388>
- Fung, M. K. (2009). Financial development and economic growth: Convergence or divergence? *Journal of International Money and Finance*, 28(1), 56–67. <https://doi.org/10.1016/j.jimonfin.2008.08.001>
- Goswami, N. (2013). Role of trade openness and financial development in economic growth: Panel evidence from South Asia. *International Journal of Trade and Global Markets*, 6(3), 301–322. <https://doi.org/10.1504/IJTGM.2013.054913>
- Grossman, G. M., & Helpman, E. (1991). Trade, knowledge spillovers, and growth. *European Economic Review*, 35(2–3), 517–526. [https://doi.org/10.1016/0014-2921\(91\)90153-A](https://doi.org/10.1016/0014-2921(91)90153-A)
- Gygli, S., Haelg, F., Potrafke, N., & Sturm, J. E. (2019). The KOF globalisation index—revisited. *The Review of International Organizations*, 14, 543–574. <https://doi.org/10.1007/s11558-019-09344-2>
- Hordofa, D. F. (2024). Disentangling the effects of globalization on growth: Evidence from Ethiopia using an ARDL approach. *Research in Globalization*, 8, Article 100224. <https://doi.org/10.1016/j.resglo.2024.100224>

- Hussein, M. A., Ahmed, S. A., & Ahmed, H. M. S. (2020). Impact of financial development on economic growth in Sudan: Short-run and long-run analysis. *International Journal of Management*, 11(12), 2919–2932. <https://doi.org/10.34218/IJM.11.12.2020.274>
- Kandil, M., Shahbaz, M., Mahalik, M. K., & Nguyen, D. K. (2017). The drivers of economic growth in China and India: Globalization or financial development? *International Journal of Development Issues*, 16(1), 54–84. <https://doi.org/10.1108/IJDI-06-2016-0036>
- Kazar, A., & Kazar, G. (2016). Globalization, financial development and economic growth. *International Journal of Economics and Financial Issues*, 6(2), 578–587.
- Khoshnevis Yazdi, S., & Shakouri, B. (2017). The globalization, financial development, renewable energy, and economic growth. *Energy Sources, Part B: Economics, Planning and Policy*, 12(8), 707–714. <https://doi.org/10.1080/15567249.2017.1292329>
- Kilic, C. (2015). Effects of globalization on economic growth: Panel data analysis for developing countries. *Economic Insights – Trends and Challenges*, IV(LXVII), 1–11.
- Lawal, A. I., Nwanji, T. I., Ashley, A., & Ahmed, V. (2016). Economic growth, financial development and trade openness in Nigeria: An application of the ARDL bound testing approach. *Cogent Economics & Finance*, 4(1), 1258810. <https://doi.org/10.1080/23322039.2016.1258810>
- Mahalik, M. K., Babu, M. S., Loganathan, N., & Shahbaz, M. (2017). Does financial development intensify energy consumption in Saudi Arabia? *Renewable and Sustainable Energy Reviews*, 75, 1022–1034. <https://doi.org/10.1016/j.rser.2016.11.081>.
- Mishkin, F. S. (2009). Globalization and financial development. *Journal of Development Economics*, 89(2), 164–169. <https://doi.org/10.1016/j.jdeveco.2007.11.004>
- Mohamad, S. E. (2008). Finance-growth nexus in Sudan: Empirical assessment based on an application of the Autoregressive Distributed Lag (ARDL) model. *Working Paper, No.API/WPS 0803*. Arab Planning Institute, Kuwait.
- Nasreen, S., Mahalik, M. K., Shahbaz, M., & Abbas, Q. (2020). How do financial globalization, institutions, and economic growth impact financial sector development in European countries? *Research in International Business and Finance*, 54, Article 101247. <https://doi.org/10.1016/j.ribaf.2020.101247>
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326. <https://doi.org/10.1002/Jae.616>
- Polat, A., Shahbaz, M., Rehman, I. U., & Satti, S. L. (2015). Revisiting linkages between financial development, trade openness and economic growth in South Africa: Fresh evidence from combined cointegration test. *Quality & Quantity*, 49(2), 785–803. <https://doi.org/10.1007/s11135-014-0023-x>

- Radmehr, R., Ali, E. B., Shayanmehr, S., Saghaian, S., Darbandi, E., Agbozo, E., & Sarkodie, S. A. (2022). Assessing the global drivers of sustained economic development: The role of trade openness, financial development, and FDI. *Sustainability*, 14(21), 14023. <https://doi.org/10.3390/su142114023>
- Raihan, A. (2023e). The dynamic nexus between economic growth, renewable energy use, urbanization, industrialization, tourism, agricultural productivity, forest area, and carbon dioxide emissions in the Philippines. *Energy Nexus*, 9, 100180. <https://doi.org/10.1016/j.nexus.2023.100180>
- Raihan, A. (2023f). An econometric evaluation of the effects of economic growth, energy use, and agricultural value added on carbon dioxide emissions in Vietnam. *Asia-Pacific Journal of Regional Science*, 7, 665–696. <https://doi.org/10.1007/s41685-023-00278-7>
- Raihan, A. (2023g). Economy-energy-environment nexus: The role of information and communication technology towards green development in Malaysia. *Innovation and Green Development*, 2, 100085. <https://doi.org/10.1016/j.igd.2023.100085>
- Raihan, A. (2023h). Nexus between greenhouse gas emissions and its determinants: The role of renewable energy and technological innovations towards green development in South Korea. *Innovation and Green Development*, 2, 100066. <https://doi.org/10.1016/j.igd.2023.100066>
- Raihan, A., & Tuspekova, A. (2022b). Dynamic impacts of economic growth, renewable energy use, urbanization, industrialization, tourism, agriculture, and forests on carbon emissions in Turkey. *Carbon Research*, 1(1), 20. <https://doi.org/10.1007/s44246-022-00019-z>
- Raihan, A., & Tuspekova, A. (2022e). Dynamic impacts of economic growth, energy use, urbanization, agricultural productivity, and forested area on carbon emissions: New insights from Kazakhstan. *World Development Sustainability*, 1, 100019. <https://doi.org/10.1016/j.wds.2022.100019>
- Raihan, A., Muhtasim, D. A., Farhana, S., Rahman, M., Hasan, M. A. U., Paul, A., & Faruk, O. (2023d). Dynamic linkages between environmental factors and carbon emissions in Thailand. *Environmental Processes*, 10, 5. <https://doi.org/10.1007/s40710-023-00618-x>
- Rahman, M. M., Shahbaz, M., & Farooq, A. (2015). Financial development, international trade, and economic growth in Australia: New evidence from multivariate framework analysis. *Journal of Asia-Pacific Business*, 16(1), 21–43. <https://doi.org/10.1080/10599231.2015.997625>
- Rani, R., & Kumar, N. (2018). Panel data analysis of financial development, trade openness, and economic growth: Evidence from BRICS countries. *Emerging Economy Studies*, 4(1), 1–18. <https://doi.org/10.1177/2394901518767023>

- Romer, P. (1994). New goods, old theory, and the welfare costs of trade restrictions. *Journal of Development Economics*, 43(1), 5–38. [https://doi.org/10.1016/0304-3878\(94\)90021-3](https://doi.org/10.1016/0304-3878(94)90021-3)
- Sahoo, M., & Sethi, N. (2023). An empirical insight into the financial globalization–growth nexus via trade openness: Evidence from select South Asian countries. *Global Business Review*, 24(2), 317–334. <https://doi.org/10.1177/0972150919893840>
- Samimi, P., & Jenatabadi, H. S. (2014). Globalization and economic growth: Empirical evidence on the role of complementarities. *PLoS One*, 9(4), e87824.
- Savrul, M., & Incekara, A. (2017). The effect of globalization on economic growth: Panel data analysis for ASEAN countries. *International Conference on Eurasian Economies*, 16–22. <https://doi.org/10.36880/C08.01870>
- Schumpeter, J. (1911). *The theory of economic development*. Cambridge, MA: Harvard University Press.
- Sethi, P., Chakrabarti, D., & Bhattacharjee, S. (2020). Globalization, financial development and economic growth: Perils on the environmental sustainability of an emerging economy. *Journal of Policy Modeling*, 42(3), 520–535. <https://doi.org/10.1016/j.jpolmod.2020.01.007>
- Sghaier, I. M. (2021). Trade openness, financial development and economic growth in North African countries. *International Journal of Finance & Economics*, 1–12. <https://doi.org/10.1002/ijfe.2503>
- Shaheen, S., Awan, M. S., Waqas, M., & Aslam, M. A. (2011). Financial development, international trade and economic growth: Empirical evidence from Pakistan. *Romanian Journal of Fiscal Policy*, 2(2), 11–19. <http://hdl.handle.net/10419/59805>
- Shahbaz, M. (2012). Does trade openness affect long-run growth? Cointegration, causality and forecast error variance decomposition tests for Pakistan. *Economic Modelling*, 29(6), 2325–2339. <https://doi.org/10.1016/j.econmod.2012.07.015>
- Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70(1), 65–94. <https://doi.org/10.2307/1884513>
- Takefman, B. (2023). The effects of globalization on economic development. *FDI Insights*. <https://researchfdi.com/resources/articles/the-effects-of-globalization-on-economic-development/>
- Voumik, L. C., Rahman, M. H., Rahman, M. M., Ridwan, M., Akter, S., & Raihan, A. (2023b). Toward a sustainable future: Examining the interconnectedness among Foreign Direct Investment (FDI), urbanization, trade openness, economic growth, and energy usage in Australia. *Regional Sustainability*, 4, 405–415. <https://doi.org/10.1016/j.regsus.2023.11.003>
- Voumik, L. C., Ridwan, M., Rahman, M. H., & Raihan, A. (2023c). An investigation into the primary causes of carbon dioxide releases in Kenya: Does renewable energy matter to reduce carbon emission? *Renewable Energy Focus*, 47, 100