



## ECONOMIC GROWTH DETERMINANTS IN MOROCCO: SHORT AND LONG-TERM ANALYSIS ON THE IMPACT OF FOREIGN AND DOMESTIC DIRECT INVESTMENT AND EXPORTS<sup>i</sup>

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### **Abstract:**

The purpose of this study is to explore the short and long-term impact of foreign and domestic investment and exports on economic growth in Morocco from 1990 to 2023. By integrating a comprehensive literature review with econometric modeling, this research utilizes Time Series Analysis and the Vector Error Correction Model (VECM) approach, implemented via the R programming language, to examine the effects of foreign direct investment (FDI), domestic investment (DI), and exports (EX) on economic growth, as measured by real GDP per capita. The main findings of the study demonstrate the significant roles played by all three factors - FDI, DI, and EX - in driving Morocco's short- and long-term economic growth, contributing to stability and resilience against economic shocks. These findings underscore the substantial contributions of FDI, DI, and EX to Morocco's economic expansion and global competitiveness. The analysis concludes an optimistic forecast for Morocco's economic future, projecting significant GDP per capita growth driven by continued expansion in investments and exports. This study offers valuable insights for policymakers and investors, enriches the understanding of the economic dynamics in Morocco, and facilitates strategic decision-making for sustainable economic development.

**JEL:** F21, F43, O11, O19, C32

**Keywords:** macroeconomic analysis, economic growth, foreign direct investment, exports, VAR, VECM, cointegration, Morocco

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<sup>i</sup> DÉTERMINANTS DE LA CROISSANCE ÉCONOMIQUE AU MAROC : ANALYSE A COURT ET LONG TERME DE L'IMPACT DE L'INVESTISSEMENT DIRECT ET DES EXPORTATIONS

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## Résumé:

Dans un contexte économique mondial en constante évolution, les pays cherchent à comprendre et à optimiser leurs stratégies de développement afin de rester compétitifs sur la scène internationale. En tant qu'acteur émergent, le Maroc ne fait pas exception à cette dynamique. L'objectif de cette étude est d'explorer le développement économique du Maroc de 1990 à 2023. En intégrant une revue exhaustive de la littérature et une modélisation économétrique, cette recherche utilise l'analyse des séries temporelles et l'approche du modèle de correction des erreurs vectorielles (VECM), mise en œuvre via le langage de programmation R, pour examiner les effets de l'investissement direct étranger (IDE), de l'investissement domestique (ID) et des exportations (EX) sur la croissance économique, telle que mesurée par le PIB réel par habitant. Les résultats démontrent les rôles significatifs joués par les trois facteurs - IDE, ID et EX - dans la croissance économique à court et à long terme du Maroc, contribuant à la stabilité et à la résilience face aux chocs économiques. Ces résultats soulignent les contributions substantielles de l'IDE, de l'ID et de l'EX à l'expansion économique et à la compétitivité mondiale du Maroc. L'analyse conclut à des prévisions optimistes pour l'avenir économique du Maroc, en projetant une croissance significative du PIB par habitant tirée par une expansion continue des investissements et des exportations. Cette étude offre des informations précieuses aux décideurs politiques et aux investisseurs, enrichit la compréhension de la dynamique économique au Maroc et facilite la prise de décisions stratégiques pour un développement économique durable.

**Mots clés:** analyse macroéconomique, croissance économique, investissement direct étranger, exportations, VAR, VECM, cointégration, Maroc

## 1. Introduction

In terms of economic globalization, developing countries face great challenges, but they also have great opportunities to foster growth and improve the living standards of their people. At the heart of this dynamic are three fundamental drivers of economic development: foreign direct investment (FDI), domestic investment and exports. These factors are crucial not only for strengthening national economic capacity but also for effective integration into the global economic system. Their synergistic role and interdependence form the basis for sustainable and inclusive economic development.

FDI brings various benefits, such as the potential for technology transfer, improved management skills, access to new markets and the possibility of increased employment (Al Samman & Akkaş, 2022; Iddrisu *et al.*, 2023; Sauvant, 2021). At the same time, domestic investment, including allocations to infrastructure, education and health, is essential to build a solid base for sustaining economic growth and innovation (Batool & Akbar, 2023; Swe, 2019). On the other hand, exports, by bringing local companies to international markets, improve competitiveness, promote quality standards and thus contribute to better integration into the global economy (Sunde *et al.*, 2023).

Morocco is a relevant example of this dynamic. To diversify its economy, the country has implemented a series of economic reforms designed to attract FDI, promote domestic investment and increase exports. These initiatives reflect the clear objective of transforming the country's economic model to make it more resilient, diversified and internationally oriented (Moussir & Tabit, 2016).

In this new global configuration, Morocco has real opportunities trying to seize. Opting for the gradual opening of its economy, Morocco is expanding through the multilateral framework of the WTO and Free Trade Agreements concluded, notably, with key players in the global economy (European Union, United States) and emerging or developing countries with high potential (Turkey, United Arab Emirates, countries of the Agadir Declaration ...) as well as numerous trade agreements with other countries, particularly African ones such as the African Continental Free Trade Area (AfCFTA) (International Trade Administration, 2024; World Bank, 2023).

Morocco has strategically positioned itself as an industrial powerhouse, focusing on sectors like automotive, aerospace, and electronics to drive economic growth and international competitiveness. The country's automotive industry, with a production capacity of 700,000 cars and an integration rate of 60%, has become one of the most competitive hubs globally, attracting major players like Renault and Stellantis (Auktor, 2022). Additionally, Morocco's aerospace sector, with 140 companies employing 20,000 people, has seen significant growth, with exports reaching \$2bn and partnerships with industry giants like Airbus and Boeing. Furthermore, the country's commitment to green energy and electronics sectors, as highlighted by its engagement in solar and wind energy production and advancements in electronics manufacturing services, showcases its dedication to sustainability and innovation (Financial Times, 2023; Forbes Africa, 2024). These structural transformations and sectoral policies have not only enhanced Morocco's global standing but also positioned it as a key player in the international market, attracting foreign investment as well as stimulating domestic investment and facilitating exportation to capitalize on global trade opportunities

Analyzing the impact of these three factors on Morocco's economic growth offers a unique perspective on the challenges and opportunities facing developing countries in the current context of globalization. This article aims to study the short- and long-term effects of FDI, domestic investment and exports on Morocco's economic growth. Through a detailed study of these three vectors of development, we seek to understand how they interact and what cumulative impact they have on the Moroccan economy. We rely on econometric analysis, in particular the use of the Vector Error Correction Model, to accurately assess their contribution to growth and identify the optimal path for sustainable and inclusive economic development in Morocco.

## 2. Literature review

### 2.1 FDI attraction

Over the years, Morocco has focused on improving its business environment to encourage foreign investors. The Moroccan government has implemented a series of economic reforms aimed at attracting foreign direct investment (FDI), these reforms have had a significant impact on the country's attractiveness to FDI. Some key reforms include:

- **Market integration and diversification policy:** Morocco has pursued a policy of integration into the global economy, particularly towards progressive markets, with a focus on Africa. This has led to significant growth in trade with the continent, demonstrating the country's commitment to economic diversification (Belhaj, 2019; Chebh Ismail & Noureddine Abdellatif, 2022).
- **Improvements in the business environment:** The country's efforts to improve its business environment have been recognized worldwide. Morocco has risen in rankings such as the World Bank's Doing Business report and the World Economic Forum's Global Competitiveness report, highlighting its improved business climate. (Belhaj, 2019; Bourhriba & Mandri, 2022).
- **Sectoral concentration and incentives:** Morocco has attracted significant FDI projects in sectors such as renewable energy, electric vehicles, chemicals and tourism. Government policies and incentives have played a crucial role in diversifying the economy and attracting investment in strategic sectors (Harbal & Khihel, 2023; Jean, 2023).
- **Investment charter:** The Investment Charter has been an important lever in strengthening Morocco's competitiveness in attracting FDI. The Charter has played a decisive role in stimulating investment in key sectors such as renewable energies, electric vehicles and semi-conductors, leading to a significant increase in FDI flows (Machloukh, 2024).
- **Skills development reforms:** Responding to the need for a skilled workforce, Morocco has been working to improve the qualifications of its workforce. Efforts to improve education and training programmes are aimed at meeting the demands of changing economic sectors and attracting more investment (Belhaj, 2019).
- **Legal reforms:** Morocco's recent legal reforms have made the country even more attractive to foreign investors. These reforms have focused on improving the business climate and creating a more favorable environment for investment in various sectors (Joachim, 2021).

These reforms collectively demonstrate Morocco's commitment to creating an environment conducive to foreign direct investment, leading to increased investor confidence and significant capital inflows into the country.

## 2.2 Promoting national investment and exports

Morocco has implemented a series of reforms aimed at promoting domestic investment and exports. These reforms include the creation of trade policy measures focused on export promotion and the attractiveness of foreign direct investment. In addition, Morocco has undertaken a vast programme of structural reforms to create a business-friendly climate, notably by strengthening and modernizing the legal framework, codifying company law, overhauling the labor and insurance codes, and publishing laws relating to foreign trade, offshore financial centers and export processing zones (Ministère des Finances, 2020).

Morocco has been implementing economic reforms through structural adjustment programmes since the 1980s and has accelerated them since 1999, leading to changes in economic policies. These reforms aim to promote economic growth, increase economic openness, strengthen the role of the private sector and improve social problems (Achahchah & Allah, 2023; Cherkaoui, 2019; OCED, 2011).

Morocco's economic reforms have been divided into four elements:

- 1) the creation of a sustainable medium-term macroeconomic framework,
- 2) public sector reform,
- 3) private sector development, and
- 4) poverty reduction and the promotion of human development resources according to the Economic and Social Reform Programme (ESRP) (Banque Africaine de Développement, 2022).

Thanks to these measures, Morocco could reach 70th place in the international ranking within 10 years, particularly in terms of competition and modernization of the legal and regulatory framework for business.

The results of Morocco's economic reforms are reflected in economic growth and in the resilience of the economy to global crises and climate change. The reforms have also enabled Morocco to benefit from successful sectoral and structural reform initiatives and strengthen its resilience and capacity for prosperity. All these economic reforms are currently being implemented in Morocco, aiming to ensure the growth of a more diversified and competitive economy, capable of withstanding a variety of shocks.

## 2.3 Empirical literature review

Table 1 presents a literature review of ten studies examining the impact of FDI and exports on economic growth in different countries, summarizing the main findings of various empirical studies conducted in developing countries. The studies vary in their geographical scope, ranging from Pakistan to Algeria, Tunisia, Morocco, India and Ghana. The factors used in each study often include real GDP, FDI, domestic investment, exports and other economic factors. The methods of analysis employed, incorporate techniques such as ARDL, VECM, OLS, ECM, ARCH, GARCH, and panel analysis. This variety of results and conclusions highlight the importance of a thorough contextual examination to understand the specific impact on economic growth.

**Table 1:** Empirical literature

Title	Author	Variables	Method	Main Findings
The Dynamic of Financial Development, Imports, Foreign Direct Investment and Economic Growth: Cointegration and Causality Analysis in Pakistan	Shahbaz & Rahman, (2012)	Real GDP, FDI, financial development (credit), imports	ARDL	In the long term, FDI, imports, and financial development significantly contribute to economic growth. In the short term, all variables positively and significantly impact growth, though FDI has a minimal effect.
Foreign Direct Investment (FDI) and Economic Growth: an approach in terms of cointegration for the case of Tunisia.	Soltani & Ochi, (2012)	Real GDP, FDI, Human capital, trade openness, financial system	VECM	All variables are significant. FDI and human capital positively impact real GDP. Financial system and trade openness negatively affect real GDP.
Impact of Foreign Direct Investment on Economic Growth in India: A Cointegration Analysis	Sarbapriya, (2012)	Real GDP, FDI	OLS, ECM	Positive link between FDI and real GDP, but FDI not significantly contributing to growth improvement. No long-term equilibrium issue between the two variables.
Impact of Foreign Direct Investment on Economic Growth of Pakistan.	Saqib <i>et al.</i> , (2013)	GDP, FDI, Inflation, Domestic investment, trade, debt	OLS	Significant and negative relationship between FDI and GDP. Inflation and trade negatively affect growth. Domestic investment has a positive impact.
Impact of Foreign Direct Investment on Nigeria's Economic Growth.	M. Adeleke <i>et al.</i> , (2014)	GDP, FDI, Exportation, exchange rate	OLS	Direct positive link between FDI and economic growth. The exchange rate is not significant, while exports have a strong positive impact on growth.
Does human capital constrain the impact of foreign direct investment and remittances on economic growth in Ghana?	Agbola, (2014)	GDP, FDI, human capital, remittance flows, export + import, inflation, GFCF, household consumption expenditure	OLS	FDI and remittance flows positively impact economic growth. Human capital plays a significant role in improvement.
Governance, foreign direct investment, and economic growth in the	Saidi <i>et al.</i> , (2014)	Real GDP per capita, governance variables, FDI, openness rate,	GMM	FDI has a positive and significant link with economic growth, as well as openness rate

MENA region. (2014)		inflation, financial development, human capital		
Foreign direct investments in Morocco: impact on total factor productivity according to the country of origin.	Azeroual, (2016)	TFP, FDI, human capital, trade openness, drought, domestic credit, final consumption expenditure of public administrations	VECM	FDI and exports has a negative impact on Morocco's TFP in the long and short term, except French FDI, which impacts TFP positively.
Impact of foreign direct investment on economic growth in Algeria: "an empirical study using the ARCH and GARCH approach".	Khelifa & Taleb, (2021)	GDP, FDI, inflation, private investment, oil exports	ARCH, GARCH	FD and exports have a positive impact on economic growth, while inflation and private investment negative impact.
Foreign direct investment and economic growth: a dynamic study of measurement approaches and results	Wang <i>et al.</i> , (2022)	FDI, economic growth	Bibliometric analysis	The analysis also showed bi-directional causality between FDI and economic growth globally and in the American region, and non-directional causality in European, Oceanian, Mediterranean, and African regions.
The economic growth effects of foreign direct investment in developing countries	Mejia, (2023)	FDI, economic growth	Panel models	A positive association between foreign capital penetration and growth.

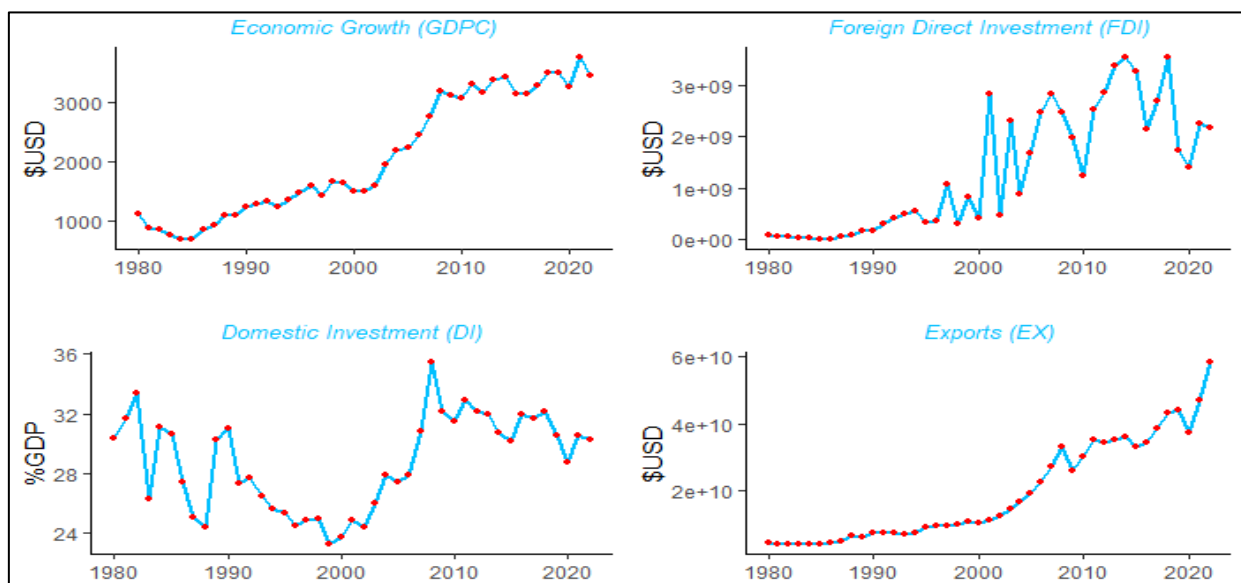
### 3. Methodology

#### 3.1 Study representation

All variables selected in this study, taken from the World Bank, are intended to address our problem in Morocco during the period (1980-2023), as shown in Figure 1. These variables include: economic growth, foreign direct investment, domestic investment and exports, as described in Table 2.

**Table 2:** Variable description

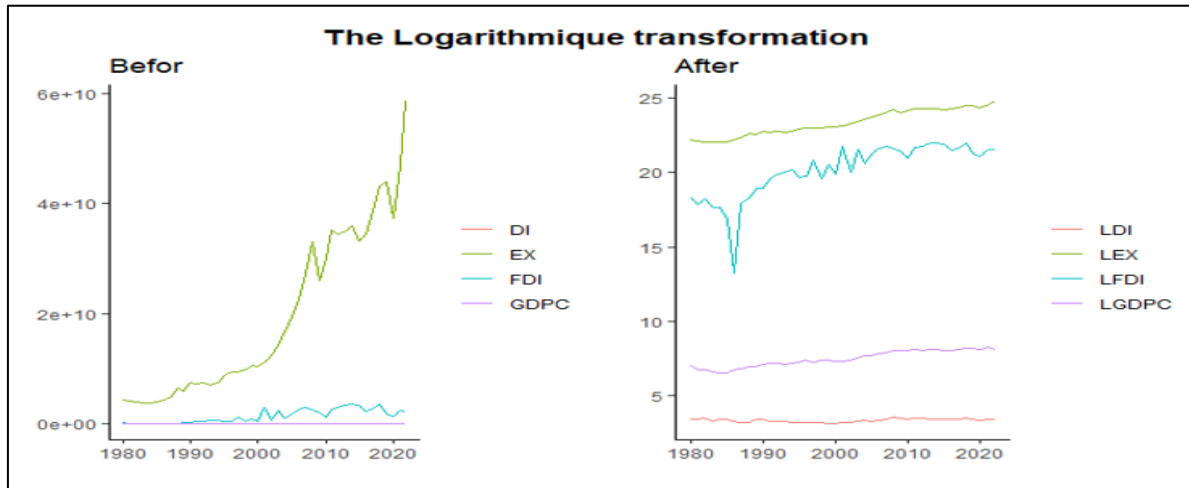
Variable		Description	Unit
GDPG	Economic growth	The rate of economic growth measured by GDP per capita	\$US
FDI	Foreign direct investments	Represent the flow of capital from abroad invested in companies or assets in a given country.	\$US
DI	Domestic investments	Refer to investment expenditures made by the economic residents of a country within their own country, measured by GFCF/GDP.	%GDP
EX	Exports	Represent goods and services produced in a country and sold abroad.	\$US



**Figure 1:** Graphical representation of variables over time

It is important to note that the variables to be studied do not have the same unit of measurement. Logarithmic integration is a technique commonly used in the analysis of economic and statistical data. To make the data more appropriate, it may be necessary to transform these variables into logarithms in order to normalize them and make them comparable. This logarithmic transformation, shown in Figure 2, also helps to stabilize the variance of the data, improve the robustness of the models and ensure better interpretation of the model coefficients.





**Figure 2:** Result of variables transformation

### 3.2 Conception of the study

Table 3 presents the fundamental hypotheses of our study, aimed at examining the impact of key variables on Morocco's economic growth, drawing from the relevant literature review.

**Table 3:** Study hypotheses

H0	Variable	Impact	Hypothesis description
H01	FDI	(+)	Foreign direct investment (FDI) significantly stimulates Moroccan growth.
H02	DI	(+)	Domestic investment acts as a lever for the local economy.
H03	EX	(+)	Exports boost overall market share and growth.

Our proposed model aims to study the relationship between a country's economic growth, represented by the logarithm of GDP per capita, the logarithm of foreign direct investment (LFDI), the logarithm of domestic investment (LDI) and the logarithm of exports (LEX), based on past data, the specified time regression equation is:

$$\begin{aligned}
 GDPC_t = & \alpha_0 + \alpha_1 \sum_{i=1}^p L_i(LGDPC)_{t-i} + \alpha_2 \sum_{i=1}^p L_i(LFDI)_{t-i} + \alpha_3 \sum_{i=1}^p L_i(LDI)_{t-i} \\
 & + \alpha_4 \sum_{i=1}^p L_i(LEX)_{t-i} + \epsilon_t
 \end{aligned}$$

With:

- $LGDPC_t$  represents the logarithm of GDP per capita at the time  $t$ .
- $LFDI_t$  the logarithm of foreign direct investments at the time  $t$ .
- $LDI_t$ , represents the logarithm of domestic investments at the time  $t$  (expressed as gross fixed capital formation (GFCF) relative to GDP).
- $LEX_t$  for the logarithm of exports at the time  $t$ .
- $\alpha_i$  coefficients, represent the parameters to be estimated in the model.
- $\epsilon_t$  is the error term.
- $L_i$  (e.g.,  $L_1(x_t) = x_{t-1}$ ), the lag operators are used to capture the delayed effects

of explanatory variables on economic growth.

This model will allow us to analyze how changes in foreign direct investment, domestic investment, exports and GDP per capita over past periods affect current economic growth.

## 4. Result

### 4.1 Descriptive analysis

**Table 4.** Descriptive statistics

	GDPC	FDI	DI	EX	LGDPC	LFDI	LDI	LEX
nbr.val	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00
nbr.null	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nbr.na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
min	666.72	5.491825e+05	23.24	3.697959e+09	6.50	13.22	3.15	22.03
max	3767.52	3.544387e+09	35.51	5.866145e+10	8.23	21.99	3.57	24.80
range	3100.81	3.543838e+09	12.27	5.496349e+10	1.73	8.77	0.42	2.76
sum	88762.78	5.654107e+10	1238.66	8.289596e+11	322.41	865.71	144.25	1003.45
median	1627.14	8.933254e+08	30.18	1.113124e+10	7.39	20.61	3.41	23.13
mean	2064.25	1.314909e+09	28.81	1.927813e+10	7.50	20.13	3.35	23.34
SE.mean	156.04	1.816458e+08	0.48	2.312411e+09	0.08	0.28	0.02	0.13
CI.mean.0.95	314.89	3.665760e+08	0.97	4.666634e+09	0.17	0.56	0.03	0.27
var	1046928.86	1.418793e+18	9.98	2.299315e+20	0.29	3.35	0.01	0.77
std.dev	1023.20	1.191131e+09	3.16	1.516349e+10	0.54	1.83	0.11	0.88
coef.var	0.50	9.100000e-01	0.11	7.900000e-01	0.07	0.09	0.03	0.04
skewness	0.23	4.200000e-01	-0.09	6.900000e-01	-0.18	-1.43	-0.21	0.00
skew.2SE	0.32	5.900000e-01	-0.12	9.500000e-01	-0.25	-1.97	-0.29	0.01
kurtosis	-1.61	-1.370000	-1.23	-8.100000e-01	-1.37	2.57	-1.27	-1.49
kurt.2SE	-1.13	-9.700000e-01	-0.86	-5.700000e-01	-0.96	1.81	-0.89	-1.05
normtest.W	0.88	8.700000e-01	0.94	8.600000e-01	0.91	0.85	0.94	0.91
normtest.p	0.00	0.00	0.03	0.00	0.00	0.00	0.02	0.00

In Table 4, descriptive statistics are provided for transformed and non-transformed variables, divided into three distinct groups for clarity and organization. The first group encompasses basic statistical measures such as the number of observations, null and missing values. This group offers a fundamental overview of data availability and completeness for the variables.

The second group delves into measures related to the central tendency and dispersion of each variable. This includes statistics such as the minimum, maximum, median, mean and standard deviation. These measures provide insights into the distributional characteristics and variability within the data. The logarithmic transformation, stabilize the variance in our data (var, std.dev).

The last group focuses specifically on assessing the normality of the variables through skewness, kurtosis and the Shapiro-Wilk test. This test produces statistics (normtest.W) and corresponding p-values (normtest.p) to evaluate whether the data follows a normal distribution. According to our statistics, all variables are not normally distributed.

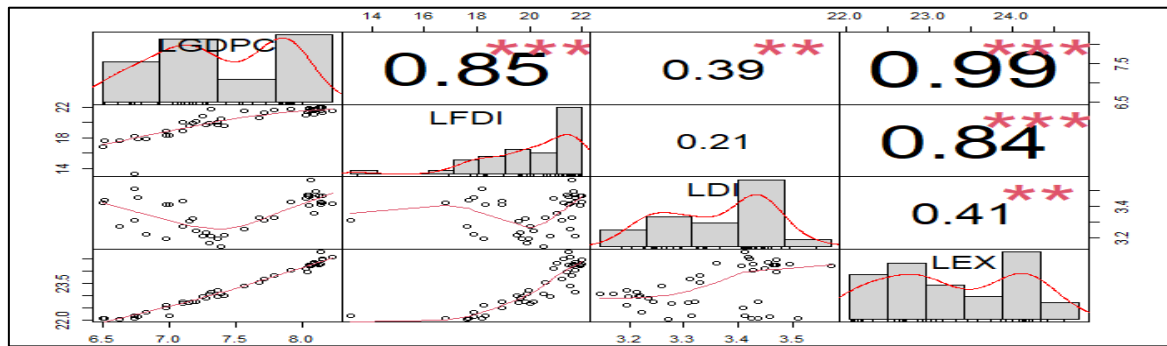


Figure 3: Correction results

The correlation coefficient is a measure of the strength and direction of the linear relationship between two variables. The correlation graph is shown in Figure 3 indicates a statistically significant positive linear relationship between variables and economic growth. Specifically, exportations are strongly and positively correlated (0.99), and foreign direct investments (0.85).

Table 5: Stationarity results

	Dickey_Fuller	Phillips_Perron	P_value	Result	Ordre d'intégration
FDI	-1.922060	-35.956900	0.6044994	Non-stationary	I(1)
DI	-1.613578	-10.592894	0.7263568	Non-stationary	I(1)
EX	-1.040094	-2.594058	0.9205125	Non-stationary	I(1)
GDPG	-2.043554	-11.953688	0.5565064	Non-stationary	I(1)
LDI	-1.594632	-10.044053	0.7338408	Non-stationary	I(1)
LGDPC	-2.133497	-16.822893	0.5209770	Non-stationary	I(1)
LFDI	-1.979051	-26.108328	0.5819868	Non-stationary	I(1)
LEX	-2.333892	-13.991067	0.4418163	Non-stationary	I(1)

Table 5 shows the results of stationarity tests utilizing the Dickey-Fuller and Phillips-Perron strategies for different financial factors. It appears that all factors, counting FDI, DI, EX, GDPG, and others transformed, are non-stationary with an order of integration (I(1)). This proposes that all factors have unit roots and require differencing once to achieve stationarity. These results are pivotal for consequent investigations, especially in building econometric models, especially the Vector Error Correction Model (VECM), where factors should ideally have the same integration order. Enders, (2015), Johansen, (1995) and Lütkepohl, (2006) emphasize the necessity that "the variables in a VECM must be integrated of the same order"

#### 4.2 Cointegration and VECM

In Table 6 the results of optimal lag selection utilizing different criteria such as the Akaike Information Criterion (AIC), Hannan-Quinn Criterion (HQ), Schwarz Criterion (SC), and Final Prediction Error (FPE) are outlined. According to table, 1 is the best lag option based on all criteria.

**Table 6: Optimal lag selection**

Critère	L1	L2	L3	L4	L5	Selection
AIC(n)	-15.606	-15.269	-15.590	-15.280	-15.162	<b>1</b>
HQ(n)	-15.300	-14.717	-14.792	-14.237	-13.875	<b>1</b>
SC(n)	-14.744	-13.718	-13.349	-12.349	-11.543	<b>1</b>
FPE(n)	0.000	0.000	0.000	0.000	0.000	<b>1</b>

**Table 7: Cointegration results**

Cointegration test	Test statistic	10pct	5pct	1pct
r ≤ 3	0.16	6.50	8.18	11.65
r ≤ 2	6.27	15.66	17.95	23.52
r ≤ 1	17.84	28.71	31.52	37.22
r = 0	49.67	45.23	48.28	55.43

Note:r: the number of cointegrating relationships.

According to Table 7, there is 1 cointegrating relationship in the long term, the test statistic for r = 0 is greater than the critical value at 5% (49.67 > 48.28), so we reject the null hypothesis that there is no cointegrating relationship (r = 0 rejected), the hypothesis r ≤ 1 for a number of cointegrating relationships less than or equal to 1 is not rejected and it is the same case for r ≤ 2, and r ≤ 3.

**Table 8: Long-run relationship**

ect1	
LGDPC	1.0000000
LFDI	-0.0978295
LDI	-0.3818511
LEX	-0.4360153

Table 8 illustrates the long-run equilibrium relationship between real GDP per capita (LGDPC) and the other variables, where the coefficients represent the respective impacts of foreign direct investment (LFDI), domestic investment (LDI), and exports (LEX) on real GDP per capita in the long run as following:

$$LGDPC_t = 0.098LFDI_t + 0.382LDI_t + 0.436LEX_t + ect$$

The equation suggests that in the long run, foreign direct investment (LFDI), domestic investment (LDI), and exports (LEX) have positive impacts on real GDP per capita (LGDPC). Specifically, an increase in foreign direct investment by one unit leads to an increase in real GDP per capita by 0.098 units. In contrast, a similar increase in domestic investment and exports results in larger impacts of 0.382 and 0.436 units on real GDP per capita, respectively. These findings imply that all three factors contribute positively to the Moroccan country's overall economic output and welfare, with exports having the most substantial impact, followed by domestic investment and foreign direct investment.

The Vector Error Correction Model estimated in Table 9, is a technique used to analyze the short-run dynamics of a system of variables while integrating the impact of long-run equilibrium relationships. VECM is used to estimate the short-run relationships based on differentiated variables, this model is based on the concept of cointegration, which assumes a long-run equilibrium relationship between the variables. The model is then adjusted to account for any deviations from this long-run equilibrium in the short run.

**Table 9:** VECM results

	Dependent variable			
	LGDP.d	LFDI.d	LDI.d	LEX.d
	(1)	(2)	(3)	(4)
<b>ect1</b>	-0.25 (0.22)	9.94*** (1.67)	0.03 (0.19)	0.18 (0.26)
<b>constant</b>	-1.43 (1.30)	58.97*** (9.90)	0.19 (1.10)	1.13 (1.56)
<b>LGDP.d11</b>	0.04 (0.23)	6.79*** (1.73)	-0.29 (0.19)	0.48 (0.27)
<b>LFDI.d11</b>	0.02 (0.02)	-1.08*** (0.15)	0.00 (0.02)	0.01 (0.02)
<b>LDI.d11</b>	0.09 (0.19)	-1.72 (1.48)	-0.24 (0.17)	0.01 (0.23)
<b>LEX.d11</b>	0.01 (0.20)	-1.60 (1.52)	0.29 (0.17)	-0.33 (0.24)
<b>R<sup>2</sup></b>	0.18	0.68	0.13	0.34
<b>Adj. R<sup>2</sup></b>	0.04	0.62	-0.01	0.23
<b>Num. obs.</b>	41	41	41	41
<b>RMSE</b>	0.09	0.71	0.08	0.11

**Note:** (Standard deviation) ; \*p\*\*\*p\*\*\*p : <0.1,0.05,0.01.

According to Table 9, focusing on the first equation, which is related to the variable of Gross Domestic Product per Capita.

$$\Delta \text{LGDP}_t = -0.25 \text{ect} - 1.43 + 0.04 \Delta \text{LGDP}_{t-1} + 0.02 \Delta \text{LFDI}_{t-1} + 0.09 \Delta \text{LDI}_{t-1} + 0.01 \Delta \text{LEX}_{t-1}$$

Overall, this equation provides insights into the short-run dynamics of GDP per capita, emphasizing resistance to economic shocks, the roles of feedback effects and providing insights into how past changes in the variation of foreign direct investment, domestic investment, exports, and real GDP per capita itself influence the current dynamics of economic growth in Morocco.

The cointegration coefficient ect1 indicates the speed of adjustment, the rate at which the system adjusts towards its long-term equilibrium after an economic shock. This coefficient suggests that around 25% of the long-term equilibrium correction is achieved within a year. In other words, each year, in Morocco each economic shock in PDPC is absorbed at a pace of 25%.

Firstly, the coefficient of 0.04 on  $\Delta LGDPC_{t-1}$  signifies those past increases in real GDP per capita variations, and positively impact current economic growth. This suggests the short feedback mechanism where previous economic expansions have tended to reinforce current Moroccan growth.

Secondly, the coefficient of 0.02 on  $\Delta LFDI_{t-1}$  indicates that past increases in foreign direct investment contribute to ongoing economic expansion. This implies that investments from abroad play a significant role in driving national economic growth in the short term.

Conversely, the coefficient of 0.09 on  $\Delta LDI_{t-1}$  suggests that past increases in domestic investment enhance current domestic economic growth. This highlights the importance of domestic investment in fostering economic development and prosperity.

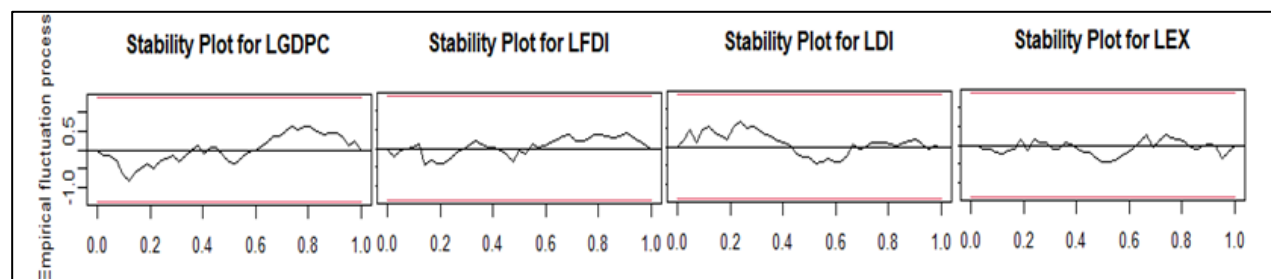
Lastly, the coefficient of 0.01 on  $\Delta LEX_{t-1}$  suggests that past increases in exports positively impact current economic growth. This underscores the crucial role of Moroccan exports in driving economic activity and supporting overall growth trends.

### 4.3 Model diagnostics and forecast

After estimating our Vector Error Correction Model (VECM), it is crucial to validate the statistical hypotheses to ensure the significance and reliability of the model. To achieve this, we conduct tests on the residuals of our model to assess autocorrelation, heteroskedasticity, and normality. Additionally, we perform tests to evaluate the structural stability of our model and its coefficients. The results of these tests, summarized in Table 10, help verify the robustness of our model and ensure its suitability for making reliable economic forecasts.

**Table 10: Model evaluation**

Test Used	Null Hypothesis	P-value
Serial.test	No autocorrelation	0.9945
Arch.test	Homoscedasticity	1
Normality.test	Normality	0.1181
Stability		

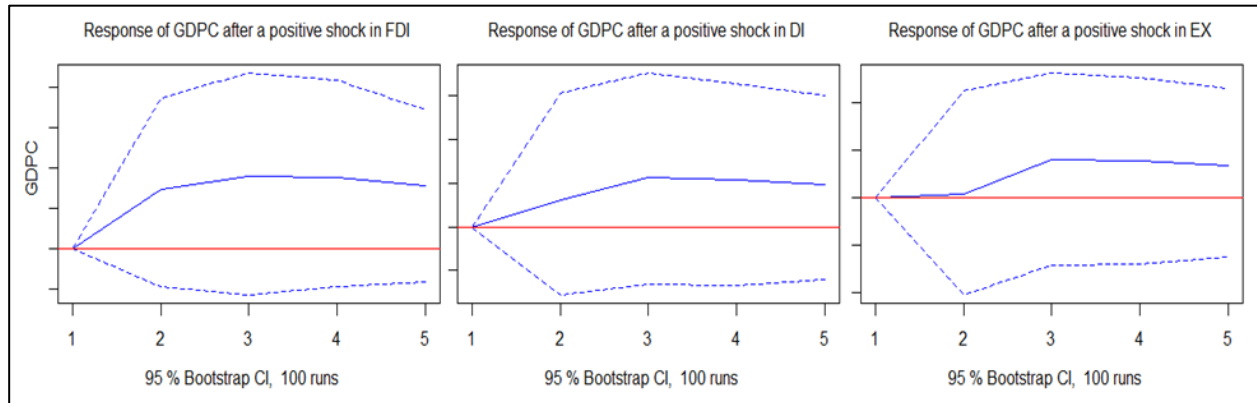


**Figure 4: Structural stability test**

According to the test graphs in Figure 4, there are no points outside the red interval, thus indicating the stability of our model.

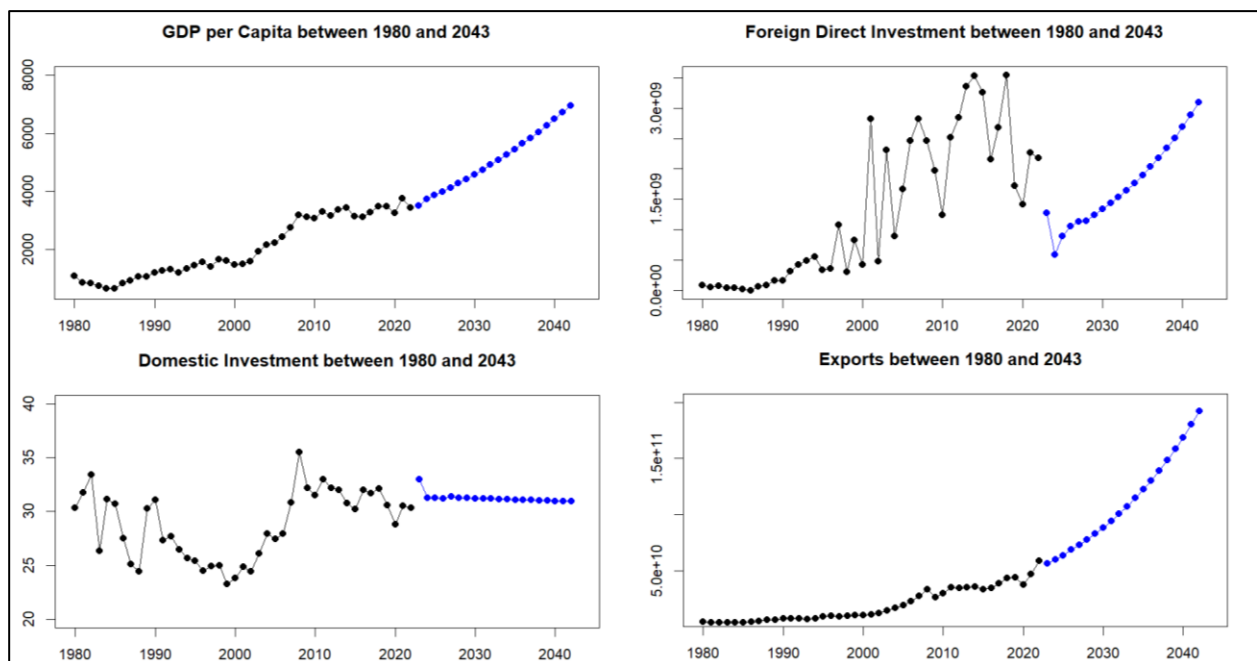
The analysis of impulse response functions, as presented in Figure 5, enables one to discern the reaction or impact experienced by a variable when a shock occurs in

another variable. In our study, our focus lies on investigating the response of economic growth to a positive shock induced by our variables. The analysis illustrates that any shocks in each of our variables -FDI, domestic investment and exports- have positive and significant effects on Moroccan economic growth.



**Figure 5:** Impulse response

Finally, forecasting is the objective of any model, typically achieved through econometric methods using the estimated model to anticipate future values of economic variables. A forecast can be described as a collection of probabilities linked with upcoming events. This prediction is based on the information available at the time  $t$  when the model was formulated, this collection represents the data, knowledge, and theories available regarding the phenomenon we aim to predict.



**Figure 6:** The future in Morocco

The forecasts from our model, presented in Figure 6, paint a promising future for Morocco's economic landscape. According to our projections, Morocco's GDP per capita will continue its upward trajectory, surpassing \$7000 by the year 2042. This optimistic outlook is encouraging for both the country and its population. The projected increase can be attributed to the expansion of exports and foreign direct investments. While our model illustrates the positive impact of foreign direct investment on GDP per capita, it also indicates that domestic investments will remain stable ( $DI = GDP / FBCF$ ). Therefore, Morocco's policy aimed at fostering both GDP and domestic investments appears to be conducive to the country's economic future.

Table 11 provides a comprehensive summary of the empirical results obtained in this research. Each hypothesis explores the relationship between the variables and economic growth, considering both short-term and long-term perspectives.

**Table 11:** Summary of the empirical results

Hypotheses				Result	
H0	Variable	Impact	Hypothesis description	Court Terme	Long Terme
H01	FDI	(+)	Foreign direct investment (FDI) significant stimulates Moroccan growth.	(+)	(+)
H02	DI	(+)	Domestic investment acts as a lever for the local economy.	(+)	(+)
H03	EX	(+)	Exports boost overall market share and growth.	(+)	(+)

**Note:** Results are significant, rigorously tested, and validated in Table 10.

The empirical results demonstrate significant and positive relationships between key variables and Moroccan economic growth. Foreign Direct Investment (FDI) has a significant stimulating effect on economic growth in both the short term and long term, supporting Hypothesis H01. Similarly, domestic investment (DI) is shown to act as a catalyst for the local economy, contributing positively to growth in both the short and long terms, confirming Hypothesis H02. Additionally, exports (EX) are found to enhance market share and overall growth, with significant impacts observed in both the short and long terms, as hypothesized in H03.

## 5. Discussion

The results of this study provide valuable insights into the determinants of economic growth in Morocco, with a focus on the roles of foreign direct investment (FDI), domestic investment (DI), and exports (EX). The findings demonstrate significant positive impacts of these factors on real GDP per capita over both short and long-term periods, highlighting their synergistic role in driving economic development and enhancing Morocco's global competitiveness.

The findings of this study are consistent with previous research on the determinants of economic growth in developing countries. For example, Khelifa & Taleb,



(2021) and Mejia, (2023) both emphasize the positive impact of foreign direct investment (FDI) on economic growth, a trend mirrored in the present study's results. Similarly, the significant role of exports (EX) in driving economic growth aligns with the conclusions drawn by Khelifa & Taleb, (2021), Saidi *et al.*, (2014) and Wang *et al.*, (2022), highlighting the importance of trade openness and global market integration. Additionally, the positive association between domestic investment (DI) and economic growth resonates with the findings of Soltani & Ochi, (2012) and Agbola, (2014), underscoring the crucial role of domestic capital formation in fostering sustainable development.

In contrast to perspectives suggesting negative impacts of certain economic factors on growth, particularly trade openness, as concluded by researchers such as Azeroual, (2016), Saqib *et al.*, (2013), and Soltani & Ochi, (2012), our study presents findings that diverge from this notion. While these studies have emphasized potential drawbacks of trade openness, such as concerns over economic dependency or adverse effects on local industries, our research reveals positive outcomes for Moroccan economic growth associated with trade liberalization and increased exports and technologies.

Our findings highlight the short-term dynamics of FDI, DI, and EX in driving economic growth, emphasizing Morocco's ability to resist economic shocks and maintain stability over time. By understanding and leveraging these dynamics, policymakers can implement strategies to further enhance the country's resilience and promote sustainable economic development.

## 6. Conclusion

This study has provided valuable insights into the determinants of economic growth in Morocco, focusing on the roles of foreign direct investment (FDI), domestic investment (DI), and exports (EX). Through both short- and long-term econometric analyses, we have uncovered the significant positive impacts of these factors on real GDP per capita, highlighting their synergistic role in driving economic development and enhancing Morocco's global competitiveness.

In the long run, our analysis reveals that FDI, DI, and EX all have positive impacts on GDP per capita. Specifically, an increase in FDI by one dollar leads to a \$0.098 increase in GDP per capita. In contrast, similar increases in DI and EX result in larger impacts of 0.382% GDP and \$0.436 units, respectively. These coefficients underscore the importance of all three factors in driving Morocco's economic growth and enhancing its global competitiveness.

In the short run, our analysis suggests that around 25% of the long-term equilibrium correction is achieved within a year in Morocco. This indicates that the Moroccan economy has a mechanism to absorb economic shocks at a relatively rapid pace, contributing to its overall stability and resilience. Additionally, the results show that past increases in FDI, DI, and EX positively influence current economic growth. For instance, a 1% variation increase in FDI in the previous period contributes to a 0.02% increase in GDP per capita in the current period. Similarly, past increases in DI and EX

also have positive impacts on current economic growth, with coefficients of 0.09% and 0.01%, respectively.

Looking ahead, the forecasts presented in the study paint a promising picture of Morocco's economic future. With continued expansion in exports and foreign direct investments, Morocco's GDP per capita is projected to rise steadily, signaling sustained economic growth and prosperity for the country and its population.

### **Conflict of Interest Statement**

The author declares no conflicts of interest.

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### **References**

- Achahchah, H., & Allah, S. E. H. (2023). The Impact of the Investment Climate on Encouraging Foreign Direct Investment: Morocco's New Reforms. *International Journal of Strategic Management and Economic Studies (IJSMES)*, 2(6), Article 6. <https://doi.org/10.5281/zenodo.10252781>
- Agbola, F. W. (2014). Does human capital constrain the impact of foreign direct investment and remittances on economic growth in Ghana? *Applied Economics*, 45(19), 2853–2862. <https://doi.org/10.1080/00036846.2012.676735>
- Al Samman, H., & Akkaş, E. (2022). How Do the Crises of Falling Oil Prices and COVID-19 Affect Economic Sectors in the Rentier Economies? Evidence from the GCC Countries. *Journal of Economy Culture and Society*, 0(0), 0–0. <https://doi.org/10.26650/JECS2021-848096>
- Auktor, V. G. (2022). The opportunities and challenges of Industry 4.0 for industrial development: A case study of Morocco's automotive and garment sectors. *Discussion Paper*. <https://doi.org/10.23661/DP2.2022>
- Azeroual, M. (2016). The Impact of Foreign Direct Investment on the Productivity Growth in the Moroccan Manufacturing Sector: Is Source of FDI important? *Journal of International and Global Economic Studies*, 9(1).
- Banque Africaine de Développement. (2022). *Maroc – Programme de Réformes Économiques et Sociales (PRES)*. Banque Africaine de Développement et Ministère Des Finances Au Maroc. <https://projectsportal.afdb.org/dataportal/VProject/show/P-MA-K00-002?lang=fr>

- Batool, K., & Akbar, M. (2023). Influence of Infrastructure Development with its Sub-sectors on Economic Growth in Selected Asian Countries: An Empirical Analysis using DOLS and FMOLS Approaches. *Pakistan Journal of Humanities and Social Sciences*, 11(2), 2236–2253. <https://doi.org/10.52131/pjhss.2023.1102.0517>
- Belhaj, I. (2019). The policy of attracting foreign direct investment to Morocco: Analysis and prospects L. *Journal d'Economie, de Management, d'Environnement et de Droit*, 2(1), Article 1. <https://doi.org/10.48398/IMIST.PRSM/jemed-v2i1.15465>
- Bourhriba, O., & Mandri, B. (2022). Réinvestissement des IDE au Maroc: Un potentiel à exploiter. *Policy Center*. [https://www.policycenter.ma/sites/default/files/2023-01/PB\\_01-23\\_Bourhiba-Mandri.pdf](https://www.policycenter.ma/sites/default/files/2023-01/PB_01-23_Bourhiba-Mandri.pdf)
- Chebh Ismail & Nouredine Abdellatif. (2022). Attractiveness of foreign direct investment and economic growth: The case of Morocco. <https://doi.org/10.5281/zenodo.6386450>
- Enders, W. (2015). *Applied Econometric Time Series, 4th Edition* | Wiley. Wiley. <https://www.wiley.com/en-us/Applied+Econometric+Time+Series%2C+4th+Edition-p-9781118808566>
- Financial Times. (2023). *A drive to thrive: How Morocco's industrial platform has taken off*. <http://www.ft.com/partnercontent/morocco-now/a-drive-to-thrive-how-moroccos-industrial-platform-has-taken-off.html>
- Forbes Africa. (2024). *Morocco: Unlocking Opportunities At The Crossroads Of Continents*. <https://www.forbesafrica.com/africa-undiscovered/2024/02/01/driving-sustainable-innovation-iin-north-africa/>
- Harbal, A., & Khihel, F. (2023). The impact of interactions between public and private investment on improving the business climate in Morocco. <https://doi.org/10.5281/zenodo.7785936>
- Iddrisu, K., Abor, J. Y., Insaideo, M., & Banyen, K. T. (2023). Does China's Flow of FDI and Institutional Quality Matter for Poverty? Evidence from Sub-Saharan Africa. *Journal of Asian and African Studies*, 00219096231188948. <https://doi.org/10.1177/00219096231188948>
- International Trade Administration. (2024). *Morocco—Trade Agreements*. <https://www.trade.gov/country-commercial-guides/morocco-trade-agreements>
- Jean, T. (2023). Morocco leads the way in FDI project records (*Le Maroc en tête des records d'IDE en projet*) | *Challenge.ma*. <https://www.challenge.ma/attractivite-des-ide-le-maroc-en-tete-des-records-dide-en-projet-270511/>
- Joachim, C. (2021). *Investissements étrangers au Maroc: Des réformes légales qui renforcent l'attractivité*. La Tribune. <https://afrique.latribune.fr/think-tank/tribunes/2021-10-19/investissements-etrangeurs-au-maroc-des-reformes-legales-qui-renforcent-l-attractivite-894349.html>
- Johansen, S. (1995). *Likelihood-Based Inference in Cointegrated Vector Autoregressive Models* | Oxford Academic. <https://academic.oup.com/book/27916>

- Khelifa, F. Z., & Taleb, F. (2021). The investment climate and the attractiveness of foreign direct investment in Algeria (empirical study for the period 2000-2019). *مجلة البشائر الاقتصادية*, 7(3), 791–777.
- Lütkepohl, H. (2006). *New Introduction to Multiple Time Series Analysis* | SpringerLink. <https://link.springer.com/book/10.1007/978-3-540-27752-1>
- M Adeleke, K., S.o, O., & Oluwafolakemi, F. O. (2014). Impact of Foreign Direct Investment on Nigeria Economic Growth. *International Journal of Academic Research in Business and Social Sciences*, 4(8), 234–242.
- Machloukh, A. (2024). *Interview with Zakaria Farahat: 'Between January and August 2023, Morocco attracted 10 times more investment than the average over the last 10 years.* L'Opinion Maroc - Actualité et Infos au Maroc et dans le monde. [https://www.lopinion.ma/Entretien-avec-Zakaria-Farahat-Le-Maroc-a-attire-entre-janvier-et-aout-2023-10-fois-plus-d-investissements-que-la\\_a49572.html](https://www.lopinion.ma/Entretien-avec-Zakaria-Farahat-Le-Maroc-a-attire-entre-janvier-et-aout-2023-10-fois-plus-d-investissements-que-la_a49572.html)
- Mejia, S. A. (2023). The economic growth effects of foreign direct investment in developing countries, 1980–2019. *International Journal of Sociology*, 53(4), 239–260. <https://doi.org/10.1080/00207659.2023.2226484>
- Ministère des Finances. (2020). Maroc-Afrique: Une coopération renouvelée. *Al Maliya*.
- Moussir, C.-E., & Tabit, S. (2016). *Diversification des exportations et transformation structurelle au Maroc: Quel rôle pour les IDE ?* [MPRA Paper]. <https://mpra.ub.uni-muenchen.de/76582/>
- OCED. (2011). *Maroc – Stratégie de développement du climat des affaires.* <https://www.oecd.org/fr/pays/maroc/marocstrategiededeveloppementduclimatdesaffaires.htm>
- Saidi, Y., Soltani, H., & Ochi, A. (2014). Gouvernance, investissement direct étranger et croissance économique dans la région MENA. *International Conference on Business, Economics, Marketing & Management Research*, 3, 71–75.
- Saqib, D. N., Masnoon, M., & Rafique, N. (2013). Impact of Foreign Direct Investment on Economic Growth of Pakistan. *Advances in Management and Applied Economics*, 3(1), 1–3.
- Sarbapriya, R. (2012). Impact of Foreign Direct Investment on Economic Growth in India: A Co integration Analysis. *Advances in Information Technology and Management*, 2.
- Sauvant, K. P. (2021). Improving the distribution of FDI benefits: The need for policy-oriented research, advice, and advocacy. *Journal of International Business Policy*, 4(2), 244–261. <https://doi.org/10.1057/s42214-021-00109-6>
- Shahbaz, M., & Rahman, M. M. (2012). The Dynamic of Financial Development, Imports, Foreign Direct Investment and Economic Growth: Cointegration and Causality Analysis in Pakistan. *Global Business Review*, 13(2), 201–219. <https://doi.org/10.1177/097215091201300202>
- Soltani, H., & Ochi, A. (2012). Foreign Direct Investment (FDI) and Economic Growth: An approach in terms of cointegration for the case of Tunisia. *Journal of Applied Finance & Banking*, 2(4).

[https://econpapers.repec.org/article/sptapfiba/v\\_3a2\\_3ay\\_3a2012\\_3ai\\_3a4\\_3af\\_3a2\\_5f4\\_5f13.htm](https://econpapers.repec.org/article/sptapfiba/v_3a2_3ay_3a2012_3ai_3a4_3af_3a2_5f4_5f13.htm)

- Sunde, T., Tafirenyika, B., & Adeyanju, A. (2023). Testing the Impact of Exports, Imports, and Trade Openness on Economic Growth in Namibia: Assessment Using the ARDL Cointegration Method. *Economies*, 11(3), Article 3. <https://doi.org/10.3390/economies11030086>
- Swe, H. Y. (2019). *Analysis of Long Run and Short Run Relationship between Myanmar's Economy and Infrastructure-Social Investment*. <https://www.semanticscholar.org/paper/Analysis-of-Long-Run-and-Short-Run-Relationship-and-Swe/d953387fea0906a5392fe14ee6c9f5ad8da61867>
- Wang, X., Xu, Z., Qin, Y., & Skare, M. (2022). Foreign direct investment and economic growth: A dynamic study of measurement approaches and results. *Economic Research-Ekonomska Istraživanja*, 35(1), 1011–1034. <https://doi.org/10.1080/1331677X.2021.1952090>
- World Bank. (2022). *Foreign direct investment can help global value chain integration*. World Bank Blogs. <https://blogs.worldbank.org/en/psd/foreign-direct-investment-can-help-global-value-chain-integration>
- World Bank. (2023). *Morocco: Boosting private-sector competitiveness for export success*. World Bank Blogs. <https://blogs.worldbank.org/en/trade/morocco-boosting-private-sector-competitiveness-export-success>

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