

A Comparative Analysis of the Impact of Macroeconomic Strategies on Foreign Investment in Southern Mediterranean Countries

التحليل المقارن لاثـر الاستراتيجيات الاقتصادية الكلية على الاستثمار الأجنبي في دول جنوب المتوسط

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Abstract:

This study highlights the impact of macroeconomic strategies on attracting foreign investment in Southern Mediterranean countries, with a focus on the importance of regional and global partnerships in promoting economic growth. Panel data models were utilized using R software to analyze the relationship between foreign investment and key factors, including GDP, growth rates, government stability, management efficiency, workforce qualifications, education, democracy, and anti-corruption measures. The findings revealed systemic challenges, most notably the decline of investments in non-energy sectors in Algeria to less than 5%, underscoring the need for independent regional and legislative frameworks to enhance investment. The study recommended establishing participatory economic structures, unifying investment laws, coordinating policies through economic parliaments, and creating transparent arbitration bodies for conflict resolution. These measures aim to foster regional integration, attract sustainable investments, and support long-term development in the region.

Keywords: Foreign Direct Investment; Macroeconomic Strategies; Southern Mediterranean Countries; Economic Development; Government Stability.

JEL Classification Codes: F21, O16, E02, O43, P48.

ملخص:

تبرز هذه الدراسة تأثير الاستراتيجيات الاقتصادية الكلية على جذب الاستثمار الأجنبي في دول جنوب المتوسط، مع التركيز على أهمية الشراكات الإقليمية والعالمية في تعزيز النمو الاقتصادي، تم الاعتماد على نماذج البانل باستخدام برمجية R لتحليل العلاقة بين الاستثمار الأجنبي والعوامل الرئيسية، بما في ذلك الناتج المحلي الإجمالي، معدلات النمو، استقرار الحكومة، كفاءة الإدارة، مؤهلات القوى العاملة، التعليم، الديمقراطية، ومكافحة الفساد. كشفت النتائج عن تحديات نظامية، أبرزها انخفاض الاستثمارات في القطاعات غير الطاقوية في الجزائر إلى أقل من 5%، مما يؤكد الحاجة إلى أطر إقليمية وتشريعية مستقلة لتعزيز الاستثمار. كما أوصت الدراسة بإنشاء هيكل اقتصادي تشاركي، وتوحيد قوانين الاستثمار، وتنسيق السياسات عبر برلمانات اقتصادية، وإنشاء هيئات تحكيم شفافة لحل النزاعات. تهدف هذه التدابير إلى تعزيز التكامل الإقليمي، وجذب الاستثمارات المستدامة، ودعم التنمية طويلة الأجل في المنطقة.

كلمات مفتاحية: الاستثمار الأجنبي المباشر؛ الاستراتيجيات الاقتصادية الكلية؛ دول جنوب المتوسط؛ التنمية الاقتصادية؛ استقرار الحكومة.

تصنيفات JEL : P48، O43، E02، O16، F21 .

INTRODUCTION:

Despite the abundance of material, financial, and human resources in Mediterranean countries, structural reforms have largely failed to address critical socio-economic challenges. Among these issues, the illegal migration of youth seeking better opportunities underscores the urgency of implementing more effective investment strategies. Strategic inbound investment management has become essential for fostering economic reform, ensuring prosperity, and achieving stability in these nations. However, disparities in attracting foreign investments exacerbate the challenge of regional economic integration. For instance, in Algeria, investments outside the energy sector constitute less than 5% of total investments, reflecting limited diversification and inefficiencies in creating an attractive investment climate (Aizenman & Jinjarak, 2012).

Foreign direct investment (FDI) serves as a key indicator of a country's commercial and financial stability while promoting economic diversification and social development. It fosters internal economic diversity, expands the base of contributors and partners, and strengthens resilience against emerging global economic blocs (Alfaro et al., 2004). To capitalize on these benefits, Mediterranean countries must enhance regional cooperation and adopt proactive strategies to address barriers such as administrative inefficiency, corruption, and political instability.

This study examines the interactive relationship between FDI and macroeconomic indicators in southern Mediterranean countries using a comparative approach. Unlike traditional analyses focused on quantitative metrics like GDP or growth rates, this research integrates qualitative dimensions such as governance stability, administrative efficiency, workforce qualifications, education standards, democracy levels, and anti-corruption measures. By incorporating these often-overlooked factors, this study aims to provide a comprehensive framework for understanding how FDI can drive sustainable development in the region.

Problematic of the Study

In an era of dominant global economic blocs, fragmented macroeconomic management in southern Mediterranean countries has hindered their ability to attract sustained foreign investments. Despite abundant resources, weak coordination has reduced the added value of inbound investments and raised concerns about their capacity to adopt effective strategies within stable legal frameworks (Aizenman & Jinjarak, 2012). The decline in Algeria's foreign investment inflows after 2015, exemplified by Orascom Telecom's exit due to arbitrary administrative actions, highlights systemic barriers that deter investors and damage confidence (OTH v. Algeria, 2012). To address these challenges, adopting integrated investment systems akin to those in northern Mediterranean countries, where legislative stability and cooperation foster FDI growth, is essential (UNCTAD, 2022).

previous studies

- ***The Effect of Macroeconomic Instability*** on FDI Flows in MENA Countries
Another significant study by Sekkat (2012) examined the impact of macroeconomic volatility on FDI flows in Middle East and North Africa (MENA) countries between 1985 and 2009. The research employed a gravity model to analyze how macroeconomic conditions in source

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countries influenced FDI inflows to host economies. The findings revealed that FDI inflows were positively correlated with host country GDP stability but negatively affected by source country volatility. Additionally, regional trade agreements, particularly those involving European countries, were found to amplify FDI responsiveness to external macroeconomic conditions. This study underscores the importance of stable macroeconomic environments and regional integration in fostering foreign investment (Sekkat, 2012).

- **.Foreign Direct Investment and Economic Growth:** Simultaneous Equation Model Case of Southern Mediterranean Countries. A study by Aydi and Ben Ammou (2019) analyzed the impact of foreign direct investment (FDI) on the economies of eight southern Mediterranean countries between 1985 and 2018. Using a simultaneous equation model, the research demonstrated that FDI positively influences economic growth through mechanisms such as human capital development, technology transfer, and domestic investment. However, the study also highlighted that these positive effects remain limited due to structural inefficiencies and weak institutional frameworks in the region. The findings emphasized the importance of improving human capital and domestic investment to maximize the benefits of FDI (Aydi & Ben Ammou, 2019).

1- LITERATURE REVIEW

1.1. Foreign Investment and Socioeconomic Situation

Foreign investment significantly impacts host countries by attracting capital, technology, and expertise, fostering economic growth through infrastructure development, job creation, and poverty reduction (Aizenman & Jinjark, 2012). It enhances access to education and healthcare while promoting human capital development and technology transfer, which boost productivity and reduce income inequality (Borensztein et al., 1998). Additionally, FDI combats corruption by fostering transparency and accountability in business environments, further encouraging investments (Dreher & Gassebner, 2012). Government stability is critical for FDI as it provides a secure and predictable environment, reducing risks associated with political instability and ensuring sustainable economic development (Jensen, 2003). Collectively, these factors underscore the transformative role of foreign investment in driving socioeconomic progress.

1.2. Foreign Investment and Human Capital Development

Foreign investment plays a pivotal role in enhancing human capital by introducing expertise, advanced technologies, and infrastructure development, which collectively contribute to overall economic growth (Aizenman & Jinjark, 2012). This process not only reduces poverty rates and increases income levels but also promotes social equity by improving access to quality education and affordable healthcare. In North African countries, for example, foreign investment has stimulated growth in key sectors such as industry, tourism, and services. This has directly resulted in job creation and higher incomes for local populations (Aizenman & Jinjark, 2012).

Additionally, foreign investment has significantly contributed to infrastructure development in North Africa. Investments in transportation networks and the construction of modern facilities like airports and ports have enhanced regional connectivity and attracted further foreign investments (Alfaro et al., 2004). These improvements have addressed income

inequality by fostering economic opportunities across various social strata. Moreover, foreign investment facilitates human capital development through technology transfer and workforce training, which increase productivity and narrow the gap between the wealthy and the poor (Alfaro et al., 2004).

In conclusion, foreign investment has had a profound impact on the socioeconomic landscape of North Africa. By enhancing human capital, creating jobs, and improving infrastructure, it has contributed to sustainable economic growth and social development. These advancements underscore the critical role of foreign investment in fostering long-term prosperity for the region.

1.3. Socioeconomic Situation in North African Countries

The socioeconomic landscape in North African countries is shaped by interconnected factors such as income inequality, poverty, education, healthcare access, and infrastructure. These elements collectively determine the quality of life and economic performance. Attracting foreign investment requires financial and intellectual capital alongside advanced technologies, which drive job creation and economic growth (Aizenman & Jinjark, 2012). Social structures and cultural patterns also influence economic outcomes, as seen in Algeria during the 1990s civil war, where political instability deterred investment and slowed growth (Jensen, 2003). Policymakers must consider historical and political contexts to design strategies that attract investments while fostering equitable and sustainable development across the region.

1.4. Anti-Corruption Measures

Administrative and financial corruption, often resulting from inadequate institutional oversight, negatively impacts foreign investment, economic stability, and social conditions. Corruption creates uncertainty and increases operational risks, deterring foreign investors and hindering economic development (Dreher & Gassebner, 2012). Addressing these challenges requires robust anti-corruption measures, such as binding legislation to ensure accountability and justice in enforcement. Establishing a transparent business environment fosters investor confidence and attracts foreign direct investment (FDI). Systematic reforms promoting transparency and reducing bureaucratic inefficiencies further contribute to a stable economic framework conducive to long-term growth. Governments can enhance their reputation as reliable investment destinations by implementing these measures, fostering sustainable economic development.

1.5. Stability of Government

Government stability is a critical factor in attracting foreign investment, as it provides a predictable and secure environment, reducing risks associated with political instability and fostering investor confidence (Jensen, 2003). Stability ensures the protection of property rights, enforcement of contracts, and the implementation of tax incentives and investment promotion measures. These mechanisms create an attractive business climate, encouraging foreign direct investment (FDI) while driving economic growth and improving social welfare (Dreher & Gassebner, 2012). By maintaining consistent policies and transparent legal frameworks, stable governments enhance long-term social and economic development, making their economies reliable destinations for FDI.

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2- METHODOLOGY:

2-1 Data

In order to examine and analyze the various relationships associated with the study hypotheses within the most representative standard model, we propose the following table, which explains the main abbreviations for all the major economic variables included in the study, along with their various sources.

Table(01):the macro economic index's and theme sources

Economic indicator symbol	Economic indicator	Sources (junary 2023)
FDI	Foreign Direct Investment as a Percentage of GD	NU https://unstats.un.org/UNSDWebsite/undatacommons/sdgs/countries=country%2FDZA
GDP	Gross Domestic Product	WDI https://databank.worldbank.org/source/world-development-indicators
GR	Growth Rate of GDP per Capita	WDI
DF	Log of Domestic Credits to the Private Sector as a Percentage of GDP	WDI
DP	Property rights	ICRG https://www.prsgroup.com/explore-our-products/icrg/
EDUT	Logarithm of the Tertiary Enrollment Rate	ICRG
BUR	Bureaucracy	
CORR	Fight against corruption	ICRG
CSE	Socio-economic condition	ICRG
DEM	Democracy	ICRG
SG	Government stability	WDI

Source: prepared by the researcher

2.2.Model

2.2.1. Theoretical Foundation of Panel Models Theory

Panel models are a statistical approach used to analyze data with multiple dimensions, such as sectoral and temporal dimensions, enabling a multidimensional perspective on the studied phenomenon. This method provides a comprehensive understanding of complex relationships by incorporating both cross-sectional and time-series data (Marisa & Theresa, 2011, p. 2). Panel models offer significant advantages, including the ability to utilize large datasets containing repeated observations for the same individuals or sectors over time. This facilitates the analysis of long-term interrelated effects and enhances the robustness of findings. Panel models are categorized into three primary types: the fixed-effects model, the random-effects model, and the pooled regression model. These models are applied across sectoral observations (\$N\$) over a specified time period (T) to examine variations and relationships among variables (Ratla, 2014, p. 151). Each model is suited to specific research contexts,

allowing for flexibility in addressing diverse analytical needs. By leveraging these models, researchers can gain deeper insights into the dynamics of economic phenomena, particularly when exploring multidimensional datasets.

3.2.2 The Advantages of Panel Models

Panel models offer several advantages over other statistical approaches by combining cross-sectional and time-series data, which allows for a more comprehensive analysis of relationships between variables. These models provide deeper insights into the dynamics of variables over time, control for individual or entity-specific effects, and are particularly useful when the dataset includes a limited number of observations per entity or individual (Marisa & Theresa, 2011).

- **Pooled Model**

The pooled model is one of the simplest estimation methods for panel data, as it does not require prior assumptions about the dataset. It assumes that the relationship between dependent and independent variables remains constant across all cross-sections, with minimal differences among them. While this simplicity can be advantageous in certain cases, it may lead to biased or inaccurate estimates if significant differences exist among cross-sections. The pooled model is most appropriate when working with large datasets or when the variation between cross-sections is negligible, ensuring relatively stable relationships across the data (Ratla, 2014).

- **Fixed-Effects Model**

Fixed-effects models account for variations between cross-sections by assuming that each group or entity has unique characteristics that influence the dependent variable. These models allow for differences in relationships between variables across groups while maintaining stability over time. Fixed-effects models are particularly effective in controlling for unobserved heterogeneity, making their results more accurate and less biased compared to pooled models (Johanson, 1997). However, they assume that these differences remain constant over time, which is an important consideration in statistical analysis.

- **Random-Effects Model**

Random-effects models are more flexible than fixed-effects models as they treat cross-sectional differences as random variables rather than fixed parameters. Unlike fixed-effects models, random-effects models allow variations in relationships between variables to fluctuate over time and across groups. This flexibility makes them suitable for datasets where cross-sectional effects are not constant but vary randomly. However, the assumption that random effects are uncorrelated with explanatory variables must hold; otherwise, the model may produce biased results (Ratla, 2014).

4. EMPIRICAL RESULTS AND DISCUSSION

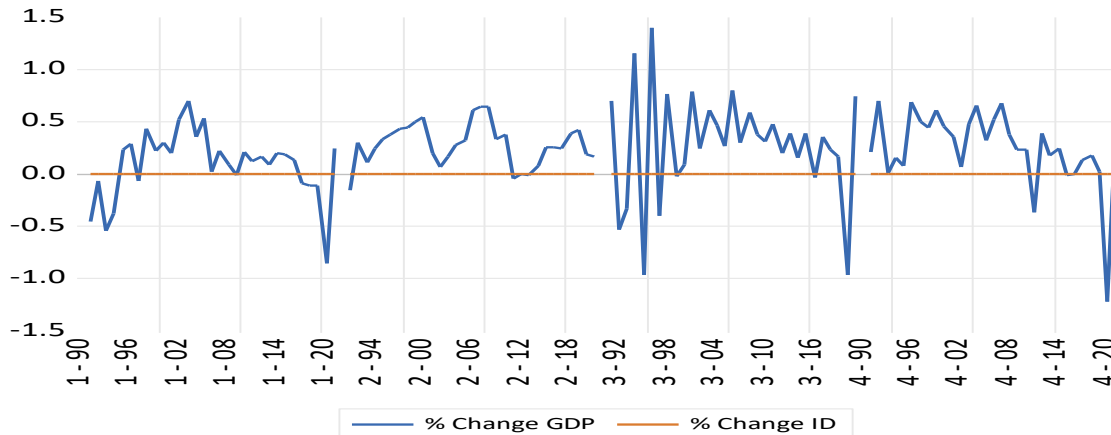
4.1. Quantitative Criteria as an Indicator of Economic Performance's Solvency
Estimating the change in GDP, foreign investment rates, growth rates, and internal debt allocated to investment are considered crucial quantitative indicators in macroeconomics. These indicators help provide insights into the economies of countries located in the southern Mediterranean, specifically Algeria, Egypt, Morocco, and Tunisia.

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4.2. GDP Index and Foreign Investment in South Mediterranean Countries

The Gross Domestic Product (GDP) is a vital indicator that measures the value of all final goods and services produced in a country during a specified period. It is calculated in the local currency and serves as a measure of the economic situation's dynamism.

Fig(01): GDP a trends in South Mediterranean countries from 19 90 _2021.



Source: prepared by the researcher based on Eviews12

The analysis of Gross Domestic Product (GDP) trends for the study sample from 1990 to 2021 reveals significant fluctuations, particularly during the COVID-19 pandemic in 2020, which severely impacted global economic growth. Between 1996 and 2008, Algeria experienced relative economic stability following a decade of political and social unrest. However, GDP performance declined sharply between 2014 and 2020, reflecting both internal challenges and the global repercussions of the pandemic (Urbanovics & Teleki, 2020).

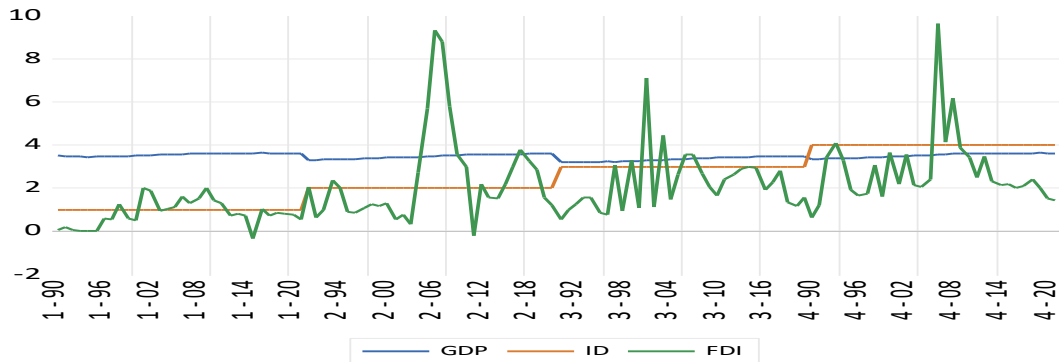
In contrast, Egypt demonstrated positive and consistent GDP stability throughout the study period, aided by relatively modest lockdown measures during the pandemic, which limited economic disruptions (Krafft et al., 2021). Morocco exhibited more pronounced GDP fluctuations, indicative of higher economic dynamism compared to other Mediterranean nations. Tunisia followed a similar pattern but with variations in the magnitude of changes. Notably, the pandemic years of 2019–2020 had a profound impact on growth catalysts across all countries due to widespread economic disruptions and reduced global demand.

These trends underscore the importance of understanding country-specific factors influencing GDP performance, such as political stability, economic diversification, and external shocks like the COVID-19 pandemic. Such insights are critical for designing policies aimed at fostering resilience and long-term economic growth in the region.

4.3. Comparison of GDP and FDI in sample study, 1990-2021

The ability of a state to attract foreign investment is closely linked to indicators that reflect the level of confidence in the legislative and regulatory stability of these countries. In this study, we will compare the percentage change in GDP to the percentage change in foreign investment among the selected South Mediterranean countries over the period spanning from 1990 to 2021.

Figure (02) :GDP VS FDI in South Mediterranean countries during the period 1990-2020.



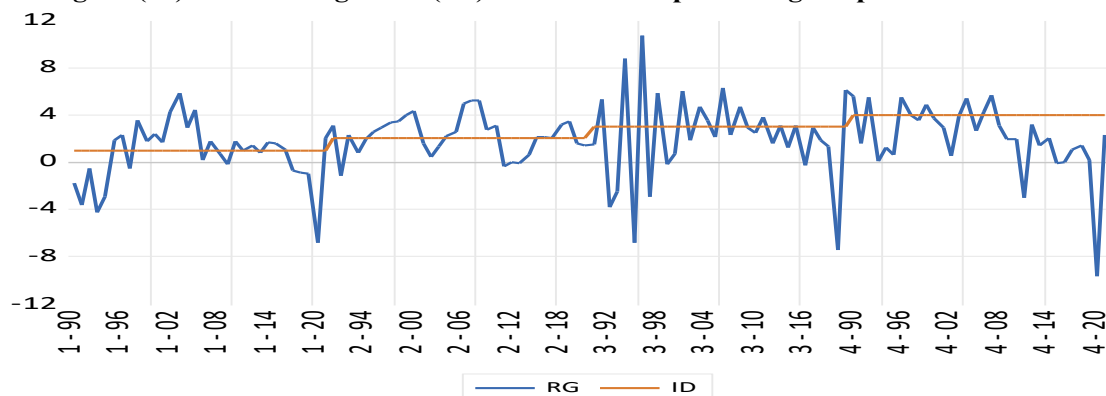
Source: prepared by the researcher based on Eviews12

The evolution of foreign direct investment (FDI) serves as a critical macroeconomic indicator, reflecting the stability and reduced costs associated with risk factors in a given economy. FDI levels are influenced by the availability of economic and investment security data, which shape foreign investors' confidence in committing resources. Among the South Mediterranean countries analyzed, Algeria exhibited a slight decline in FDI levels, with a reduction of 2%. In contrast, other countries in the region experienced significant recovery. Egypt and Tunisia achieved FDI growth rates of 10%, while Morocco recorded a rate of 7%. These variations highlight the differing capacities of these nations to attract foreign investments, underscoring the importance of stable policies and economic security in fostering a conducive environment for FDI.

4.4. Growth Rate Indicators of South Mediterranean Countries (1990–2021)

Growth rates measure the percentage change in specific economic variables over a defined period and are essential quantitative indicators for evaluating economic performance and investment potential. They provide critical insights into a country's economic health, helping investors assess potential returns and identify viable opportunities (Smith & Johnson, 2020). By offering a dynamic perspective on economic trends, growth rates facilitate a deeper understanding of investment environments and support strategic decision-making processes. These indicators are particularly valuable for assessing the vitality and profitability of investment prospects, making them integral to economic analysis and planning (Smith & Johnson, 2020).

Figure (03) : economic growth (Gr)rate in the sample during the period 1990-2020.



Source: prepared by the researcher based on Eviews12

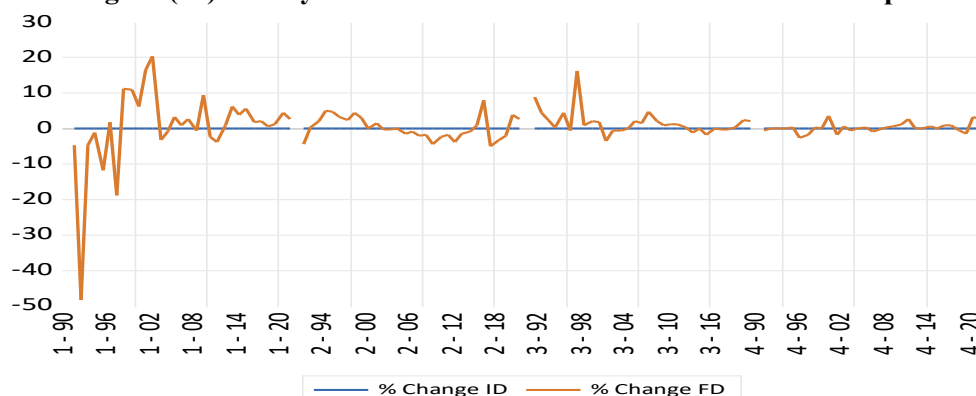
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Economic growth data charts for the study sample show significant alignment, particularly in the years 2019 to 2021. These years were marked by global lockdowns due to the COVID-19 pandemic, leading to a decline in growth rates across most sectors. However, what stands out is the similarity between Algeria and Egypt in their recorded growth rates, which did not exceed 4.5%. In contrast, Western countries experienced much higher growth rates, surpassing 11%. This period of growth continued until around 2010, when a downturn began. Tunisia, which relies less on revenue-based manufacturing industries, had growth rates that closely resembled Algeria and Egypt, with slight differences. This suggests a greater possibility for asset management and optimal control to ensure better returns. It should be noted that Tunisia experienced more severe declines due to heavy reliance on tourism and logistical services in its economy.

4.5.Domestic debt as a quantitative indicator of investment trends

Domestic debt serves as a quantitative measure reflecting the financial obligations undertaken by either the government or the private sector. Therefore, it is a significant indicator that explains government financing for various projects and programs, as it demonstrates significant susceptibility to the country's economic and financial decisions. With its crucial role and close connection to domestic investment, it serves as an important indicator of the government's ability to finance development projects within the country, especially if the government heavily relies on domestic or even foreign borrowing to fund its initiatives. Such dependence can lead to escalating debt levels, resulting in reduced liquidity and increased interest rates. This has been evident in Tunisia in recent years following the decline in tourism revenues due to the COVID-19 pandemic, in addition to other internal factors related to the political polarization and heightened risk levels.

Figure (04) : Analysis of Domestic Debt Conservation in the Sample



Source: prepared by the researcher based on Eviews12

The allocations for domestic investment in South Mediterranean countries, consistently below 2% of the total Gross Domestic Product (GDP), indicate a common trend in the region. Notably, Algeria witnessed a significant decline, dropping to less than 1% during the civil war in 1990. However, from 2000 to 2020, there was a notable increase in domestic debt allocations, reflecting the government's efforts to stabilize and rejuvenate the economic landscape.

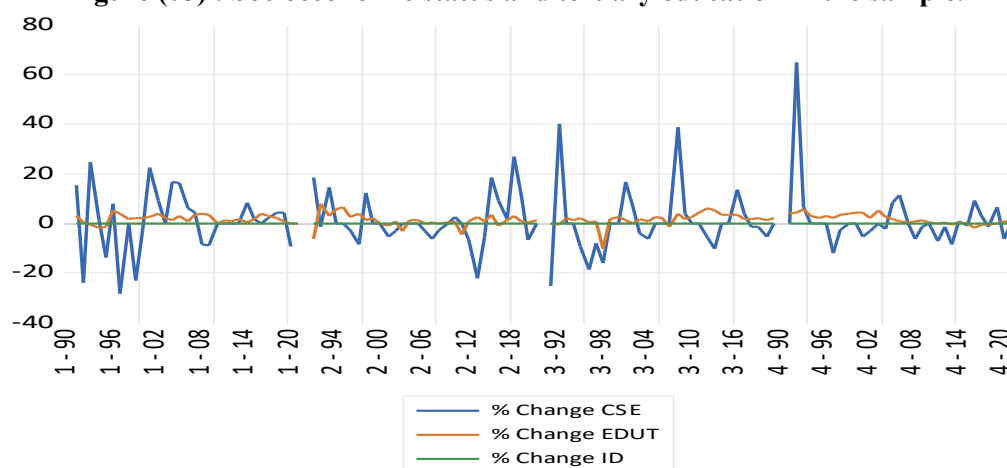
In contrast to the trajectory in Algeria, other nations in the region, such as Tunisia and Morocco, distinguish themselves with precise and organized management of internal debt

allocations. This strategic approach provides a clearer insight into how these countries navigate and balance their financial resources, showcasing a more consistent asset management strategy. The observed organizational structure in managing internal debt allocations in Tunisia and Morocco goes beyond mere financial administration; it becomes a vital driver for local economic development. The precision in resource allocation indicates a deliberate effort to stimulate and uplift local sectors, fostering a favorable environment for economic growth and sustainability. In general, this strategic allocation of domestic resources not only strengthens the financial foundation but also acts as a catalyst for enhancing indigenous industries, contributing to a more robust and resilient economic framework. We will need to link this data and its relationship to stimulating inbound investment through the partial diversity and nature of resources.

4.6. Socioeconomic Status and Tertiary Education

Social and Economic Conditions Index is widely recognized as a metric for assessing the social and economic well-being of a population. It encompasses various indicators, such as income, employment, education, illiteracy rates, school enrollment, housing- including housing types and accessibility, as well as essential amenities like healthcare coverage and its extent. These interconnected factors collectively constitute a comprehensive benchmark for evaluating the overall social and economic status of a population. Consequently, they can be utilized to guide resource allocation and identify areas of utmost importance.

Figure (05) : Socioeconomic status and tertiary education in the sample.



Source: prepared by the researcher based on Eviews12

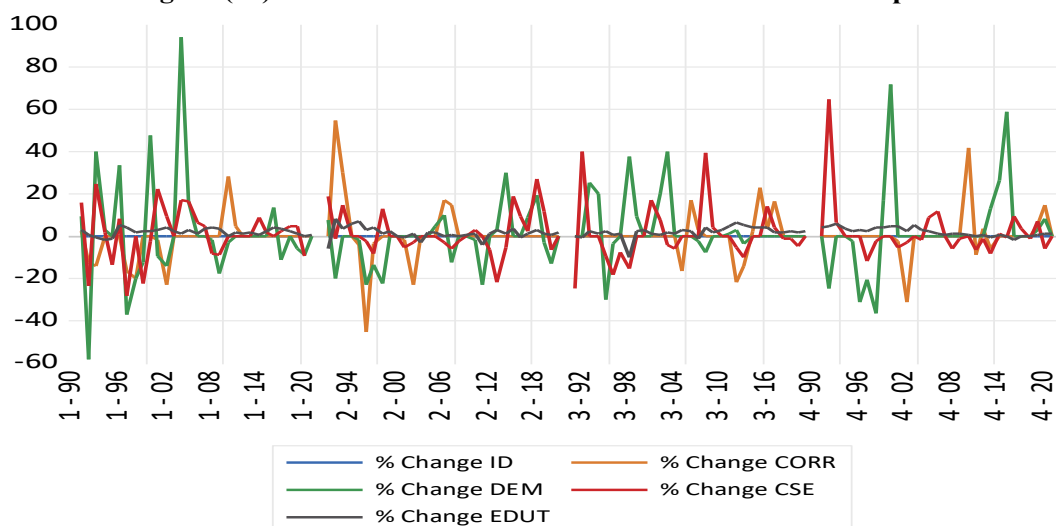
According to the recorded data, both Algeria and Egypt have a social and economic indicator that ranges between 3% and 6% as the minimum and maximum limit of the indicator. It is worth noting that the decline in the indicator level was associated with Algeria for the period from 1991 to 1996, which was the same period that witnessed social and political unrest in the country. However, after 1996, the indicator experienced a significant recovery, recording a four-degree increase from 2008 to 2020, reaching 6%, and maintaining it until 2021, the last year of the data analyzed. As for Egypt, the situation did not differ significantly, as the decline in the indicator was limited to 2012, after which it began to rise again. Moreover, Morocco and Tunisia showed a more positive situation based on the recorded indicator. They maintained relatively stable rates, with an increase of 7%, although it is important to note a decline in Tunisia in 2017-2018. Morocco stands out as the only country in the analysis with consistently positive and stable social and economic conditions.

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4.7..Democracy index evaluation and its impact on the other critical index

Evaluation of the Democracy Index and its Impact on Other Key Indices
The Democracy Index serves as a crucial qualitative measure, playing a significant role in informing foreign investors about a country's overall condition. This index encompasses various essential indicators, including the rule of law, fundamental rights, electoral processes, effectiveness of government and administration, civic participation, power distribution, and economic and social development. Additional factors such as press freedom, respect for human rights, and political freedoms are also taken into consideration. It is important to emphasize that these aspects directly influence the level of trust foreign investors place in a country. Given the cautious nature of capital, it is imperative for those responsible for legislation related to investment promotion to prioritize thorough preparation, utilizing the Democracy Index to instill confidence in foreign investors.

Figure (06) : Global levels of Socioeconomic index in the sample.



Source: prepared by the researcher based on Eviews12

Both Algeria and Morocco have come closer in terms of the democracy index, due to the similar nature of their geographic scope, in addition to the common features of the political circumstances, despite the significant differences in the foundations of the system for each of them. However, the situation was more severe for Algeria, where the fluctuation in the value of the index reached its peak between 1990 and 2000, which are the same years that are known as the “black decade”, referring to the bloody events that characterized the political scene following the ten-year civil war, which came as a result of the political polarization that began two years before that period, after the constitutional amendment of 1989, which theoretically allowed political practice and partisan pluralism in a country that was known before that period for its extreme closure and totalitarian tendencies. From 2008 to 2021, what we observe is a decline in the value of the index due to the convictions that have accumulated among the Algerian society about the futility of political practice under the weight of forgery that the ruling regime insisted on practicing, and other considerations related to the power of the army and the superficiality of the parties, in addition to the flimsy programs that they presented and their superficial vision. The scene was not very different for Morocco, where the events of Algeria cast their shadow over the Maghreb geography, creating political

polarization, but did not lead to bloody events like those witnessed in Algeria. As for Egypt, it seems, through the outputs, that the scene is darker, as the index did not exceed 40% except in 2012, which is the same year that witnessed the victory of a candidate who came as a real expression of the voice of the community. Finally, we note that the most positive distinction was for Tunisia, due to multiple considerations.

5. Panel Estimation model

In this section, we estimate the standard model that examines the relationship between GDP, as the dependent variable, and the explanatory variables, which serve as independent variables. The results are presented as follows:

5.1..Pooled effect model estimated

Under the assumption that the relationship between the dependent variable and the independent variables remains constant across all cross-sections, the following results are obtained from the pooled estimation model:

Table (02): Pooled effect estimated model

Dependent Variable: FDI				
Method: Panel Least Squares				
Date: 01/17/24 Time: 00:16				
Sample: 1990 2021				
Periods included: 32				
Cross-sections included: 4				
Total panel (unbalanced) observations: 127				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.110947	6.306348	-1.444726	0.1512
GDP	2.508531	1.919768	1.306684	0.1939
GR	0.104993	0.048292	2.174131	0.0317
DF	2.317150	0.745878	3.106608	0.0024
DP	0.124152	0.175314	0.708171	0.4803
EDUT	-0.482437	1.238336	-0.389584	0.6976
BUR	-0.886314	0.679092	-1.305146	0.1944
CORR	-0.233804	0.336927	-0.693931	0.4891
CSE	-0.010382	0.171513	-0.060529	0.9518
DEM	-0.140374	0.128439	-1.092923	0.2767
SG	0.214519	0.103673	2.069191	0.0407
R-squared	0.330936	Mean dependent var		2.086734
Adjusted R-squared	0.273258	S.D. dependent var		1.719116
S.E. of regression	1.465532	Akaike info criterion		3.684945
Sum squared resid	249.1429	Schwarz criterion		3.931292
Log likelihood	-222.9940	Hannan-Quinn criter.		3.785033
F-statistic	5.737650	Durbin-Watson stat		1.319718
Prob(F-statistic)	0.000001			

Source: prepared by the researcher based on Eviews12

The inclusion of Gross Domestic Product (GDP) as an independent variable through the pooled model, although not statistically reliable in this model, highlights its perceived impact on Foreign Direct Investment (FDI) flows. It is noted that the variable denoted as DF exhibits a statistically significant inverse relationship with FDI, as evidenced by its coefficient and associated probability value. This indicates that as DF increases, FDI tends to decrease, holding other factors constant. The overall model quality, while not explicitly detailed in the provided description, would typically be evaluated through R-squared (33%) and adjusted R-squared values (27%), both of which are crucial for assessing the proportion of variance in the dependent variable that can be predicted from the independent variables. As for the remaining variables, they did not prove significant; however, it is worth mentioning their negative coefficients, especially when related to administrative and financial corruption, democracy, and educational dynamics. The stability of governments (SG) variable in Mediterranean countries is an exception, showing significance within a coefficient of 21% and a p-value of 0.00407. These findings contribute to a broader understanding of the dynamics governing Foreign Direct Investment.

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5.2. fixed effect model estimated

Under the assumption of fixed effect model, which predicts that the relationship between variables for cross-sections is not constant across cross-sections, but also assumes its stability over time, which makes it Strang method can explaining the relationship between different variables included in the model. Under this hypothesis, we get the following output.

Table (03) : Fixed effect estimated model (fixed effect cross-section)

Dependent Variable: FDI					
Method: Panel Least Squares					
Date: 01/17/24 Time: 00:31					
Sample: 1990 2021					
Periods included: 32					
Cross-sections included: 4					
Total panel (unbalanced) observations: 127					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-2.180004	6.599819	-0.330313	0.7420	
GDP	0.858174	1.879324	0.456640	0.6491	
GR	0.097103	0.053266	1.822973	0.0718	
DF	2.517635	0.819856	3.070827	0.0029	
DP	0.071286	0.242237	0.294281	0.7693	
EDUT	-0.732925	1.385653	-0.528938	0.5982	
BUR	-0.550371	0.650047	-0.846663	0.3996	
CORR	-0.027781	0.353220	-0.078651	0.9375	
CSE	-0.438420	0.201133	-2.179751	0.0320	
DEM	-0.380232	0.137272	-2.769911	0.0069	
SG	0.324723	0.160632	2.021541	0.0464	
Effects Specification					
Period fixed (dummy variables)					
R-squared	0.635744	Mean dependent var	2.086734		
Adjusted R-squared	0.460044	S.D. dependent var	1.719116		
S.E. of regression	1.263236	Akaike info criterion	3.565111		
Sum squared resid	135.6400	Schwarz criterion	4.505709		
Log likelihood	-184.3846	Hannan-Quinn criter.	3.947265		
F-statistic	3.618347	Durbin-Watson stat	1.810413		
Prob(F-statistic)	0.000000				

Source: prepared by the researcher based on Eviews12

$$\begin{aligned}
 FDI = & -2.18000384289 + 0.858173583647*GDP + 0.0971026559029*GR + \\
 & 2.51763471106*DF + 0.0712858250313*DP - 0.732925028135*EDUT - \\
 & 0.550370504673*BUR - 0.0277809963681*CORR - 0.438419845725*CSE - \\
 & 0.380232088537*DEM + 0.324723368302*SG
 \end{aligned}$$

The fixed model indicates a strong relationship between the variables and Foreign Direct Investment (FDI), as shown by the high R-squared value of 0.635744, which suggests that about 63.57% of the variance in FDI is explained by the model's variables. This means that the positive coefficient for DF (2.517835) with a statistically significant p-value (0.0029) has a strong positive effect on FDI, indicating that an increase in DF is associated with an increase in FDI, all other factors being constant. On the other hand, variables such as GDP and EDUT, with negative coefficients, suggest an inverse relationship with FDI. At the overall level of model measurement, the outputs confirm the model's goodness of fit and the importance of the coefficients for the variables in explaining the dynamics of FDI. It can be said that the positive statistical significance of local investment DF to foreign investment explains the levels of integration found in investment management for countries in the southern Mediterranean, which will result in more missed opportunities and a more costly waste of

resources. This analysis provides valuable insights into the factors affecting FDI and highlights the necessity of empirical precision in economic research.

Table (04) : Fixed effect estimated model (fixed effect time)

Dependent Variable: FDI
Method: Panel Least Squares
Date: 03/24/24 Time: 04:00
Sample: 1990 2021
Periods included: 32
Cross-sections included: 4
Total panel (unbalanced) observations: 127

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.180004	6.599819	-0.330313	0.7420
GDP	0.858174	1.879324	0.456640	0.6491
GR	0.097103	0.053266	1.822973	0.0718
DF	2.517635	0.819856	3.070827	0.0029
DP	0.071286	0.242237	0.294281	0.7693
EDUT	-0.732925	1.385653	-0.528938	0.5982
BUR	-0.550371	0.650047	-0.846663	0.3996
CORR	-0.027781	0.353220	-0.078651	0.9375
CSE	-0.438420	0.201133	-2.179751	0.0320
DEM	-0.380232	0.137272	-2.769911	0.0069
SG	0.324723	0.160632	2.021541	0.0464
Effects Specification				
Period fixed (dummy variables)				
R-squared	0.635744	Mean dependent var	2.086734	
Adjusted R-squared	0.460044	S.D. dependent var	1.719116	
S.E. of regression	1.263236	Akaike info criterion	3.565111	
Sum squared resid	135.6400	Schwarz criterion	4.505709	
Log likelihood	-184.3846	Hannan-Quinn criter.	3.947265	
F-statistic	3.618347	Durbin-Watson stat	1.810413	
Prob(F-statistic)	0.000000			

Source: prepared by the researcher based on Eviews12

If the fixed effects model focuses on studying and analyzing the fixed differences in behaviors or individual characteristics within each unit, then the fixed time model focuses on analyzing the fixed differences in economic, political, or cultural conditions. Based on our findings of equivalence in both outputs (Fixed Cross-Section and Fixed Time models) in terms of the significance of the standard coefficients ($R_square = 63\%$, $Adjusted\ R_square = 46\%$), in addition to the Durbin-Watson coefficient ($DW = 1.8$), it provides the possibility to interpret the relationship between Foreign Direct Investment (FDI) and other independent variables, given the individual differences. This also provides the opportunity to interpret the relationship between types of variables, considering economic, political, or cultural conditions.

5.3 Random effect model estimated

Under the assumption of random-effect model, where the cross-sections are treated as a random variable. We get the following output.

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Table (05) : Random effect estimated model

Dependent Variable: FDI				
Method: Panel EGLS (Period random effects)				
Date: 01/17/24 Time: 00:27				
Sample: 1990 2021				
Periods included: 32				
Cross-sections included: 4				
Total panel (unbalanced) observations: 127				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.624864	5.561823	-1.370929	0.1730
GDP	2.114366	1.681678	1.257296	0.2112
GR	0.104797	0.044092	2.376794	0.0191
DF	2.288727	0.670904	3.411407	0.0009
DP	0.138055	0.163278	0.845525	0.3996
EDUT	-0.331863	1.105560	-0.300176	0.7646
BUR	-0.761655	0.597027	-1.275747	0.2046
CORR	-0.174786	0.301552	-0.579621	0.5633
CSE	-0.103688	0.155460	-0.666974	0.5061
DEM	-0.189624	0.114536	-1.655591	0.1005
SG	0.206604	0.097826	2.111962	0.0368
Effects Specification			S.D.	Rho
Period random			0.419810	0.0995
Idiosyncratic random			1.263236	0.9005
Weighted Statistics				
R-squared	0.332432	Mean dependent var	1.738997	
Adjusted R-squared	0.274883	S.D. dependent var	1.612272	
S.E. of regression	1.373407	Sum squared resid	218.8047	
F-statistic	5.776511	Durbin-Watson stat	1.382430	
Prob(F-statistic)	0.000001			
Unweighted Statistics				
R-squared	0.327655	Mean dependent var	2.086734	
Sum squared resid	250.3646	Durbin-Watson stat	1.322830	

Source: prepared by the researcher based on Eviews12

The random effects model was associated with conventional difficulties, the most noticeable of which was the presence of serial correlation in the mistakes, as revealed by the Durbin-Watson coefficient (DW = 1.3228). However, it had no overall effect on the model's fitness (P = 0.000001). In terms of total coefficient weights, the model explained R-squared = 32.32% and Adjusted R-squared = 27.32% of the variation in foreign direct investment. This closely mirrored the results of the aggregate effect model, demonstrating that both models' explanatory power had declined significantly. The presence of statistical significance for the association between FDI and three variables among the rest included in the model was interpreted, pertaining to the growth rate of per capita gross domestic production addition to the logarithm of domestic lending to the private sector as a percentage of GDP, as well as government stability.

5.4. The most appropriate model (Hausman_ test)

To select the best appropriate model for predicting the relationship between variables in fixed-effect and random-effect models, we utilize the Hausman test based on its hypotheses. The best appropriate model is chosen by comparing the P-value to its statistical significance threshold. If the P-value is greater than 5%, the statistical conclusion is to accept the null hypothesis and use the random-effect model. If the P-value is smaller than the significance level, the statistical decision is to reject the null hypothesis and accept the alternative

hypothesis that the fixed-effect model is suitable.

Table (06): Hausman test result

Correlated Random Effects - Hausman Test

Equation: Untitled

Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	31.137337	10	0.0006

Source: prepared by the researcher based on Eviews12

The results indicate a Chi-Square statistic of 31.137337 with 10 degrees of freedom and a p-value (Prob.) of 0.0006. This low p-value suggests that there is a statistically significant difference between the fixed effects and random effects models. Consequently, the null hypothesis—that the preferred model is random effects because the unique errors are uncorrelated with the regressors—is rejected. Therefore, the fixed effects model is more appropriate for the data.

6. The most appropriate model

The most representative model (fixed-effect model) for the cross-sectional relationship between foreign investment FDI as a predicted variable, including the explaining independent variables, is the specific indicator.

Table (07): Specific criteria's of fixed effect model

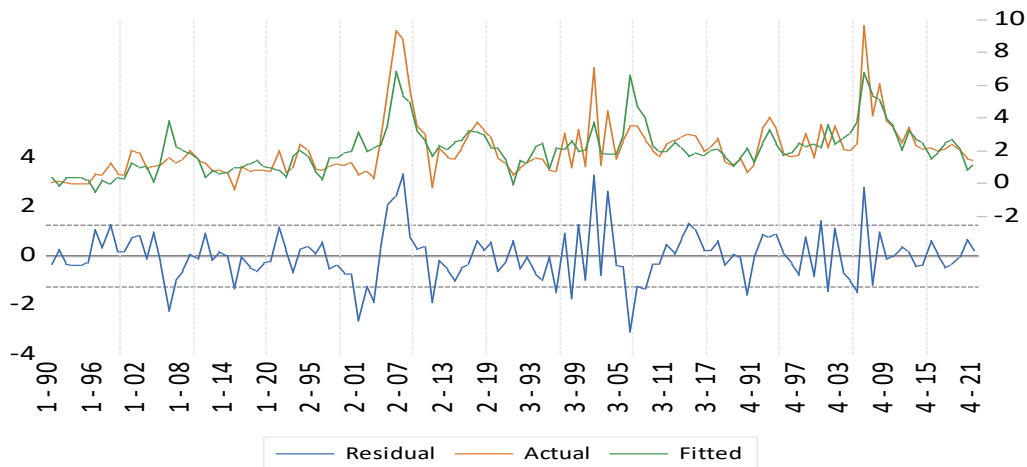
Effects Specification			
Period fixed (dummy variables)			
R-squared	0.635744	Mean dependent var	2.086734
Adjusted R-squared	0.460044	S.D. dependent var	1.719116
S.E. of regression	1.263236	Akaike info criterion	3.565111
Sum squared resid	135.6400	Schwarz criterion	4.505709
Log likelihood	-184.3846	Hannan-Quinn criter.	3.947265
F-statistic	3.618347	Durbin-Watson stat	1.810413
Prob(F-statistic)	0.000000		

Source: prepared by the researcher based on Eviews12

The effects specification table elucidates that the model elucidates 63.57% of the variance in the dependent variable, as indicated by an R-squared value of 0.635744. The Adjusted R-squared, at 0.460044, adjusts for the number of predictors and explicates approximately 46% of the variance. The standard error of regression, 1.263236, estimates the residuals' standard deviation, while the sum of squared residuals, 135.6400, aggregates the squared discrepancies between observed and predicted values. The model's statistical significance is affirmed by an F-statistic of 3.618347 and a negligible p-value, suggesting the model's collective predictors are significantly associated with the dependent variable. The Durbin-Watson statistic of 1.810413 indicates no substantial autocorrelation, corroborating the model's suitability for the data analysis. These results substantiate the fixed effects model's application, reinforced by its statistical significance and explanatory capacity.

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Figure (07) :Actual vs fitted models estimated



Source: prepared by the researcher based on Eviews12

The trends of the original and estimated data series show convergence in their overall trend, as evidenced by the residuals exhibiting significant convergence except at some points outside the confidence bounds. This provides a strong explanation for the adequacy of the estimated model for the fixed effect among the various cross-sectional dimensions included in the model.

▪ Confidence interval of the coefficient

The confidence interval table highlights the ability to provide a range of values within which we can be confident that the true parameter value resides. It indicates the accuracy of the fixed effects model in estimating the relationship between foreign investment and other macroeconomic indicators for countries in the South Mediterranean region. This assists us in assessing the reliability and uncertainty associated with our findings.

Table (08): Confidence interval of fixed effect model

Coefficient Confidence Intervals
Date: 03/24/24 Time: 05:27
Sample: 1990 2021
Included observations: 127

Variable	Coefficient	95% CI	
		Low	High
C	-2.180004	-15.30221	10.94220
GDP	0.858174	-2.878426	4.594773
GR	0.097103	-0.008805	0.203010
DF	2.517635	0.887542	4.147727
DP	0.071286	-0.410347	0.552918
EDUT	-0.732925	-3.487975	2.022125
BUR	-0.550371	-1.842838	0.742097
CORR	-0.027781	-0.730077	0.674515
CSE	-0.438420	-0.838326	-0.038514
DEM	-0.380232	-0.653166	-0.107298
SG	0.324723	0.005345	0.644102

Source: prepared by the researcher based on Eviews12

Confidence intervals for the coefficients of a set of variables are fundamental in determining the accuracy of the estimated coefficients. A 95% confidence interval suggests that there is a 95% probability that the true value of the coefficient lies within the specified range, reflecting

a closeness between the current data and the estimated data model. This provides a robust statistical basis and serves as evidence of the credibility of the results, facilitating decision-making based on the estimated range of values. It also explains the relationship between foreign investment while taking into account the fixed individual variance for each country, i.e., controlling for the constant characteristics of each country individually.

6. Conclusion:

Foreign investment is often regarded as a cornerstone for fostering social and economic development, enhancing internal economic diversification, and broadening the scope of contributors and partners. Its strategic promotion among Mediterranean countries is vital for creating and sustaining growth opportunities. This study examines the interactive relationship between foreign investment in South Mediterranean countries through a standardized and comparative approach. Rather than relying solely on traditional macroeconomic indicators, the analysis highlights the influence of factors such as governmental stability, administrative efficiency, workforce qualifications, educational standards, democracy, social and economic conditions, and efforts to combat corruption, bureaucracy, and property rights violations.

To predict the relationship between these variables and foreign investment, the Hausman test was employed, identifying the fixed effects model as the most suitable framework. This model explained 63.57% of the variability in foreign investment, with statistical significance confirmed by an F-statistic of 3.618347, although the p-value was deemed insignificant.

The study further explored challenges impeding foreign investment in Mediterranean countries, emphasizing disparities in resource allocation and unequal opportunities. Algeria, for instance, attracts less than 5% of foreign investments outside the energy sector. The post-2015 decline in foreign investment inflows, exacerbated by the departure of Orascom Telecom and administrative inefficiencies, has tarnished Algeria's global investment reputation. These findings underscore the urgent need for a reassessment of investment policies across South Mediterranean countries, advocating for a collaborative framework akin to the European Union and other regional organizations.

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