

The FDI as a Strategic Driver of Export Diversification in Algeria *an empirical Evidence (1995–2022).*

Merniz Nour el houla ⁽¹⁾, Chikha Leila ⁽²⁾

¹ **PhD student**, Department of Economics, Business and Management Sciences, Maghreb Economic Studies Laboratory, University of Batna 1, Algeria, nourelhouda.merniz@univ-batna.dz

² **Professor**, Department of Economics, Business and Management Sciences, Maghreb Economic Studies Laboratory, University of Batna 1, Algeria, leila.chikha@univ-batna.dz

ARTICLE INFORMATION

Original Research Paper

Received: 01/ 07 /2025

Accepted: 23/ 08 /2025

Published: 21/ 09 /2025

Keywords:

Keyword.1: Export diversification

Keyword.2: FDI

Keyword.3: Trade Openness

Keyword.4: Real effective exchange

Keyword.5: Natural resource Curse

JEL Classification F14, F21, F13, F31, Q13

Abstract:

This study investigates the role and impact of FOREIGN Direct Investment (FDI) in Algeria export diversification from 1995-2022. Using annual data and applying a combination of advanced econometric include a Time-Variant Coefficient Model (TVCM), dominance analysis and Relative importance. This study evaluates the relative impact of FDI alongside with trade openness, real effective exchange rate and oil export ration defined as the naturel resource curse. The results found that FDI is the most significant determinant of export diversification, contributing over 56% of the explained variance in the dominance analysis. Trade openness showed secondary importance, while the real exchange rate and oil export ratio had limited effect. These finding highlight the important role of FDI in transforming Algeria's export structure due to the important implications for economic policy. Targeted strategies to attract and optimize FDI especially in non hydrocarbon sectors which serve as a powerful tool in reducing export concentration, promote economic resilience, and make Algeria's trade patterns in line with global market demand.

Mots clés:

Mot clé.1: Diversification des exportations

Mot clé.2: IDE

Mot clé.3: Ouverture commerciale

Mot clé.4: Taux de change effectif réel

Mot clé.5: Malédiction des ressources naturelles

Codes de classification

JEL: F14, F21, F13, F31, Q13

Abstract:

Cette étude examine le rôle et l'impact des investissements directs étrangers (IDE) sur la diversification des exportations algériennes de 1995 à 2022. À l'aide de données annuelles et d'une combinaison de techniques économétriques, notamment un modèle à coefficients variables dans le temps (TVCM), une analyse de dominance et Importance relative, cette étude évalue l'impact relatif des IDE, ainsi que l'ouverture commerciale, le taux de change effectif réel et le ratio d'exportation de pétrole, défini comme la malédiction des ressources naturelles. Les résultats montrent que les IDE constituent le déterminant le plus important de la diversification des exportations, contribuant à plus de 56 % de la variance expliquée dans l'analyse de dominance. L'ouverture commerciale a joué un rôle secondaire, tandis que le taux de change réel et le ratio d'exportation de pétrole ont eu un effet limité. Ces résultats soulignent le rôle important des IDE dans la transformation de la structure des exportations algériennes, en raison de leurs implications importantes pour la politique économique. Des stratégies ciblées pour attirer et optimiser les IDE, en particulier dans les secteurs hors hydrocarbures, constituent un outil puissant pour réduire la concentration des exportations, promouvoir la résilience économique et adapter la structure des échanges commerciaux de l'Algérie à la demande du marché mondial.

Corresponding Author: **MERNIZ Nour el houla**

Email: nourelhoula.merniz@univ-batna.dz

1- Introduction

Like many other developing countries, Algeria has realized how crucial export diversification is to boost its potential for economic growth and resilience. This approach entails exploring new markets and product categories in addition to increasing the production and export quantities of current products. However, compared to other regions like East Asia and Eastern Europe, Algeria has implemented comparatively few trade reforms, which has retarded its success in this area.

The export structure of the country has presented difficulties, as Algeria and other MENA nations have found it difficult to match their product orientation with the demands of the world market. Their potential for export growth has been retarded by this mismatch, especially in the 1990s. Algeria must strengthen its interaction with the international market in order to overcome these problems and further its economic development. One of the most important instruments for accomplishing this goal is Foreign direct investment (FDI), which has the potential to increase national output and productivity while simultaneously encouraging local investment and facilitating technology transfer. In general, FDI has the potential to significantly increase Algeria's export diversification through direct entry into non traditional industries or indirect proportion of traditional export with the lowest proportion.

Numerous studies have explored the impact of Foreign Direct Investment (FDI) on export diversification, revealing diverse conclusions. across various regions and countries, In (MENA), (dalila Nicet Chenaf, 2008) aim to measure the effects of export diversification on growth in the Middle East and North Africa (MENA) countries by using an endogenous growth model estimated by the GMM system method. They provide robust evidence that FDI does not necessarily have the same effect on growth according to the diversification level. They also show that while FDI has a positive and significant effect on the MENA countries growth, it is most likely rather linked to the direct effect on value added Which means that FDI has a positive effect on production and employment than to the spillover effects of technological transfer. (Bedassa Tadesse, 2011) expanded this understanding by illustrating that an increase in FDI generally enhances the horizontal diversification of exports, but the effect is not uniform and varies across countries.

In the other hand, In Nigeria (D. F. Arawomo, 2014) revealed contrasting finding, indicating that FDI discourages diversification, whereas domestic

investment promotes it. this regional disparity was emphasized Studying the ASEAN and SAARC countries (SHABANA NOUREEN, 2016) and in Sub-Saharan Africa (Gamariel, 2022) demonstrating the various effects of FDI on the mix of exports in various economic contexts.

Furthermore, studies conducted on specific countries, such as Algeria. (Boukolia, 2022), (Rarek, 2019), (Keddari, 2022)

Where Rarek's work in 2019 aims to measure the impact of Foreign Direct Investment (FDI) on Algeria's economic growth from 1980-2017 using Autoregressive Distributed Lags (ARDL), results show FDI's short-term contribution is 0.03 and long-term contribution 0.07, which is confirmed by the theoretical relationship between them, indicating a positive impact. **Conversely, Mohamed Boukolia's study** examines Algeria's foreign direct investment impact on trade balance from 2003-2018 using the ARDL model. **It focuses on the necessity of diversifying exports, particularly beyond the oil sector, and discusses the complicated effects of foreign direct investment on the trade balance.**

The study concluded that foreign direct investment, gross domestic product and exchange rate have a positive impact on trade balance Which implies a positive impact on exports, and that economic openness has a negative impact on trade balance. Findings suggest that economic openness negatively affects trade balance. **Furthermore (Keddari, 2022) research** examines Algeria's export diversification from 1995 to 2020, finding a negative correlation between export diversification and GDP growth and investment flexibility, encouraging trade specialization while Short-term findings highlighted GDP growth and investment flexibility as significant drivers of export diversification

Any country can benefit from foreign direct investment (FDI), but the methods for attracting FDI vary depending on the openness of the economy, regulations, and other factors. In light of these intense competitions to see who can draw in the most FDI, let's examine Algeria's position in this regard and how it may affect its export diversification.

diversifying a country 's exports is highly advantageous as it fosters economic expansion, consistent earnings from exports, employment generation, poverty alleviation, and the establishment of new infrastructure and skills that facilitate the development of new export products. These can be generated through the nation's potential or by drawing in foreign direct investment.

2- Research Methods, tools and measures

This study looks into the determinants of export diversification in Algeria and which one it effects it more from 1995 to 2022, using yearly data. The dependent variable (export diversification), is measured with the Herfindahl index. The main independent variables we study are Foreign Direct Investment (FDI), real exchange rate, trade openness, and fuel which is total oil exports to total exports (resource curse). These variables were chosen because they are important for exports diversification in economies that depend on naturel resources like Algeria.

Most studies (Bouklia, 2022) (Keddari, 2022) (Mekuriaw, 2021) (Bedassa Tadesse,, 2011) (D. F. Arawomo, 2014) have agreed that the factors determining export diversification are as follows:

Export diversification: we measured it using the Herfindahl–Hirschman Index (HHI) for products, which measures the degree of product concentration. It has been standardized to yield values ranging from 0 to 1, according to the following formula: (UNCTAD, 2025)

$$H_j = \frac{\sqrt{\sum_{i=1}^n \left(\frac{x_{ij}}{X_j} \right)^2} - \sqrt{1/n}}{1 - \sqrt{1/n}}$$

H_j= index of the country or group of countries

X_{ij}= export value of Product *i* from country *j*

n = number of products.

Explanation of the index: a value of the index close to 1 indicates that a country's exports or imports are highly concentrated in a limited number of products. Conversely, values close to 0 reflect a more even distribution of shares across products.

FDI: represents the Foreign Direct Investments as the net cash flow. (Bank of Algeria , 2025)Thanks to spillovers effects FDI can be an engine of export diversification. Thus, the sign expected of this variable is negative.

OPEN: represents economic openness. This indicator reflects the relative importance of foreign trade (total exports and merchandise imports) related to the gross local product. It also represents the degree of exposure and connection with the outer world it is approximated by the sum of merchandise exports and imports divided by the value of GDP.

REER_t = Real Effective Exchange Rate at time t, which is the number of units of foreign goods needed to purchase one unit of domestic goods, meaning that the exchange rate is a real concept that measures the relative prices of two goods.

FUEL is the fuel exports to total exports ratio. (SHABANA NOUREEN, ZAFAR MAHMOOD, 2016) they determine fuel export to total exports ratio a proxy for natural resource curse.

We collected data from the World Bank's (World Bank Group, 2025) World Development indicators (World Development Indicators (WDI), 2025) and Algeria's National Office of Statistics (National Office of statistics, 2025), and the analysis was conducted using both Stata and Python.

To understand how these variables effects export diversification, we used several econometric methods such as: Time Variant Coefficient model (TVCM); Dominance Analysis; Relative Importance.

First, a Time Varying Coefficient (TVC) model was estimated using local linear regression to capture how the influence of each predictor evolved over time (Cai, 2000)

This model provides a flexible alternative to standard linear regression by allowing coefficients to change across the 1995-2022 period, thus accounting for policy shifts, globalization effects, and structural transitions.

Second, Dominance Analysis and Relative Importance Analysis were used to assess the contribution of each variable to the explained variance in export diversification.

Dominance analysis identifies which variables consistently contribute most across all subset models (Azen, 2003) while **relative importance** (Johnson, 2000) decomposes R^2 into unique and shared components to assess both independent and overlapping influence.

3- Results

Based on the descriptive analyses we conducted the following:

The table shows economic indicators for 28 observations from 1995 to 2022, including oil export share (mean = 0.962, SD = 0.026), trade openness

(mean = 0.000239, SD = 0.000218), real exchange rate (mean = 84.47, SD = 25.20), FDI (mean = 1.15 billion, SD = 837 million), and export diversification (mean = 0.799, SD = 0.036). While FDI is rather variable, export diversification and oil exports exhibit little fluctuation. According to skewness results, FDI (0.12), trade openness (3.98), and exchange rate (0.87) are positively skewed, but EXPORT_DIV (−0.70) and EXPOILTOTAL (−1.59) are adversely skewed. Strong outliers are shown by the exceptionally high kurtosis (19.64) for trade openness. The Jarque-Bera test indicates that the exchange rate ($p = 0.16$), FDI ($p =$ distributed. However, there are outliers or structural anomalies present because trade openness ($p = 0.0000$) and oil exports ($p = 0.0002$) significantly vary from normalcy. 0.82), and EXPORT_DIV ($p = 0.32$) are roughly normally.

Based on all the methods mentioned above we conducted these results:

3-1- Unit Root Test:

using standard and bootstrap unit-root diagnostics Augmented Dickey Fuller (ADF), Phillips Perron (PP), KPSS (level stationarity), and Autoregressive Wild Bootstrap (AWB) ADF under trend/intercept/none we assess stationarity for FDI, trade openness, the real exchange rate, and a resource-curse ratio at levels and differences. For FDI, level tests fail to reject a unit root (ADF $p=0.829$; PP $p=0.544$), while KPSS does not reject level stationarity ($p=0.10$) and AWB ADF also fails across deterministic, so we treat levels as non-stationary overall t the first difference, evidence is mixed—ADF still fails ($p=0.365$) but PP rejects ($p=0.01$) and KPSS supports stationarity ($p=0.10$); AWB ADF rejects only without deterministic and is borderline with an intercept At the second difference, all tests indicate stationarity (ADF $p=0.018$; PP $p=0.01$; KPSS $p=0.10$; AWB $p \approx 0-0.019$) $\Rightarrow$ I(2) trade openness is stationary already in levels: ADF ($p=0.035$), PP ($p=0.01$), KPSS ($p=0.10$) and AWB ADF ($p \leq 0.001$) all support stationarity; differencing preserves it, with similarly strong rejections at 1st and 2nd differences For the real exchange rate, levels clearly exhibit a unit root (ADF $p=0.902$; PP $p=0.976$), KPSS rejects level stationarity ($p=0.01$), and AWB ADF fails ($p = 0.83 - 0.97$) first differences remain mixed (ADF $p=0.613$ vs. PP $p=0.034$; AWB $p > 0.3$), while second differences are stationary by PP/KPSS and AWB, with ADF borderline ($p=0.069$) $\Rightarrow$ I(2) Finally, the resource-curse ratio is non-stationary in levels (ADF $p=0.99$; PP $p=0.943$; AWB ADF fails), becomes largely stationary after first differencing (ADF $p=0.025$; PP $p=0.01$; KPSS = 0.053), though bootstrap ADF rejects only with a trend, and is clearly stationary at the

second difference (PP/KPSS pass; AWB $p \leq 0.004$) $\Rightarrow$ overall I(1) with some mixed bootstrap evidence.

Table No1: summary for unit root test

Variable	Level Stationarity	1st Difference Stationarity	2nd Difference Stationarity	Order of Integration
FDI	Non-stationary : ADF ($p=0.8293$), PP ($p=0.5437$), KPSS ($p=0.1$)	Partially Stationary: ADF ($p=0.3645$), PP ($p=0.01$), KPSS ($p=0.1$)	Stationary: ADF ($p=0.0176$), PP ($p=0.01$), KPSS ($p=0.1$)	I(2)
Trade Openness	Stationary : ADF ($p=0.0351$), PP ($p=0.01$), KPSS ($p=0.1$)	Stationary: ADF & PP ($p=0.01$), KPSS ($p=0.1$)	Stationary: ADF & PP ($p=0.01$), KPSS ($p=0.1$)	I(0)
Real Exchange Rate	Non-stationary : ADF ($p=0.9021$), PP ($p=0.9757$), KPSS ($p=0.01$)	Partially Stationary : ADF ($p=0.6126$), PP ($p=0.034$), KPSS ($p=0.1$)	Stationary : ADF ($p=0.0689$), PP ($p=0.01$), KPSS ($p=0.1$)	I(2)
Resource Curse Ratio (Oil/Total Exports)	Non-stationary: ADF ($p=0.99$), PP ($p=0.9427$), KPSS ($p=0.0665$)	Partially Stationary: ADF ($p=0.0251$), PP ($p=0.01$), KPSS ($p=0.0525$)	Stationary: ADF ($p=0.0638$), PP ($p=0.01$), KPSS ($p=0.1$)	I(2)

3-2- Time variant coefficient model (TVCM)

the TVC model shows that the effect of FDI on export diversification increased steadily over time, with coefficients ranging from $-2.71e-11$ to

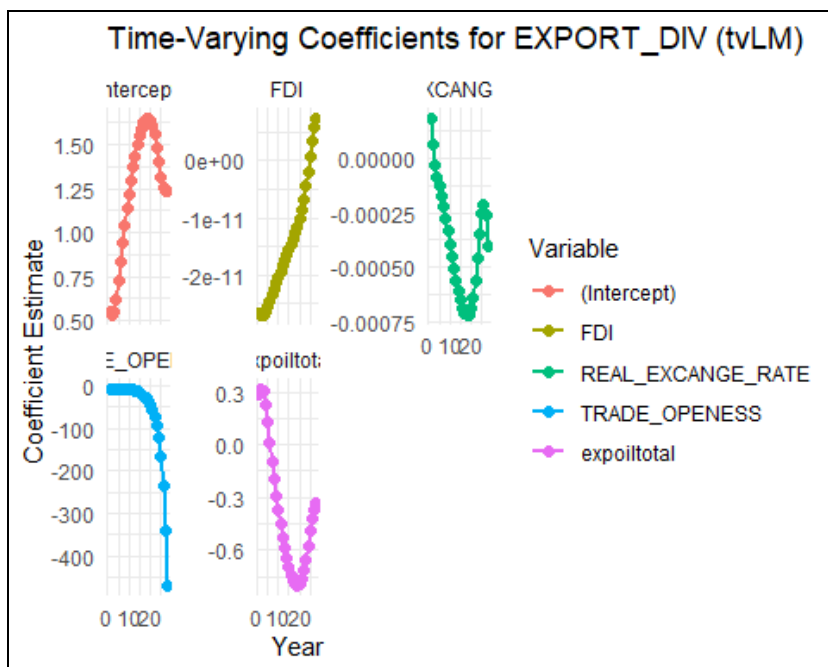
7.50e-12, confirming its growing. In contrast trade Openness, however, had consistently large negative coefficients (min: -470.89, mean: -65.02), reflecting a non-linear or complex relation. Fuel also showed a generally negative effect (mean: -0.3868), while Real Exchange Rate had a weak, erratic effect (mean: -0.0003871).from all of that we can see clearly that **FDI** emerges as the most robust and reliable driver of export diversification. It not only contributes the most unique variance ($sr^2 = 0.08$) but also aligns most strongly with the model's predictions ($sc = -0.87$). Model fit was satisfactory (Pseudo $R^2 = 0.5246$), indicating a solid explanatory model.

Table No 2. Time Varying coefficient for Export Diversification using local linear regression

Time varying coefficient model				
	Summary of time-varying estimated coefficients			
Intercept	FDI	REAL_EXCHANGE_RATE	TRADE_OPENESS	exploitotal
Min.	0.5283	-2.706e-11	-470.899	-0.8049
1st Qu.	1.0200	-2.263e-11	-58.960	-0.7037
Median	1.3095	-1.609e-11	-13.396	-0.4727
Mean	1.2346	-1.423e-11	-65.016	-0.3868
3 rd Qu.	1.5502	-8.109e-12	-7.297	-0.1732
Max	1.6531	7.496e-12	-6.010	0.3194
Bandwidth	0.8593			
Pseudo R-Squared	0.5246			

Source: Author's computation using TVC based on dataset covering 1995-2022

Figure No 1. graphs of Time Varying coefficient for Export Diversification using local linear regression



Source: Author's computation using TVC based on dataset covering 1995-2022

3-3- DOMINANCE ANALYSIS

In order to measure the relative contribution of each variable to the explanation of diversification of exports, a general dominance analysis was conducted (Figure 3) with linear regression. The model reported a combined explanatory power of $R^2 = 0.2813$, where the selected predictors explained approximately 28% variance in export diversification.

The analysis reveals that FDI is the most influential predictor of export diversification in the model. It has the highest general dominance 0.1584, contributing approximately 56.31% of the total explained variance $R=0.2813$. This suggests that across all the possible subset models, FDI consistently provides the most explanatory power. The second most important variable is expoil total (resource curse) contributing 23.6 to the model's explanatory power. Real exchange rate follows in the third position with a 16.54% contribution, while trade openness is the least dominant variable with 3.55% contribution of the variance explained. These results indicate that policies targeting FDI may have the substantial impact on promoting export diversification, whereas trade openness appears to have minimal independent influence.

Table No 1. General dominance statistics showing variable contributions to explained variance in EXPORT_DIV.

General dominance statistics: Linear regression			
Number of obs	=		28
Overall Fit Statistic	=		0.2813
EXPORT_DIV	Dominance Stat.	Standardized Domin. Stat.	Ranking
FDI	0.1584	0.5631	1
REAL_EXC~E	0.0465	0.1654	3
TRADE_OP~S	0.0100	0.0355	4
expoiltot~l	0.0664	0.2360	2
Conditional dominance statistics			

Source: Author's computation using Dominance Analysis in Python

3-4- Relative Importance Analyses

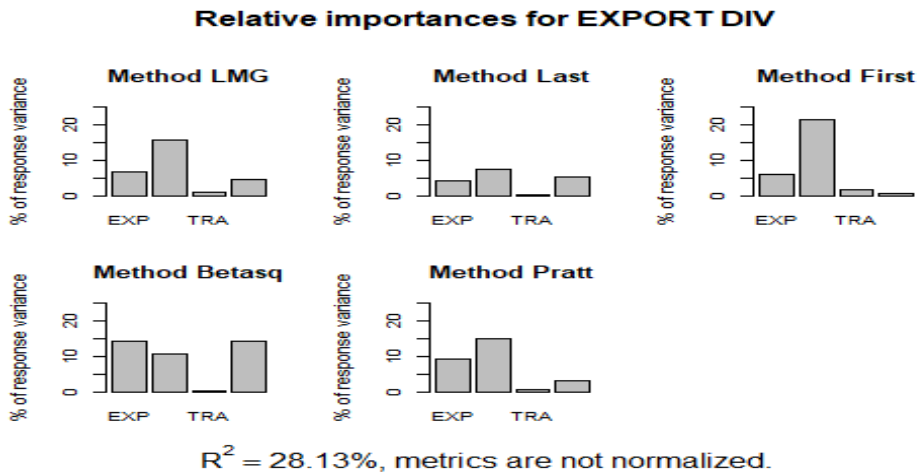
To assess the individual contribution of each predictor to export diversification, relative importance analysis was conducted using standardized coefficients (figure 4), semipartial squared correlations, level coefficients, and structure coefficients. The results clearly shows that foreign direct investment (FDI) is the most contributing factor. It only explains 8% of the variance in export diversification ($sr^2 = 0.08$) with a standardized coefficient of -0.33 and a structure coefficient of -0.87 , indicating a strong and direct impact on the predicted outcome. It is followed by real exchange rate with a semipartial R^2 of 0.05 and a standardized coefficient of -0.38 , though its structure coefficient is smaller (-0.15), indicating a moderate unique and structural effect. Expoiltotal (total exports) contributes 4% of unique variance ($sr^2 = 0.04$), and has a relatively strong structure coefficient (-0.46), which is well in accordance with the model's predictions despite its negative effect ($\beta = -0.38$). For comparison, trade openness contributes nothing unique ($sr^2 = 0.00$), has a very tiny standardized coefficient (-0.05), and little structural relevance (-0.25). These results affirm the predominance of FDI as the most relatively important predictor of export diversification, with openness to trade having minimal independent explanatory power after accounting for other macroeconomic controls.

Table No 2. Standardized and unstandardized regression coefficients with semipartial and structure contributions.

Coefficients for regression models					
Predictor	Unstandardised coefficients (b)	Standardised coefficients (beta)	Semipartial corr squared (sr2)	Level coefficients (lc)	Structure coefficients (sc)
FDI	-0.00	-0.33	0.08	-0.02	-0.87
REAL_EXCAN~E	-0.00	-0.38	0.05	-0.05	-0.15
TRADE_OPEN~S	-8.60	-0.05	0.00	-0.00	-0.25
expoiltotal	-0.53	-0.38	0.04	-0.51	-0.46

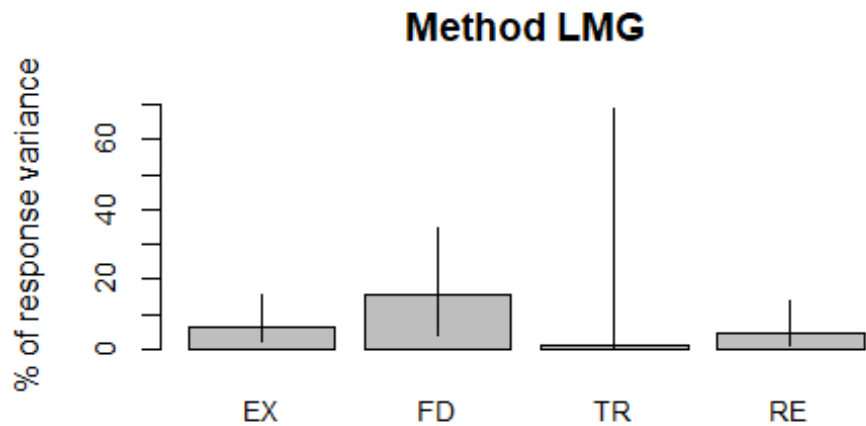
Source: Author's computation using linear regression model in Python (stats models)

We also found that the linear model explains a modest share of variation in EXPORT DIV ($R^2 = 28.13\%$). Across five relative-importance methods (LMG, Pratt, β^2 , First, Last), the ranking is consistent: **FDI** is the dominant determinant, accounting for the largest share of explained variance ($\approx 55\text{--}60\%$ under LMG), **EXPOIL/totalexp** is second (25–30%), the **real exchange rate** contributes a smaller but non-trivial portion (15–20%), and **trade openness** is effectively nil. LMG bootstrap results with 90% confidence intervals reinforce this pattern FDI and EXPOIL/totalexp have clearly positive contributions, the exchange rate is positive but imprecisely estimated, and trade openness is centered near zero with intervals spanning zero. The stability of the ranking across metrics reflects known differences in how R^2 is partitioned averaging sequential sums of squares for LMG, covariance-based apportioning for Pratt, squared standardized coefficients for β^2 , and order-specific decompositions for First/Last.



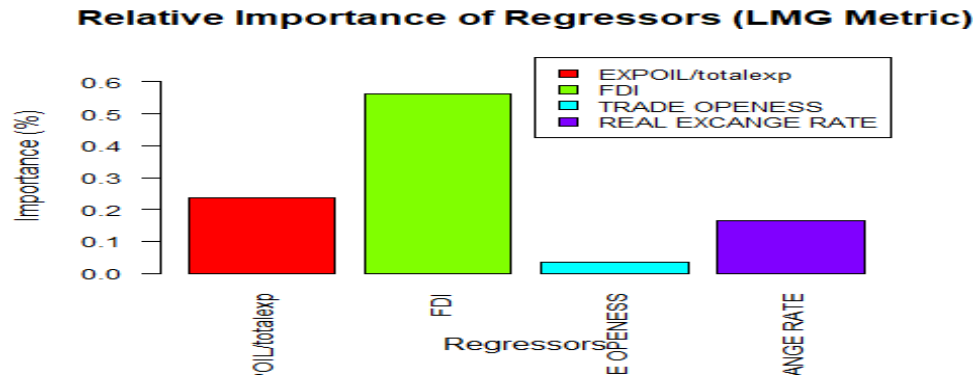
Source : Author’s calculations from the study dataset; bars sum to $R^2=28.13\%$

Relative importances for EXPORT DIV
with 90% bootstrap confidence intervals

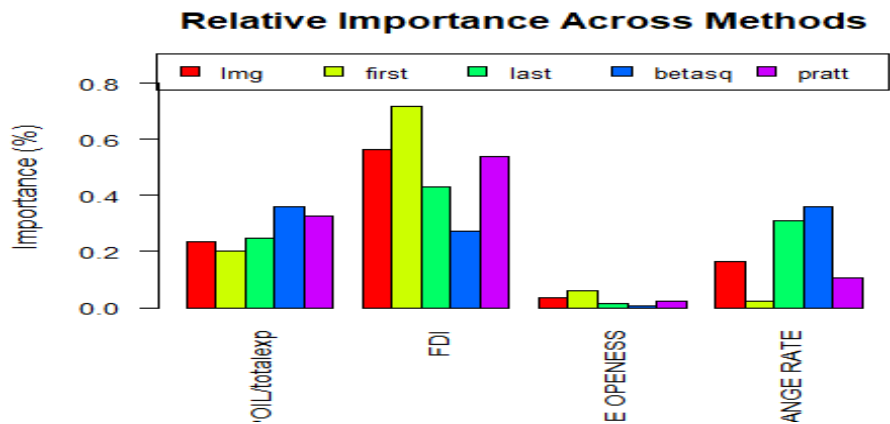


$R^2 = 28.13\%$, metrics are not normalized.

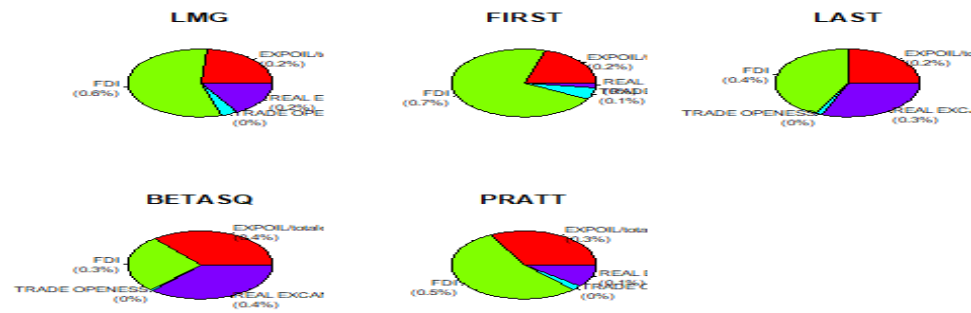
Source : Author’s bootstrap estimates computed from the study dataset using R



Source : Author’s calculations from the study dataset using OLS and relative-importance decomposition (LMG) in R.



Source: Author’s calculations from the study dataset using OLS and multiple importance metrics in R



4- Discussion:

This study explored the determinants of export diversification in Algeria in the period of 1995-2022. Using a combination of advanced econometric methods. The study found that FDI is the most influential determinant in explaining variation in export diversification, which is reinforced by dominance analysis, where it contributed 56.31% of the total explained variance ($R^2=0.2813$), and by dominance analysis FDI scored the highest dominance static (0.1584). these finding suggest that attracting FDI inflows can significantly influence Algeria’s export base.

The consistent dominance of FDI across models suggests that it plays a structurally transformative role in Algeria’s trade pattern. FDI enhance diversification not only by increasing capacity but also by introducing new products, technologies, and managerial practices into the domestic market. In contrast, trade openness seen as beneficial by displaying minimal independent influence close to 3.55% dominance share which indicates that

liberalization efforts alone are insufficient without complementary factors like investment climate and infrastructure.

These results are in line with studies by (Bedassa Tadesse,, 2011) and (SHABANA NOUREEN, 2016), who noted the role of FDI in supporting horizontal export diversification. However regional disparities exist, as shown by (D. F. Arawomo, 2014) in Nigeria where FDI has a discouraging effect on diversification. within Algeria our finding support (Boukha, 2022) and (Rarek, 2019)who demonstrated positive effect of FDI impacts on trade balance and economic growth. While (Keddari, 2022)’s observation of a negative correlation between diversification and GDP growth may reflect Algeria’s dependency on oil sector, which restrict its benefit from the diversification potential of FDI.

Future work should investigate the sector specific impact of FDI to determine which industries drive diversification. Moreover, comparative studies across MENA or other resource dependent economies could better contextualize Algeria’s adopted strategy.

5- Conclusion

This study investigated the effects of macroeconomic determinant especially putting the light on FDI on export diversification over the 1995-2022 period.

Across all the analytical methods, FDI emerged as the most critical determinant of export diversification. Dominance analysis revealed that FDI explains more than 50% of the observed variation in the model. Trade openness, while beneficial played a secondary role while the real exchange rate and oil export ratio had more limited and inconsistent effects.

The study contributes a multi method perspective combining econometrics modeling, dominance analysis found that FDI is a strategic driver for promoting export diversification in resource dependent economies. It reinforces finding in the literature through an analysis that accounts for the particularities of Algeria's economic.

Limitation include lack of sectoral detail in FDI data, the annual frequency of dataset and the inability to draw causal inferences from correlational models.

Algeria should focus on attracting high quality FDI, particularly in on oil sector, and complement this with targeted reforms to improve and facilitate doing business and infrastructures. Future research should apply similar methodologies to disaggregated data and explore dynamic policy interactions that can amplify the benefits of FDI on export structure.

6- References

1. (2025, Avril 15). Récupéré sur World Development Indicators (WDI) : <https://databank.worldbank.org/source/world-development-indicators>
2. (2025, Avril 18). Récupéré sur National Office of statistics : <https://www.ons.dz/>
3. (2025, 08 10). Récupéré sur UNCTAD: <https://unctadstat.unctad.org/datacentre/dataviewer/metadata/dimension/U.S.ConcentDiversIndices/indicator?>
4. (2025, AOÛT 10). Récupéré sur Bank of Algeria : <https://www.bank-of-algeria.dz/>
5. Alaya, M. (2012). The determinants of MENA export diversification: an empirical analysis. page 3.
6. Azen, R. &. (2003). The dominance analysis approach for comparing predictors in multiple regression. *Psychological Methods*. 129–148.
7. Bedassa Tadesse, e. (2011). *The impact of foreign direct investment on horizontal export diversification: empirical evidence*.
8. Bouklia, M. (2022). The importance of foreign direct investment in Algeria and its impact on its trade balance using the ARDL model .
9. Breiman. (2001). Random forests. *Machine Learning*. 5–32.
10. Cai, Z. F. (2000). Functional coefficient regression models for nonlinear time series. *Journal of the American Statistical Association*, 941–956.
11. D. F. Arawomo, A. O. (2014). Determinants of Export Diversification in Nigeria: Any Special Role for Foreign Direct Investment (FDI)?..
12. D. F. Arawomo, A. O. (2014). Determinants of Export Diversification in Nigeria: Any Special Role for Foreign Direct Investment (FDI)?
13. Dalila Nicet Chenaf, E. R. (2008). FDI, Diversification and Growth: An Empirical Assessment for MENA Countries.
14. Gamariel, G. (2022). FOREIGN DIRECT INVESTMENT AND EXPORT DIVERSIFICATION IN DEVELOPING COUNTRIES ,2022 .

15. Johnson, J. W. (2000). A heuristic method for estimating the relative weight of predictor variables in multiple regression. *Multivariate Behavioral Research*. 1–19.
 16. Keddari, K. T. (2022). ,Short and long term determinants of export diversification in Algeria ARDL model 1995-2020.
 17. Keddari, K. T. (2022). Short and long term determinants of export diversification in Algeria: ARDL model (1995-2020).
 18. Lundberg, S. M. (2017). A unified approach to interpreting model predictions. 4-5.
 19. Mekuriaw, Y. K. (2021). The Impact of Foreign Direct Investment (FDI) on Export Growth: Evidence from Ethiopia.
 20. Rarek, N. (2019). The Impact of Foreign Direct Investment on Economic Growth in Algeria: An (ARDL) Bounds Testing Approach.
 21. SHABANA NOUREEN, Z. M. (2016). Explaining Trends and Factors Affecting Export Diversification in ASEAN and SAARC Regions: An Empirical Analysis.
 22. SHABANA NOUREEN, ZAFAR MAHMOOD. (2016). *Explaining Trends and Factors Affecting Export Diversification in ASEAN and SAARC Regions: An Empirical Analysis*.
 23. Shapan Chandra Majumder, M. H. (2022). The effects of foreign direct investment on export processing zones in Bangladesh using Generalized Method of Moments Approach.
 24. *World Bank Group*. (2025, Avril 20). Récupéré sur <https://www.worldbank.org/ext/en/home>
-

7- Appendix

7-1- Descriptive Statistics and Graphical Representations

Date: 05/21/25
Time: 19:32
Sample: 1995 2022

	EXPORT_DIV	FDI	REAL_EXCAN GE_RATE	TRADE_OPE NESS	EXPLOITOTA L
Mean	0.799214	1.15E+09	84.47100	0.000239	0.962077
Median	0.806000	1.15E+09	76.23750	0.000200	0.969039
Maximum	0.870000	2.75E+09	141.9950	0.001274	0.984028
Minimum	0.720000	-5.38E+08	47.66300	8.61E-05	0.881487
Std. Dev.	0.035786	8.37E+08	25.20477	0.000218	0.025670
Skewness	-0.699823	0.118881	0.868833	3.983674	-1.593663
Kurtosis	3.047915	2.458978	2.684168	19.63912	5.165109
Jarque-Bera	2.288186	0.407442	3.639102	397.0620	17.32120
Probability	0.318513	0.815690	0.162099	0.000000	0.000173
Sum	22.37800	3.23E+10	2365.188	0.006698	26.93816
Sum Sq. Dev.	0.034577	1.89E+19	17152.57	1.28E-06	0.017791
Observations	28	28	28	28	28

