Journal of Management and Economic Sciences Prospects | Volume: 10 / N°: 01 (2026), p 612-628

The Impact of Brain Drain on Economic Growth: A Comparative Study between Algeria and the European Union

Marwa ZEHOUANI [*1], Aicha TOBBI [2]

[1] University of Ghardaia, Algeria, zehouani.marwa@univ-ghardaia.edu.dz

[2] University of Ghardaia, Algeria, tobbi.aicha@univ-ghardaia.edu.dz

Received: 01/04/2026 *Accepted: 30/06/2026* *Published: 30/07/2026*

Abstract:

This study aims to shed light on the impact and consequences of brain drain on economic growth between Algeria and the European Union during the period from 1990 to 2018, relying on a comparative analysis between the two regions thru some indicators that play a significant role in brain drain, such as (capital inputs, labor inputs, hours, quality, total factor productivity, information and communication technology, etc.)

One of the most important findings of this study is that the Algerian economy faces significant challenges due to the brain drain, especially with its heavy reliance on oil and gas and its chronic economic problems.

Keywords: Growth, Brain Drain, Impact of Brain Drain, Algeria, European Union.

Jel Classification Codes : F22, J61, O15, O11.

[*] ***Corresponding author***

1. INTRODUCTION

The migration of scientific talent and advanced skills from developing to developed countries in search of better employment opportunities, higher living standards, and the advantages of an advanced scientific and technological environment is known as "brain drain," and it is one of the most significant economic and social phenomena currently affecting the world. A wide range of professionals, including physicians, engineers, researchers, academics, and specialists in different fields, are part of this migration. Researchers and economists have become interested in this phenomenon because of its direct and indirect effects on the economies of nations, particularly developing ones that struggle to retain skilled workers despite making significant investments in their education and training.

Since human capital is regarded as one of the most important components of economic growth, along with physical capital and technology, brain drain has a significant impact on economic growth. High economic growth rates are experienced by nations with scientific and human expertise capable of innovation and production, whereas nations that lose their competencies suffer from lower productivity, slower economic growth, and delayed development. The impact of brain drain on economic growth, however, is a topic that needs investigation and study because some economists think it may have positive effects, such as financial remittances from migrants and the transfer of technology and knowledge upon their return.

Therefore, by looking at how brain drain affects human capital, productivity, investment, and unemployment, it becomes evident how important it is to research how it affects economic growth. It should also be taken into account how it affects the country's economy, both positively and negatively. The study problem can be stated as follows :

What is the effect of brain drain on economic growth in developing countries?

Given the rise in the migration of skilled minds from developing to developed nations and the ensuing social and economic repercussions.

1.1 Literature review:

- **Study (Lee, Kurbatskii, & Mironenkova, 2025)** : This study explores the impact of brain drain on income growth and compares its effects between the pre- and post-outbreak of Covid-19 periods based on unbalanced panel data for 60 countries covering the period 1995–2022. Using fixed effects and system GMM regressions, the results reveal that brain drain negatively influenced income growth during the pre-Covid-19 period, while its relationship became positive after Covid-19.

These results allow us to draw the following insights. First, the enhanced use of technology and the development of remote working blurred the importance of physical country borders. Second, after Covid-19, the role of nation-states became significant, which caused the return of populations to their original countries.

- **Study (Mohamed, Gomaa, & Abdelfattah, 2024):** This study aims at empirically estimating the impact of brain drain on economic growth and the impact of brain drain's externalities on this relation. This study used a two-way fixed effects model as an estimation methodology based on data from 140 developing countries from 2007 to 2022.The study find that brain drain has a positive impact on economic growth. This is confirmed by the impact of talent migration, which is assessed by the values of case studies (‘The Human Flight and Brain Drain’ sub-index Fragile States Index). It finds that the lower the income, the greater the positive impacts of brain drain. Moreover, the study used interaction variables or moderator variables to examine the impact of brain drain through its externalities on economic growth. The study concluded that brain drain still has a positive impact on economic growth ; however, the impact of brain drains externalities is negative. This reflects the great importance of remittances, which are excluded from the brain drain's externalities due to their inclusion in the brain drain index. Remittances play an important role in the most developing countries, especially low-income countries.

- **Study (Farhan, 2017)** : The objective of this research is to examine, the effect of brain drain on growth of Pakistan's economy from the year 1980 to 2016. In this study we used economic growth as dependent variable with GPD as its proxy, FDI with proxy of net inflow in million dollars, exports having proxy of net exports in million dollars, exchange rate through official exchange rate and inflation rate for which Consumer Price Index-CPI is used as independent variable. We employed OLS model to the test the effect of brain drain on economic growth. The stationary of variable is showed/confirmed with the help of Augmented Dickey Fuller –ADF Test and Phillip Parron-PP Test.

The empirical results shown that there is significant negative relationship between brain drain and economic growth of Pakistan. In addition, the hypothesis has also proved that brain drain and other descriptive variables have significant negative impact on economic growth.

2. Introduction to Brain Drain:

Brain drain refers to educated and skilled individuals migrating from poorer countries to richer ones for better opportunities. This is driven by economic inequality, political instability and lack of career opportunities at home. It not only results in loss of talented but also has long-term growth implications for both sending and receiving nations. (Farhan, 2017, pp. 6-10). In Algeria, the loss of qualified professionals takes a serious toll on critical sectors such as health and education -already in short supply- leading to delays in progress. When professionals go, the country loses expertise crucial to innovation and productivity. (Beine, Docquier, & Rapoport, 2001, pp. 276-277). Brain drain is often seen as a negative, but some experts have also found reasons to be optimistic. Outmigration can incent those who stay at home to become educated or trained so they learn higher and aspire for better. Also, the money migrants send home as remittances supports local economies. (Mohamed, Gomaa, & Abdelfattah, 2024)

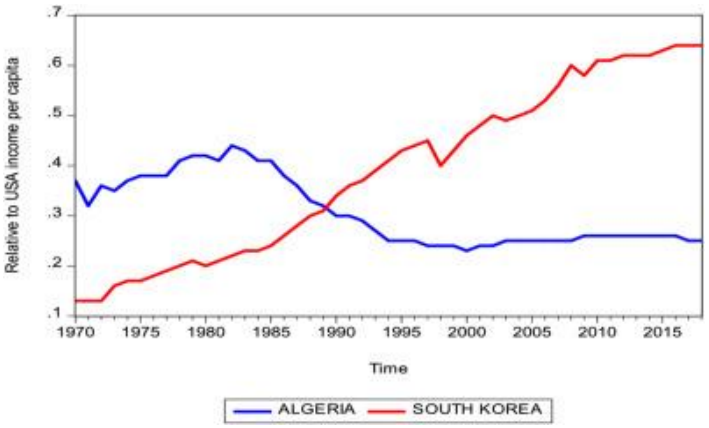
3. Overview of Economic Growth in Algeria

3.1 Historical Context

Algerian economic developments have been characterized by fluctuations, linked mainly to the hydrocarbon sector. After independence in 1962, the government adopted an etatist economic policy, which was characterized by an emphasis on the nationalization of the economy, particularly in natural resource management. During the 1970s, riding the wave of high oil prices, Algeria grew at a fast clip with its per capita GDP comparable to that of South Korea at the time but it did not last, and in the late 1980s when oil prices plummeted, the economy took a nosedive. In the following years, political chaos and bad economics triggered popular rage and massive protests in the ’90s that did not let up. Poor governance and a dysfunctional financial system undermined attempts to diversify away from oil. Algeria sought to recover in the early 2000s through political reforms and increased government expenditure, buoyed by rising oil prices on the world market. (Haouas , Ochi, & Labidi, 2021, pp. 4-5)

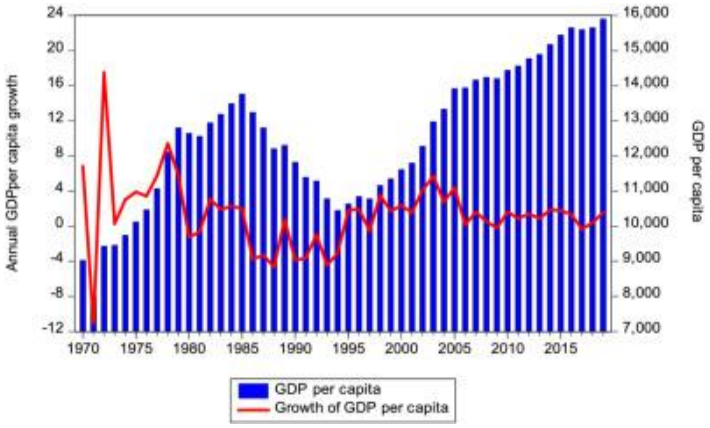
In spite of all that, the Algerian economy still has remained heavily dependent on hydrocarbons, accounting for some 97% of its foreign earnings. This reliance made it difficult to develop the types of innovation and technology that would spur long-term growth. Several social indicators did improve in some growth periods – such as longer life expectancy and higher rates of school enrollment – but the economic improvements were relatively small when compared to the rest of the developing world over a period of several decades. In retrospect, global market fluctuations played a significant role in determining the direction of the Algerian economy, but its domestic policies also made a very considerable difference. Problems like bureaucratic inertia, slow market reform and poor investment in building up people’s skills all combined to produce slow growth in productivity. These are just some of the factors that have shaped the shape of the Algerian economy today. (Musette & MUSETTE, 2022, p. 320)

Fig .01. Per capita income in Algeria and South Korea relative to the United States



Source: (Haouas , Ochi, & Labidi, 2021, p. 4)

Fig .02. Per capita GDP level and growth rates of Algeria



Source: World Bank (2019). (Haouas , Ochi, & Labidi, 2021, p. 5)

4. Understanding Brain Drain

4.1 Definition and Key Concepts

Brain drain refers to the migration of skilled and educated individuals, often from developing to developed countries, in search of better opportunities. Higher pay, better working circumstances, and a higher standard of living are the main reasons why professionals like scientists, engineers, and healthcare personnel depart. The British Royal Society coined the phrase in the 1960s to characterize scientists leaving the UK, although it currently applies to many emerging countries.

Brain drain is caused by a number of circumstances. Workers looking for greater salary and job stability overseas are drawn to countries with wage gaps. Migrants lose trust in their home countries' capacity to provide permanent employment due to political instability. Furthermore, local opportunities for professional advancement are constrained by low investment in research and development. (Beine, Docquier, & Rapoport, 2001, p. 276)

4.2 Causes of Brain Drain in Developing Countries

The vast disparity in economic prospects between poor and wealthy countries is a key cause of brain drain, particularly in the MENA area and Algeria in particular. Many highly qualified individuals look outside of their country for better employment opportunities, more compensation, and better working conditions. Many Algerian graduates are forced to search elsewhere due to the country's high unemployment and underemployment rates. The vast disparities in livings standard and available resources make wealthy economies more alluring. (Labib, 2020, pp. 204-206)

This tendency is also fueled by political instability; People frequently flee areas with poor governance or widespread corruption because these circumstances impede their ability to advance personally and professionally. Furthermore, inadequate funding for research and development deters talent from sticking around. Moving overseas is made simpler by Algeria's existing migratory routes, which are a result of its historical links to nations like France. (Docquier & Rapoport, 2007, pp. 4-7)

Skilled professionals feel underappreciated at home because of systemic issues including inadequate investment in education. Due to low earnings at home, many educated professionals go for higher pay elsewhere. Consequently, those who have profited from national education frequently choose to go in pursuit of better opportunities. (Musette & MUSETTE, 2022, pp. 51-55)

Policies pertaining to international migration further stoke the flames. Point-based systems in countries like Canada and Australia facilitate the relocation of highly educated professionals by favoring them. (DJEFLAT,

2002, p. 41). Cultural migration customs also have an impact. Moving abroad is virtually considered a rite of passage for families that have a history of doing so in search of better prospects overseas. This kind of thinking perpetuates the cycle, making what might be a national tragedy a typical experience for recent grads. (ZAIDI & HADJADJ, 2024, pp. 8-10)

5. The Impact of Brain Drain on Algeria's Economy

5.1 Loss of Human Capital

Algeria is affected in several ways. The country's capacity to pursue research and technical advancement is hampered by the loss of so much human capital. Algeria runs the danger of lagging behind in the global arena if there aren't enough seasoned professionals promoting scientific advancement. This brain drain hinders innovation and makes it more difficult for the nation to join multilateral alliances or draw in foreign investment. (Farhan, 2017, p. 8)

It has a significant financial impact, when skilled people depart, they take their economic worth, tax contributions, and earning potential with them, as they struggle with fewer competent employees, important industries like technology, healthcare, and education are all feeling the pinch. Efforts to enhance public services that rely on qualified professionals are hampered by this scarcity, which also puts additional strain on present employees, in summary, Algeria's economy and future growth are seriously threatened by the continuous exodus of trained personnel. (ZAIDI & HADJADJ, 2024, pp. 18-19)

5.2 Effects on Innovation and Technological Development:

Algeria's creativity and technical advancement are severely hampered by brain drain. The nation loses critical human capital required to progress research and technology when talented workers go, this scarcity affects vital fields like healthcare and education, where there are fewer professionals left to spearhead innovation.

Even though losing talent might lead to failures, if migrants stay in Algeria or return, it can occasionally spur innovation. International exposure to cutting-edge technologies can enhance abilities and motivate local innovators. (ZAIDI & HADJADJ, 2024, pp. 9-13). Algeria, like many developing countries, has trouble keeping competent people, which forces

them to look for job abroad. Every expert who departs contributes knowledge that businesses require, which restricts access to new technology and entrepreneurship, Positively, hopes associated with migration may stimulate more investment in education as a result of brain drain. (Docquier & Rapoport, 2007, pp. 3-4)

6. Comparative Analysis with the European Union

6.1 Brain Drain Trends in the EU

Algeria's creativity and technical advancement are severely hampered by brain drain. The nation loses critical human capital required to progress research and technology when talented workers go. This scarcity affects vital fields like healthcare and education, where there are fewer professionals left to spearhead innovation, even though losing talent might lead to failures, if migrants stay in Algeria or return, it can occasionally spur innovation. International exposure to cutting-edge technologies can enhance abilities and motivate local innovators. (Docquier & Rapoport, 2007, pp. 6-7)

Algeria, like many developing countries, has trouble keeping competent people, which forces them to look for job abroad. Every expert who departs contributes knowledge that businesses require, which restricts access to new technology and entrepreneurship, positively, hopes associated with migration may stimulate more investment in education as a result of brain drain. (Yu, 2021, pp. 133-134).

6.2 Economic Consequences for EU Member States

Both the nations losing talent and those acquiring skilled immigration are impacted by the complicated economic effects of brain drain on EU member states. Bringing in highly skilled workers is an opportunity for many EU countries, particularly those with elderly populations or declining birth rates, to fortify their labor forces, these immigrants increase productivity and spur innovation by filling critical positions in industries like engineering, technology, and healthcare. (Yu, 2021, pp. 133-136).

According to research, European nations that experience significant brain drain run the danger of lagging behind, especially if they don't have

strong policies in place to retain talent domestically or to capitalize on the abilities of its expatriates. Economic fragility brought on by an over-reliance on foreign knowledge might leave these nations vulnerable to shifts in EU immigration laws or migratory patterns. (Economic development in European Neighbourhood South countries, 2025, pp. -)

7. The Interplay between Brain Drain and Economic Dependency

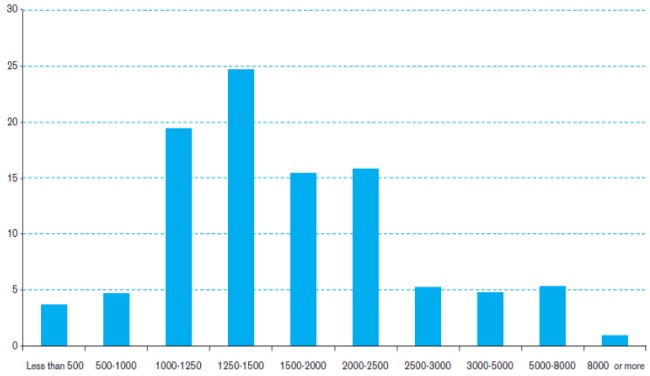
7.1 Case Study: Algeria vs EU Countries

Algeria and EU nations are impacted by brain drain in different ways. Algeria loses a lot of highly qualified workers, particularly in the fields of healthcare and education. Experts are driven to look for better prospects outside by political upheaval, socioeconomic uncertainty, and a lack of funding for domestic research. This tendency is exacerbated by sluggish economic changes, which leave Algeria with lower productivity and innovation. This loss is especially worrisome because of the nation's strong reliance on oil earnings. (Yu, 2021, pp. 131-133)

On the other hand, brain drain mostly occurs within the boundaries of EU nations. Workers relocate to wealthy nations like Germany and France from less developed areas. Richer countries are able to satisfy labor demands thanks to this movement, but source regions lose out on important human resources. Incoming talent increases productivity in several EU nations. Additionally, they observe that returning migrants contribute fresh perspectives and abilities that boost regional economies. Investment and growth in home regions are further supported by diaspora networks. (Musette M. , 2016, p. 323)

In order to balance these flows, EU policies increasingly prioritize keeping talent and promoting return migration. These tactics maximize benefits from brain circulation while minimizing losses. Algeria may benefit from using such strategies. Algeria may be able to retain more talented people or draw some back by addressing the underlying causes of brain drain and interacting with its diaspora, this comparison demonstrates how migratory patterns and their economic effects are influenced by a nation's stage of development. Algeria's progress is hampered by brain drain, but the EU handles it as part of a vibrant labor market. (Popper, 2019, pp. 11-12)

Fig .03. Level of Remuneration of Qualified Algerians in France (in euros)



Source: (Musette M. , 2016, p. 323)

7.2 Long-term Implications for National Growth

Particularly for nations like Algeria, the long-term consequences of brain drain on national growth are frequently multifaceted and intricate. Growth appears to be hampered by the loss of talented workers as it reduces human capital. Brain outflow can occasionally lead to "brain circulation," in which immigrants return home or give back resources and knowledge acquired outside, ultimately helping their nation. (Popper, 2019, p. 11).

Weighing both sides of this migration is crucial for emerging nations like Algeria. On the one hand, the departure of educated people can erode advantages in technology and specialized sectors and hamper innovation. This loss of local knowledge hinders the economy's ability to diversify, which is crucial for withstanding fluctuations in global markets, and slows down production. (Yu, 2021, p. 133).

Conversely, the prospect of leaving the nation frequently motivates individuals who remain to advance their knowledge and abilities, by raising the general skill level, this goal can produce a workforce that is more competent and significantly impacts economic advancement. (Farhan, 2017, p. 7). The local economy is also supported by remittances from Algerian expats. Some of the negative effects of losing talent can be mitigated by these financial transfers, which increase household incomes and stimulate expenditure. (Mohamed, Gomaa, & Abdelfattah, 2024, p. 771)

8. Strategies to Mitigate Brain Drain in Algeria

8.1 Policy Recommendations

A comprehensive strategy is needed to address Algeria's brain drain. By making investments in industries like technology, healthcare, and education, policymakers may increase local employment prospects. For competent individuals, diversifying the economy beyond hydrocarbons offers security and fulfilling jobs. Stability in politics is also important. Talent is drawn to and retained by transparent government and a stable political environment. Employees seek reassurance that uncertainty or unrest won't negatively impact their employment. Research and education funding are important. Raising academic standards and emphasizing research pertinent to Algeria's requirements develops domestic talent that can compete on a global scale. Collaborations between academic institutions and business provide practical experience and facilitate the connection between education and employment prospects. (Wickramasekara, 2002, pp. 12-14)

To deter experts from departing, competitive remuneration is crucial. Top employees might be retained by providing tax breaks or appealing compensation. Lastly, encouraging entrepreneurship through grants and coaching allows talented people to launch local enterprises. Algeria may better utilize its human resources by encouraging entrepreneurs and cutting bureaucracy. (Musette & MUSETTE, 2022, p. 66)

8.2 Enhancing Local Opportunities for Professionals

Increasing professional possibilities locally is crucial to lowering brain drain and boosting Algeria's economy. To retain talent domestically and draw in foreign workers to share their expertise, a comprehensive strategy is required, attractive employment may be created by branching out from hydrocarbons into technology, renewable energy, and tourism. Investing in these sectors creates a job market that appeals to workers across the country. (DJEFLAT, 2002, pp. 41-45)

Stronger connections between companies and universities facilitate the alignment of academic programs with the demands of the workplace. Raising the bar for research and education encourages innovation and promotes long-term growth, the transition to employment is facilitated by

practical experience gained via school-industry partnership, lastly, stability in the political and economic spheres fosters confidence among investors and experts, talent wants to stay and thrive in Algeria because of transparent governance, which lowers uncertainty, by combining these actions, Algeria has a genuine opportunity to stop brain drain and create a more robust and resilient economy. (Koczan, Peri, Pinat, & Rozhkov, 2021, p. 26)

9. CONCLUSION

9.1 Summary of Findings

Algeria's economy faces significant hurdles from brain drain, particularly given its heavy reliance on hydrocarbons and persistent economic problems. Political upheaval and volatile oil prices have hampered governance and impeded productivity improvements, which have negatively impacted the nation's economic trajectory, the issue gets worse when talented people leave since there is less talent available for innovation and competition. Due of Algeria's economic disparity with wealthier nations, skilled workers frequently depart the country, they travel overseas in search of better employment prospects and compensation. In addition to reducing tax money that might fund development, this movement causes severe shortages in sectors like healthcare and education, research and technological advancement are hampered by the loss of knowledge; The impacts of brain drain varies when compared to nations in the European Union. Although there is a labor deficit in EU member states, immigration workers who fill skill gaps also increase productivity, However, without these advantages, Algeria would suffer a net loss, and institutional problems make it challenging to retain talent. By removing the human capital required for development, brain drain exacerbates Algeria's economic problems, However, more migration may inspire those who stay to spend more in their education. The detrimental effects of brain drain can be reversed and sustainable economic progress can be encouraged by improving education to meet market demands and utilizing diaspora experience. (Haouas , Ochi, & Labidi, 2021), (Mekdad, Dahmani , & Louaj , 2014)

Table 01: Sources of GDP growth in Algeria, 1990-2018

		1990–2000	2000–2010	2010–2018	1990–2018
GDP growth (%)		1.28	3.89	2.97	2.71
Sources of GDP growth (%)					
Capital input	**All**	0.78	2.04	2.83	1.88
	ICT	0.37	0.72	0.84	0.64
	NICT	0.45	1.32	1.99	1.24
Labor input	**All**	1.94	2.8	1.26	2.00
	Quality	0.52	0.58	0.5	0.53
	Hour	1.42	2.22	0.76	1.46
TFP		−1.44	−0.95	−1.12	−1.16
Structure of GDP growth					
Capital input	**All**	60.93	52.44	95.28	69.37
	ICT	28.9	18.5	28.28	23.61
	NICT	32.03	33.94	67.00	45.76
Labor input	**All**	151.56	71.97	42.42	73.73
	Quality	40.62	14.91	16.83	19.53
	Hour	110.94	57.06	25.59	53.88
TFP		−112.5	−24.41	−37.7	−42.8

Source: (Haouas , Ochi, & Labidi, 2021, p. 9)

9.2 Concluding Remarks on Prospects for the Future

Algeria should diversify its economy beyond hydrocarbons and enhance local employment markets with higher wages and assistance in order to solve this. It's also critical to have a stable political environment that draws investment. A comprehensive plan that takes into account the opportunities and difficulties of qualified individuals departing is necessary to address brain drain in Algeria. Talent loss affects industries like healthcare and education, but over time, strengthening local circumstances can lead to significant advancements, economic growth may be temporarily slowed by brain drain, but it may also motivate those who stay to make greater educational investments. The idea of "brain circulation" should be

embraced by policymakers, this entails foreigners helping their home country by linking networks overseas, providing remittances, or sharing their knowledge when they return, similar difficulties are faced by EU nations, which gain from the abilities of immigrants and may teach Algeria valuable lessons. Algeria has to draw in and keep talented workers with higher wages, stable employment, and well-defined career paths in order to bring about long-lasting transformation. By enabling professionals to use their skills at home, encouraging entrepreneurship may help strengthen local economies; in order to prepare graduates to lead innovation and productivity, education must be in line with the demands of the labor market. Research and connections between foreigners and initiatives in Algeria are strengthened by utilizing the diaspora's skills, Algeria must ultimately weigh the advantages and disadvantages of brain drain. Effective policies may strengthen the economy and encourage talented people to contribute domestically instead of looking for opportunities outside. (ZAIDI & HADJADJ, 2024).

10. Bibliography List:

1. Lee, H.-S., Kurbatskii, A., & Mironenkova, M. (2025). The impact of brain drain on economic growth: A comparative analysis of Pre- and Post-outbreak of Covid-19 periods. Sustainable Futures, 10 , 083-101. doi:https://doi.org/10.1016/j.sftr.2025.101083
2. Musette, M. S., & MUSETTE, Y. (2022). Brain Drain from the Southern Mediterranean. STRATEGIA, revue des études de défense et de prospective, -(17), 46-77.
3. Beine, M., Docquier, F., & Rapoport, H. (2001). Brain drain and economic growth: theory and evidence. Journal of Development Economics, 64(1), 275-289. doi:https://doi.org/10.1016/S0304-3878(00)00133-4
4. DJEFLAT, b. (2002). NATIONAL SYSTEMS OF INNOVATION IN THE MENA REGION. WORLD BANK. Récupéré sur

https://documents1.worldbank.org/curated/en/615321468051039920/pdf/502690WP0Innovation0Box0342042B01PUBLIC1.pdf

5. Docquier, F., & Rapoport, H. (2007). Skilled Migration: The Perspective of Developing Countries. IZA (DISCUSSION PAPER SERIES)(2873), 2-33. Récupéré sur https://ftp.iza.org/dp2873.pdf
6. Economic development in European Neighbourhood South countries. (2025). Economic development in European Neighbourhood South countries. euro: Eurostat. Récupéré sur https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Economic_development_in_European_Neighbourhood_South_countries#
7. Farhan, F. M. (2017, may). IMPACT OF BRAIN DRAIN ON ECONOMIC GROWTH AND HUMAN CAPITAL FORMATION IN PAKISTAN: AN EMPIRICAL STUDY. KDI School of Public Policy and Management.
8. Haouas , A., Ochi, A., & Labidi, M. A. (2021). Sources of Algeria's economic growth, 1979–2019: Augmented growth accounting framework and growth regression method. ScienceDirect 'Regional Science Policy & Practice', 16(3), 1-19. doi:https://doi.org/10.1111/rsp3.12448
9. Koczan, Z., Peri, G., Pinat, M., & Rozhkov, D. (2021). The Impact of International Migration on Inclusive Growth: A Review. IMF Working Paper, 2021(088), 2-33. doi:https://doi.org/10.5089/9781513571966.001
10. Labib, L. (2020). The causes of the Algerian brain drain and its impact on development A field study on a sample of the emigrant competencies in the Gulf countries. AFAK for Science, 5(4), 199-208.
11. Mekdad, Y., Dahmani, A., & Louaj, M. (2014). Public spending on education and Economic Growth in Algeria: Causality Test. International Journal of Business and Management, II(3), 55- 70.
12. Mohamed, S. A., Gomaa, A., & Abdelfattah, K. (2024). The Impact of Brain Drain on Economic Growth: Addressing Diaspora

Externalities. Migration Letters, 21(S2), 762-786. Récupéré sur ISSN: 1741-8992

13. Musette, M. (2016). Brain Drain from the Southern Mediterranean. Strategics Sectors | Culture & Society, 320-325. Récupéré sur https://www.iemed.org/wp-content/uploads/2021/01/Brain-Drain-from-the-Southern-Mediterranean.pdf
14. Popper, R. (2019). THE FUTURE OF WORK AND SKILLS IN ETF PARTNER COUNTRIES. Euro union: ETF Working toghether Learning for life. Récupéré sur https://www.etf.europa.eu/sites/default/files/2019-07/Future%20of%20work%20and%20skills_Issues%20paper.pdf
15. Wickramasekara, P. (2002). Perspectives on Labour Migration 5 E Policy responses to skilled migration: Retention, return and circulation. skilled migrations (pp. 1-23). Institut de Sociologie de l'Université de Neuchâtel and the Forum suisse pour l'étude des migrations et de la population.
16. Yu, W. (2021). Brain drain and economic growth: evidence of productivity growth. European Journal of Government and Economics from brain circulation, 10(2), 128-145. doi:https://doi.org/10.17979/ejge.2021.10.1.7831
17. ZAIDI, H., & HADJADJ, A. (2024). FROM BRAIN DRAIN TO BRAIN GAIN Mobilizing the Diaspora networks to improve quality of scientific research in Algeria. -, -(-), 1-22. Récupéré sur https://www.researchgate.net/publication/385815106_FROM_BRAIN_DRAIN_TO_BRAIN_GAIN_Mobilizing_the_Diaspora_networks_to_improve_quality_of_scientific_research_in_Algeria