

BRAIN DRAIN IN NORTH MACEDONIA: KEY FACTORS AND EFFECTIVE MEASURES FOR HUMAN CAPITAL RETENTION AMONG EMPLOYEES

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ABSTRACT

This paper aims to examine the push factors influencing the intention of employees in North Macedonia to emigrate and identify potential measures to reduce the "brain drain" or "human capital flight" phenomenon. The subject of the study focuses on the attitudes of employees regarding their intention to leave the country, considering variables such as salary growth, promotion opportunities, trust in state institutions, the availability of alternative employment within the country, and employment practices in the country. The research employs a survey methodology, involving 120 respondents from various demographic backgrounds to capture diverse perspectives on the push factors driving emigration. A methodical statistical procedure was applied using simple linear regression to determine the impact of each economic factor on employees' intentions to leave. Additionally, multiple linear regression was utilized to see how various push factors together influence the employees' intention to leave the country. The results reveal that 62% of respondents are inclined to leave the country, particularly younger employees aged 31-40 with higher education levels. The primary factor influencing this intention is the lack of alternative employment opportunities in North Macedonia. These findings underscore the need for targeted policies and measures to retain human capital and prevent further economic and demographic decline.

Keywords: Brain drain, Human capital, Migration, North Macedonia.

JEL Classification: J08, J6, O15.

1. INTRODUCTION

There is increasing acknowledgment of the risks associated with the uncontrolled recruitment of skilled workers in both developed and developing nations. Even though the dangers are well-known, minimal action has been taken to address the issue. In recent years, source countries have experienced a growing outflow of skilled labor, partly due to host countries increasingly favoring skilled workers in their immigration policies. This problem is particularly severe in small developing nations. Since human capital plays a crucial role in economic growth (Lucas, 1988), a significant brain drain could greatly hinder the development of the affected countries.

Interest in the topic of brain drain has recently been renewed, with numerous new papers being published and various international organizations and universities launching long-term research projects. For a long time, economists and activists from developing countries have raised concerns about the shortage of skilled professionals in their regions. However, the recent literature on the Macedonian case appears to be somewhat disconnected from these concerns expressed by those directly affected (young and employed individuals). This paper suggests that the "brain drain" should be considered similarly to how we view capital flight, and increased capital flight is treated as an indicator of the need for policy correction.

The Western Balkan region faces a significant demographic challenge marked by a decline in population due to youth emigration and low birth rates. The fact that most people emigrating are young, educated, and highly skilled poses a serious threat to the region's development. Despite progress in improving economic and social prospects over the past decade, structural challenges and socio-economic hardships continue to incentivize emigration from the Western Balkan economies (OECD, 2022).

Over a longer period, a dominant representation of emigration is characteristic of North Macedonia. The issue of brain drain is an important subject, particularly for developing countries like North Macedonia. The total emigration from North Macedonia takes place under the influence of numerous and diverse factors: changes in the socio-economic development of the country; unemployment; disrespect for labor; underestimation of expertise and limited opportunities for advancement in the profession; established migration links, as well as favorable changes in the immigration policies of the receiving countries as a factor that must not be underestimated. In the period after 2000, the number of young highly educated persons, as well as final year students from the faculties of technical and natural sciences who are thinking or planning to go abroad, is increasing (National strategy for networking, cooperation and reducing the outflow of highly educated and professional staff 2013-2020). According to the latest data from the World Bank, about 29.1% of highly educated individuals live and work outside the country, and the total percentage of expatriates is 21.9%.

The emigration, especially of young highly educated, and professional staff from North Macedonia, is significantly reflected in the aging process of the country's population. In recent decades, North Macedonia has faced numerous challenges arising from the existing economic and social conditions that have a direct impact on the population. While birth rates are decreasing, and thus the participation of young people in the overall structure of the population is decreasing, the number of old people is increasing more and more. All that implies changes in the quality of the labor force and a decrease in the level of human capital, and thus negative effects in the area of economic growth and development of the country. In the post-COVID-19 pandemic world, it's even more important to understand why developing countries should care about human capital and protect hard-won gains from being eroded.

A major challenge for North Macedonia is its weak education system, which does not meet labor market demands and serves as a significant incentive for emigration, particularly among the youth.

To address the issue of brain drain or human capital flight problems, the focus should be on analyzing and improving incentives rather than imposing restrictions. Therefore, in the analysis of the intention of the employees to leave North Macedonia, it is extremely important to recognize their interest in leaving and the reasons behind it and to promptly take appropriate mechanisms to prevent them, from retaining the talents that contribute to the economy in the country and have a significant share in the gross domestic product.

The subject of this paper covers the issue of the "brain drain" phenomenon, observing it through the prism of the attitudes of the employees in North Macedonia in relation to the factors that can influence their intention to go abroad, as well as, the measures that can be taken by the country in order to prevent this phenomenon and keep people in the country.

This paper aims to gain knowledge about the intention of employees in the country to leave it and go abroad, by analyzing the influence of five factors, namely: salary growth in their institution, opportunities for career advancement, trust in state institutions, the possibilities for alternative employment and the employment practices in the institutions (whether employment is carried out according to the competencies and level of education), as well as to determine, according to the employees, which are the most significant measures that should be taken by the country to reduce the intensity of brain drain phenomenon. After the introduction, Section 2 provides the literature overview on the brain drain phenomenon. Section 3 contains information about the data and methodology used. Section 4 of the paper presents the empirical analysis of the impact of push factors on the intention of employees in North Macedonia to emigrate and identifies potential measures to reduce the "brain drain". Finally, section 5 summarizes the results of the theoretical and empirical research included in the paper, with some general policy prescriptions and suggestions for further research.

2. LITERATURE REVIEW

Over the past four decades, developing countries have continued to experience a significant outflow of skilled professionals, despite efforts by both developed and developing nations to address the problem. While developed countries have implemented immigration reforms to limit the influx of migrants, and developing nations have taken measures to retain their skilled workforce, brain drain remains a persistent issue. The literature on brain drain spans several generations, offering diverse economic perspectives on its causes and consequences.

Despite the positive financial aspects highlighted by early studies (Solow, 1956; Grubel and Scott, 1966), the broader economic consequences of brain drain have been more critically examined. Beginning with studies from the 1970s (e.g., Mankiw *et al.*, 1992), economists started to emphasize the negative effects of brain drain on the intellectual capital of emigrating countries. The departure of highly skilled individuals reduces the knowledge base necessary for driving economic growth and innovation, which in turn hinders long-term development. Brain drain also creates social and economic gaps, particularly in the benefits of education and fiscal policy, which are not fully captured by remittance flows.

Other studies (Haque, 2005) recognize the need to focus on the role of human capital in driving economic growth, yet note that the international movement of talent has not received as much attention as the flow of physical capital. Economic theory suggests that a strong education system can promote economic growth, but many skilled professionals from developing countries leave due to limited opportunities at home. For instance, in less developed countries, such as Africa, the main drivers of migration include low levels of development, political instability, and wage disparities (Docquier *et al.*, 2007; Marfouk, 2007). These factors, combined with the allure of better career prospects and a more supportive research environment abroad, contribute to the persistent outflow of talent.

Gungor and Tansel (2014) found that family and social considerations, along with a lack of job opportunities in specialized fields, are critical in determining whether professionals return to their home countries. Mishra (2023) reinforces this finding in his study, where limited job opportunities and career prospects are the primary causes of brain drain. According to the study, creating a conducive environment for professional growth—particularly in sectors such as healthcare, education, infrastructure, and technology—can help retain skilled workers. The brain drain phenomenon in the region, particularly in Croatia, Serbia, Albania, and North Macedonia has become a critical issue, with significant implications for each country's demographic, economic, and social structures.

Hornstain Tomic and Taylor (2018) found that the emigration of tertiary-educated young people in Croatia has increased since the economic recession and EU accession, shifting the

discourse from national disloyalty to efforts to mitigate push factors and attract skilled migrants back. They highlight that education reforms are seen as crucial, though political disagreements have hindered progress, while the potential benefits of circular migration and the involvement of NGOs in promoting practice-oriented education have influenced recent policy discussions. Radonjic and Bobic (2021) argue that the massive emigration of educated individuals from Serbia causes significant deficits that cannot be solely measured in monetary terms, with deeper impacts on demographics, social cohesion, and local democracy. They also explored contemporary transnational migration perspectives and suggested policies to harness the potential of human capital, social networks, and circular mobility, focusing on the benefits of diaspora engagement and return migration.

Tataj and Akbas (2021) analyzed the relationship between human capital and the labor market in Albania, focusing on the impact of brain drain. The study highlights the role of international migration policies, particularly the EU's role in attracting skilled workers from developing countries like Albania. They estimated that Albania has become a sending country for its workforce due to the increasing number of young people migrating to the EU. Their study identified two key consequences: a decrease in the workforce and a crisis in the pension system, while also noting that despite being one of the youngest middle-aged countries in Europe, brain drain has led to population decline.

The existing research on brain drain in North Macedonia focuses on the reasons for brain drain among students or discusses the economic and demographic effects of emigration. Also, there are studies that analyze the trends and impact of brain drain on national growth and innovation, with a focus on educational outcomes and the general migration patterns of students.

The study by Nikolovska (2004) investigates the transitional challenges faced by North Macedonia since its independence in 1991, marked by high unemployment and poverty. It focuses on the migration of skilled labor, exploring the reasons for brain drain and existing policies to address it. The paper examines the rise in domestic students and those studying abroad, assessing the potential negative impacts and any possible benefits of skilled emigration. Nikolovski (2012) analyzes emigration and remittances as mechanisms for adjusting the Macedonian labor market. The findings suggest that men, urban workers, and job seekers are more likely to emigrate, while women and married individuals show less inclination. The paper concludes that emigration and remittances are primarily survival strategies rather than investment opportunities, emphasizing the need for targeted policy measures to support the most vulnerable unemployed populations in North Macedonia.

Janeska *et al.* (2016) discuss brain drain trends from North Macedonia over the last two decades, noting that since 2008, the country has been among the top ten globally for brain drain intensity. They found that the direct effects include slower economic growth and reduced innovation due to a decrease in human capital, and that few highly educated emigrants return. Brain drain also accelerates population aging and reduces the reproductive labor force.

The study of Dinkovski and Markovska-Simoska (2018) investigated the phenomenon of "brain drain" in North Macedonia, focusing on its effects on sustainable development. It highlights the trend of highly skilled and educated professionals emigrating from North Macedonia and the broader Balkan region to developed countries. The research analyzes the implications of this migration on the labor market and the transition process in North Macedonia compared to EU countries. Utilizing detailed questionnaires from students at various public and private faculties in North Macedonia, the study found that the brain drain poses a serious threat to sustainable development and emphasizes the need for national measures to address this issue.

3. METHODOLOGY AND DATA

To address the subject and achieve the aim of this paper, the following methods have been employed: descriptive analysis, historical method, methods of analysis and synthesis, quantitative and statistical methods, and methods of induction and deduction. A survey questionnaire was used as an instrument for data collection, which was conducted in the period June - July 2024. The target group of respondents included in the survey were employees from different sectors (public sector, private sector, non-profit organization) in North Macedonia, namely, a random sample of 120 respondents with different demographic characteristics. The questions in the survey questionnaire, in addition to the scope of questions to determine demographic characteristics (gender, age, education, etc.), also contain questions to determine the impact of salary growth in their institution, opportunities for career advancement, trust in state institutions, opportunities for alternative employment and employment practices in institutions (in terms of whether employment is carried out according to competencies and level of education) on their intention to leave the country. For the purposes of this paper, this questionnaire also helped in determining what are the most significant measures that, according to the employees, should be taken by the country to reduce the intensity of this problem. Thus, on a scale of 1 - 4, the employees ranked (according to the degree of importance) each proposed measure that, according to them, should be taken by the state to balance and reduce this problem. The measures that were proposed in the survey questionnaire and ranked by the employees are the following: Creating greater employment opportunities; Employees' salary increase; Improving the quality of education at all levels; Transition from brain drain to brain gain of highly educated personnel by increasing the level and volume of return of intellectual emigration from the Republic of North Macedonia and increasing awareness of human capital development; Greater role of employment agencies for the most successful students and apprentices in their profession; Motivating scholarships and financial relief for the most successful students when continuing their education in the second and third cycle of studies; Opening of state career centers that will monitor talented and successful students and that will guarantee their appropriate employment after completing their education and Preference in the employment of the most successful students without the need to obtain consent from the relevant ministries during employment.

The questionnaire was conducted through the electronic service for collection and analysis of research data "Kwik Surveys", as well as sent electronically (via e-mail and social networks) to the respondents.

To investigate the subject and the aim set in this paper, the following hypotheses have been set:

Alternative hypothesis 1: The salary growth in the institution has a statistically significant influence on the intention of employees in North Macedonia to leave the country and go abroad.

Alternative hypothesis 2: Opportunities for career advancement in the institution have a statistically significant impact on the intention of employees in North Macedonia to leave the country and go abroad.

Alternative hypothesis 3: Trust in state institutions has a statistically significant influence on the intention of employees in North Macedonia to leave the country and go abroad.

Alternative hypothesis 4: Opportunities for alternative employment in the country have a statistically significant impact on the intention of employees in North Macedonia to leave the country and go abroad.

Alternative hypothesis 5: Employment practices in the institutions have a statistically significant influence on the intention of the employees in North Macedonia to leave the country and go abroad.

Alternative hypothesis 6: Salary growth in the institution, opportunities for career advancement in the institution, trust in state institutions, opportunities for alternative employment, and

employment practices in the country do not have an equal impact on employees' intention in North Macedonia to leave the country and go abroad.

Alternative hypothesis 7: The most significant measures that country authorities should pay more attention to reduce the brain drain phenomenon are: increasing the salaries of employees and creating greater employment opportunities.

Therefore, the question of the extent to which employees in North Macedonia agree with the existence of certain economic factors and conditions in their institution, as well as in the country, was related to the question of determining the intention of the employees to leave the country and going abroad. Therefore, the methodical statistical procedure of *simple linear regression* was applied, through which it was possible to determine the impact of each economic factor on the intention of employees to leave (*Alternative hypothesis 1 to 5*), as well as *multiple linear regression*, to identify those factors that have the greatest impact on the analyzed dependent variable – the employees' intention to leave the country, i.e. to see how various factors together influence the employees' intention to leave the country (*Alternative hypothesis 6*).

4. RESEARCH FINDINGS AND DISCUSSION

Before presenting the regression analyses, it is important to first highlight the interest of the country's employees in going abroad, based on their age and level of education. Specifically, 62% of the employed respondents expressed a willingness to leave the country, with 61% of them being aged 31 - 40. Additionally, 53% of these individuals possess higher education degrees, and 28% hold a master's degree. This profile of employees willing to emigrate poses a significant threat to the country's demographic structure, accelerating the aging population, while also undermining its economic potential and development. The loss of skilled professionals not only diminishes the labor force but also weakens the foundation for future growth and innovation.

The findings from the *simple regressions* conducted are summarized and presented in Table 1. Based on Table 1, it can be concluded that *there is a positive correlation* between all analyzed factors and the intention to leave the country among employees in North Macedonia. Pearson's correlation coefficient ranges from 0.091 for opportunities for career advancement in the institution to 0.315 for opportunities for alternative employment in the county. The coefficient of determination (r^2) measures the strength of the relationship between the fitted model and the dependent variable on a scale from 0 to 1. In this case, the coefficient of determination ranges from 0.008 to 0.099. Typically, the higher the value of r^2 , the better the regression model matches the observed observations. But models with a low value of r^2 (as in the example analyzed), are also well-fitted models, and this is so for several important reasons. Namely, certain scientific fields exhibit inherently higher unexplained variation, and in these, the value of r^2 is lower. For example, analyses of the coefficient of determination in which the focus is placed on the person and his behavior, show values that are lower than 0.5. This is because human resources are more complex to predict than other types of resources. Also, if the model shows a low value of r^2 , and at the same time the independent variables are statistically significant, significant conclusions can still be made about the relationship between the analyzed variables. A low value of the coefficient of determination does not negate or reduce the importance of any significant variables, as statistically significant p-values continue to identify relationships, and hence the coefficients have the same interpretation.

Table 1: Simple regression – economic factors and conditions in the institution/country and the intention of the employees in North Macedonia to go abroad

	Coefficient b_1	Pearson correlation coefficient (r)	Coefficient of determination (r^2)	p -value
Salary growth in the institution	0.076	0.155	0.024	0.091
Opportunities for career advancement in the institution	0.043	0.091	0.008	0.322
Trust in state institutions	0.136	0.143	0.020	0.120
Opportunities for alternative employment in the country	0.187	0.315	0.099	0.000
Employment practices in the country	0.090	0.124	0.016	0.175

(Source: Authors' calculations)

In this analysis, the slope coefficient b_1 ranges from 0.043 for opportunities for career advancement in the institution to 0.187 for opportunities for alternative employment in the country. In other words, it means that if the opportunities for alternative employment in the country (in terms of lack) increase by 1 unit, the intention to leave the country among employees will increase by 0.187 units.

The p -value for the opportunities for alternative employment in the country is the only which is lower than the significance level " α ", which means that we can *accept the fourth alternative hypothesis*, or *opportunities for alternative employment in the country have a statistically significant impact on the intention of employees in North Macedonia to leave the country and go abroad*.

In terms of *multiple regression*, five independent variables (regressors) and one dependent variable (regressand) are included. The independent variables are the five push factors (salary growth in the institution, opportunities for career advancement in the institution, trust in state institutions, opportunities for alternative employment in the country and employment practices in the country), while the dependent variable refers to the employees' intention to leave the country and go abroad.

Table 2 presents the slope coefficient (b_1) and the p -value. In multiple regression, there is a change in the values of the b_1 coefficient of each of the analyzed factors, as well as in the p -value, because this statistical method measures the influence of mutual dependencies and interactions of several phenomena at once. The slope coefficient ranges from -0.017 for employment practices in the country to 0.176 for the opportunities for alternative employment in the country. Again, it is essential to state that the coefficient of multiple determination r^2 has a low value and is 0.106.

Table 2. Multiple regression – economic factors and conditions in the institution/country and the intention of the employees in North Macedonia to go abroad

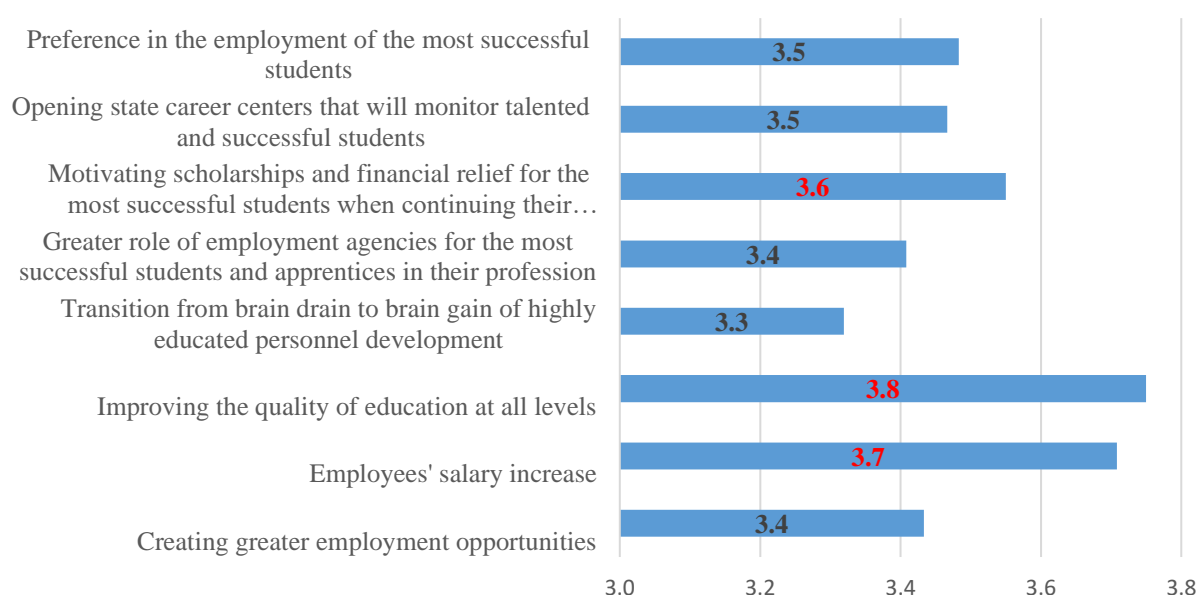
	Coefficient b_1	p -value
Salary growth in the institution	0.044	0.430
Opportunities for career advancement in the institution	-0.020	0.702
Trust in the state institutions	0.039	0.667
Opportunities for alternative employment in the country	0.176	0.004
Employment practices in the country	-0.017	0.818

(Source: Authors' calculations)

As shown in the analysis, opportunities for alternative employment in the country have the most significant influence on the intention to leave the country. This is supported by a p-value that is lower than the significance level " α ," indicating statistical significance for this variable. In contrast, the p-values for the other independent variables show statistical insignificance, highlighting that alternative employment opportunities play the most critical role in shaping employees' decisions to leave the country. This *confirms the sixth alternative hypothesis*, i.e. *the growth of the salary in the institution, the opportunities for career advancement in the institution, trust in state institutions, opportunities for alternative employment in the country, and employment practices in the country do not have an equal impact on the intention of employees in North Macedonia to leave the country and go abroad.*

According to the employees surveyed, the most impactful measures the government can adopt to reduce the outflow of young intellectuals and increase retention include improving the quality of education at all levels (mean value 3.8), employees' salary increase (mean value 3.7) and motivating scholarships and financial relief for the most successful students when continuing their education in the second and third cycle of studies (mean value 3.6). These measures are closely related to the increase of greater employment opportunities. The improvement of the quality of education on its part guarantees greater and better opportunities for employment, and also the facilitation of the best students by providing scholarships with which they would be stimulated to continue their education at higher cycles may contribute to greater employment opportunities as a result of the expertise that this highly qualified personnel would bring with them to their workplaces. The analysis of the mean values supporting these conclusions is presented in Figure 1.

Figure 1: Employee views on government strategies to mitigate brain drain in North Macedonia – mean value



(Source: Excel analysis, 2024)

Based on the results, *the last alternative hypothesis is also accepted, that is, the most significant measures that country authorities should pay more attention to reduce the brain drain phenomenon are: increasing the salaries of employees and creating greater opportunities for employment.*

5. CONCLUSION

The findings of this study underscore a critical issue facing North Macedonia: a significant portion of its skilled labor force, especially younger professionals, is considering emigration due to unfavorable economic and professional conditions. With 62% of surveyed employees expressing an intention to leave, particularly those aged 31 - 40 and those with higher education or advanced degrees, the country faces a potential loss of intellectual capital, which could severely impact its economic and social development. This trend threatens to accelerate the aging of the population, exacerbate skill shortages, and reduce the pool of future leaders, innovators, and entrepreneurs who are vital for national growth. This is consistent with the European Commission study “Social Impact of Emigration and Rural-Urban Migration in Central and Eastern Europe” for 25 countries (based on the World Bank data), where North Macedonia stands out with the highest emigration rate of the tertiary educated persons in the group of the candidate countries for membership in the European Union.

The study identifies the lack of alternative employment opportunities as the most significant factor influencing the decision to emigrate, more so than other factors analyzed in the paper. The results indicate that the most urgent and impactful measure is to create diverse and sustainable employment opportunities that align with the skills and aspirations of the country’s labor force.

According to the European Training Foundation (2021), engineers, then medical staff, and more recently also staff from other areas are covered by emigration movements. Regardless of the growing interest of young people in the faculties of technical sciences and the doubling of the number of students of medical sciences, and consequently, the increase in the number of

graduates from these fields, a continuous shortage of engineering staff and doctors is evident. High-skill emigration exists in other sectors, too (sales and marketing support, economic consultancy). Therefore, while alternative employment opportunities are identified as the most significant factor, North Macedonia should delve deeper into these specific sectors which could most effectively retain talent.

The issue of brain drain in North Macedonia has been acknowledged by policymakers as a critical challenge. The primary document addressing this matter, The Resolution of Migration Policy of the Republic of North Macedonia 2021-2025, outlines the current migratory trends and establishes a policy framework aimed at mitigating the migration issue. This resolution includes tools designed to reduce the impact of migration and sets forth specific goals and actions to address it.

The objectives and actions according to the Resolution should focus on:

1. Establishing conditions to reduce the intensity of emigration by identifying and addressing the key factors driving large-scale permanent migration;
2. Supporting temporary emigration and promoting labor force circulation from North Macedonia; and
3. Encouraging return migration while facilitating the reintegration of Macedonian citizens back into the country.

In addition to the first objective, implementing targeted scholarship and job placement programs in critical sectors, such as IT or engineering, would include incentives for graduates to remain in the country, such as competitive salaries, career development opportunities, and housing subsidies, to reduce the push factors driving permanent emigration. Creating bilateral agreements with EU countries that allow North Macedonian workers to engage in temporary employment abroad while ensuring their return would support temporary emigration and promote labor force circulation from North Macedonia. As part of the third action, engagement and information strategies are key, alongside financial incentives. Reintegration support includes a range of services like counseling, tailored advice, and assistance with employment, housing, education, and welfare. In practice, North Macedonia could adopt a comprehensive "return migration" program offering such incentives and support, including tax breaks, business start-up grants, and reintegration services, to help returnees transition smoothly and contribute to the domestic economy.

Therefore, by implementing well-designed, inclusive, and sustained measures, North Macedonia can reduce the outflow of skilled professionals and turn this challenge into an opportunity for growth.

While this study provides valuable insights into the factors influencing the brain drain phenomenon in North Macedonia, it suggests avenues for future research. The analysis primarily focuses on a sample of employees from diverse sectors within the country but could be extended to capture a more comprehensive range of educational levels, age groups, and other demographic and sector characteristics to better understand the degree of emigration intentions among different segments of the population. Additionally, future studies could benefit from including comparative analyses with similar countries experiencing brain drain, particularly those in the Western Balkans or other developing regions. Such comparisons could help identify common patterns, shared challenges, and effective policy measures tailored to each country's specific context, thereby offering a broader perspective on how to mitigate the impact of brain drain across various socio-economic landscapes.

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