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# THE INFLUENCES OF THE BRAIN DRAIN OF ISRAELI STUDENTS STUDYING ABROAD ON THE ISRAELI LABOR MARKET WITH COMPARISON TO THE INTERNATIONAL SITUATION

Doctoral thesis in Economics

521.02. World economy; International economic relations

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**ȘCOALA DOCTORALĂ ȘTIINȚE JURIDICE ȘI ȘTIINȚE ECONOMICE**

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# INFLUENȚA ”EXODULUI DE CREIER” AL STUDENȚILOR ISRAELIENI CARE STUDIAZĂ ÎN STRĂINĂTATE PE PIAȚA MUNCII ISRAELIENE ÎN COMPARAȚIE CU SITUAȚIA INTERNAȚIONALĂ

Teză de doctor în științe economice

521.02 Economie mondială; Relații economice internaționale

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Doctor în științe economice,
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**CHIȘINĂU, 2024**

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**ANNOTATION**

**Amoun-Habashi Manal Hassan, the influence of the brain drain of Israeli students studying abroad on the labor market in Israel in comparison to the international situation Dissertation for the degree of Doctor of Economics. Chisinau, 2024**

**Thesis structure:** introduction, three chapters, general conclusions and recommendations, bibliography of 248 titles, 43 appendices, 130 pages of basic text, 20 figures, and 22 tables. The results of the thesis were presented in 26 scientific articles.

**Keywords:** Brain Drain, Academic Mobility, Higher Education and academic demand, Academic Studies and R&D Outputs, Labor Market and Employment, and National Economic **Model.**

**The aim of this dissertation:** to present and analyze the phenomenon of the Israeli brain drain and academic mobility, and to propose a national comprehensive model and recommendations to address and minimize the problem.

**The objectives of the paper:** to provide solutions to the causes of the "brain drain" phenomenon, to propose adaptation strategies; to develop a national model for forecasting and minimizing the extent of the "brain drain"; to make recommendations for solving the problem.

**Scientific novelty and originality:** development of an innovative economic model and determination of solutions for the movement of intellectual resources; formulation of principles of state policy in the field of intellectual migration; provision of methodological recommendations and innovative recommendations to Israeli ministries aimed at reducing the demand for academic mobility and flight of minds.

**The results obtained that contribute to solving the discussed problem**: the need to design and implement immediate solutions for future prediction and immediate reduction of the dimensions of the Israeli brain drain and its negative effects by designing and adopting a comprehensive economic-academic model, recommendations and immediate actions at the local and international level to prevent the outflow of Israeli professionals.

**The theoretical significance and value of the thesis:** are by obtaining comprehensive empirical and theoretical knowledge about the discussed issue, applicable solutions, and coping strategies.

**The applicative value:** analyzing a comprehensive national model which enables future forecasting of the discussed phenomenon and its effects especially on the Israeli academic system and the labor market, based on systematic data analysis. The theoretical foundations of the global problem of migration of intellectuals are also aimed to be used in the educational process, and in developing international educational programs and marketing strategies.

**The scientific problem**: the threat of the growing phenomenon of the Israeli brain drain, which led to the development of an innovative national model, which the author recommends implementing.

**Implementation of scientific results:** the obtained and recommended recommendations are being implemented by the involved and related authorities, bodies, and Ministries in Israel.

**ADNOTARE**

**Amount-Habashi Manal Hassan Impactul „exodului de creiere” al studenților israelieni, care studiază în străinătate, asupra pieței muncii din Israel în comparație cu situația internațională”. Teza de doctor în științe economie. Chișinău, 2024**

**Structura tezei:** introducere, trei capitole, concluzii generale și recomandări, bibliografia din 248 titluri, 43 anexe, 130 pagini de text de bază, 20 de figuri, și 22 tabele. Rezultatele tezei au fost expuse în 26 articole științifice.

**Cuvinte cheie:** Exodul creierelor, mobilitatea academică, învățământul superior, cererea academică, studiile academice, rezultatele cercetării și dezvoltării, piața muncii, ocuparea forței de muncă, modelul economic național.

**Scopul lucrării:** este de a prezenta și a analiza fenomenul exodului de creiere și al mobilității academice israeliene; de a sugera un model național cuprinzător, a da recomandări pentru rezolvarea problemei și minimizarea dimensiunilor sale.

**Obiectivele lucrării:** a oferi soluții la cauzele fenomenului „exodului de creiere”, a propune strategii de adaptare; a elabora un model național de pronosticare și de minimizare a amplorii „exodului de creiere”; a formula recomandări pentru soluționarea problemei.

**Noutatea și originalitatea științifică:** dezvoltarea unui model economic inovator și identificarea unor soluții privind circulația resurselor intelectuale; formularea unor principii de politică de stat în domeniul migrației intelectualilor; furnizarea de recomandări metodologice și recomandări inovatoare pentru ministerele israeliene, care au ca scop reducerea cererii de mobilitate academică și a exodului de creiere.

**Rezultatele obținute care contribuie la soluționarea unei probleme științifice importante:** identificarea unor soluții imediate pentru prevenirea și reducerea dimensiunilor „exodului de creiere” israeliene și a efectelor sale negative, prin proiectarea și adoptarea unui model economico-academic cuprinzător; lansarea unor recomandări și acțiuni imediate la nivel local și internațional, pentru a preveni exodul profesioniștilor israelieni.

**Semnificația teoretică:** obținerea de cunoștințe empirice și teoretice cuprinzătoare despre problema discutată, soluțiile aplicabile și strategiile de rezolvare.

**Valoarea aplicativă a lucrării:** dezvoltarea unui model național cuprinzător, care să permită prognozarea fenomenului discutat și a efectelor acestuia, în special asupra sistemului academic israelian și a pieței muncii, pe baza unei analize sistematice a datelor. Fundamentele teoretice ale problemei globale a migrației intelectualilor sunt menite să fie utilizate în procesul educațional și în dezvoltarea programelor educaționale internaționale și a strategiilor de marketing.

**Problema științifică importantă soluționată în domeniul economiei:** combaterea fenomenului în creștere al „exodului de creiere” israeliene a contribuit la dezvoltarea unui model național inovator.

**Implementarea rezultatelor științifice:** rezultatele obținute sunt implementate de către autoritățile responsabile de fenomenul „exodului de creiere”, iar recomandările au fost propuse organismelor și ministerelor aferente din Israel.

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**CBS** – Israel's Central Bureau of Statistics

**CHE** – Council for Higher Education of Israel

**CIS**- Center for Internet Security

**DARE**- Drug Abuse Resistance Education

**DIMA**- The Diving Equipment & Marketing Association

**EHEA** – European Higher Education Area

**ERASMUS** – European Region Action Scheme for the Mobility of University Students

**EU** – European Union

**GDP** – Gross domestic product

**GERD**- Gastroesophageal Reflux Disease

**GNI**- Gross National Income

**GNP** – Gross national product

**HEC**- Higher Education Council

**HSMP**- Highly Skilled Migrant Program

**IDF**- Israel Defense Forces

**ILO**- International Labor Organization

**IOM** – International organization for migration

**ISF**- Israel Science Foundation

**IT**- Information Technology

**KIIS**- Kyiv International Institute of Sociology

**NATO**- North Atlantic Treaty Organization

**NIS**- New Israeli Shekel

**NTC**- Negative Temperature Coefficient

**OECD** – Organization for Economic Co-operation and Development

**PBC**- Planning and Budgeting Committee

**PRC**- Professional Regulation Commission

**QS Ranking**- Quacquarelli Symonds

**RAND**- Research and Development

**R&D**- Research and development

**STP**- Spanning Tree Protocol

**STR**- Specialized Technology Resources

**TEMPUS** – European international Education Program

**UK**- United Kingdom

**UN-** United Nations

**UNCTAD-** United Nations Conference on Trade and Development

**UNESCO** – United Nations Educational, Scientific and Cultural Organization.

**USA-** United States of America

**USD-** United States Dollar

**USSR-** Union of Soviet Socialist Republics

**WB** – The World Bank

**WEF-** World Economic Forum

**WTO** – World Trade Organization

## INTRODUCTION

**The actuality and importance of the topic tackled. T**he analysis of the existing situation and forecast of the development of the academic and science system is directly related to the problem of the mobility of high-level specialists, candidates, and doctors of science. The study of the patterns of their movement between industries, from academic to research studies, from universities to industrial organizations, and the trajectories of movement within the borders of the country itself and/or from another country is of paramount importance to ensure the reproduction and development of the education and science system. Traditionally, degree holders pursued academic careers, working in universities or research centers. Work outside education and science was perceived as an "alternative" career path. In recent years, however, the increase numbers of degree holders have been much faster than the growth of vacancies in the academia and science institutions, making careers outside the labor market in the academia, and in industry in particular, a fairly common option. This process is characteristic not only of Israel, but also of many other developing and developed regions and countries.

An important feature of modern intellectuals is their frequent movements; even the term "scientific nomadism" has appeared to describe the "nomadic" lifestyle of scientists [127]. Historically, the migration of scholars has been a longstanding phenomenon, but in recent times global fluctuations and movements have gained prominence and attention at all levels, from government programs to individual career plans.

The international mobility of the educated population is a complex phenomenon of great importance for both the country of departure "donor country/motherland" and the "host country". World science as a whole benefit in most cases from active international mobility of scientific personnel, as more scientists are included in the process of knowledge exchange. They get the opportunity to conduct research on the topic closest to them and in the most appropriate conditions. For the global scientific community in its generalized sense, an active migration of skilled specialists is an important factor in development.

However, at the country level, the migration of skilled specialists can both improve the situation of an individual country and damage its scientific and technological potential and the very prospect of development.

The term "brain drain" was first heard in the 1960s [54] and was initially the dominant view of international mobility of scientists. This concept assumes that there is a great difference in the level of development between the donor country and the acceptor country, that the conditions for scientific work in the country of departure are much worse than in the country of entry.

This concept assumes that there is a big difference in the level of development between the

donor country and the acceptor country, that the conditions for scientific work in the country of exit are much worse than in the country of entry. It is assumed that all the negative consequences fall on the sending country (it loses the most active and educated part of the population), while all the positive ones fall on the receiving country (the influx of skilled specialists).

Brain drain is mostly considered long-term mobility (including permanent relocation), and less attention is paid to short-term mobility. It is also important to mention the concept of "brain overflow" [20], according to which active migration of scientists can be connected with their overproduction in the donor country when the number of the most talented teams produced does not correspond to the volume of demand for scientific activity. This situation is typical in Israel alongside EU countries.

The ***relevance of the current research*** derives from the proposed economic and educational national and comprehensive economic-educational model that aims to reduce the brain drain un the Israeli borders, reduce its dimension, and to reduce the number of the Israeli outbound students. The model should be budgeted by the government, in order to deal with the phenomenon in question of brain drain. Also, the thesis aims to provide an innovative outlook on various concepts and their connection to the existing reality. This requires a rethinking of the theoretical and practical approaches to assessing the effect of the Israeli brain on the labor market field, as well as offering a model for stemming this flow, since the current concept of economic development does not fully explain the impact of this flow factor, without paying sufficient attention to ways to attract Israeli to return to their home land.

Insufficient attention to the development of methodological tools for assessing brain drain`s effects on the economic development of labor markets predetermined the object and subject of the study. To be more precise, **the object of the study** is the brain drain`s Impacts of Israeli students studying abroad on the Israeli labor market in comparison with the international situation. **The subject** of the study is the social and economic relations at the national and international levels that arise in the process of training, using and moving intellectuals.

Due to the fact that over the past 50 years, the size of the global migration of qualified specialists has grown incredibly, now the “drain” is perceived as a serious threat to the future of many countries. Moreover, no matter how often the advocates of migration of professionals use more neutral terms such as “brain mobility”, “brain exchange”; a fact remains that if it is an exchange, then it is extremely unequal! In any case, the problem of studying and regulating the migration of specialists and scientific personnel objectively comes to the fore for countries of different levels of development.

Although historically Israel has a relatively rich experience in the field of import-export of

specialists and scientific personnel, we have confirmed that Israel is recently only embarking on the formation of a comprehensive scientifically-based policy of participation in world migration processes. Approximately 25% of the university's research and teaching staff had left for academic and research institutions in the USA. For comparison, we have cited data from European countries: for example, the number of departing researchers in Spain is about 1%, and in France and Germany is about 3%.

According to the radio station "Kol Israel", recently, the university staff`s number in comparison to the number of residents in the country has also been decreased by 35%. The research on the migration of intellectuals, including knowledge-based economic development, is essential for the future of Israel. Israel's focus on innovative development is one of the priority ways to overcome the crisis in the economy. Therefore, it is proposed to consider strategically promising development of a theoretical base for the formation of infrastructure to support innovations, high technologies, education, and the protection of intellectual property in accordance with global trends. Firstly, this concerns the development of a conscious competent policy in the field of international migration of intellectuals.

Israel needs to transition from a passive statement of brain drain to developed countries in a global economic scale system to create national tools for regulating the migration of intellectuals.

The study is based on the works of Israeli and foreign scientists in relation to the problems and principles of the structure and functioning of the modern world economy, the knowledge economy`s development, science, globalization of the world educational space, trends in the processes of international migration, and the world labor market.

It should be pointed out that there is a difference in the general interpretation of migration issues in national and foreign literature. Western specialists pay considerable attention to the rationale and advantages of migration of specialists to countries of different levels of development because they profit due to this kind of immigration (brain gain), while most national specialists analyze the migration losses (brain waste) of developing countries as if the fact of immigration of specialists is taken for granted [101, p. 115].

A significant contribution to the problem of labor migration of students and highly qualified specialists in the current global labor market, in understanding the global phenomenon of brain drain, as well as in developing a methodology for studying the complexity of the phenomenon discussed has been made by Israeli scientists and researchers such as: S. Ahola, J. Nurmi, P.G. Altbach, A.W. Bates, A. Brender, R. Daugelyene, E. Daulet Hnova-Bazhenova, F. Dokier, H. Rapoport, M. Green, A. Ferguson, R.S. King, W. Teichler and others.

Theoretical developments related to the place and role of science, education, and intellectual

capital in the world-system development are contained in the works of foreign authors such as S. Ahola, J. Nurmi, P.G. Altbach, A. W. Bates, A. Brender, R. Daugeliene, E. Daulet khnova – Bazhenova, F. Docquier, H. Rapoport, M. Green, A. Ferguson, R. S. King, U. Teichler, and others.

Their researches are very important for understanding the different approaches related to the problem of international migration, as they represent the assessments of the process and the role of intellectual migration.

Despite the recent increase in the number of publications on the migration of labor resources, the unity in the approaches to the migration of intellectuals to the assessment of its consequences has not been achieved. In the works of the above-mentioned authors, the attention is focused mainly on certain important aspects of the migration of intellectuals, as well as on the numerous features of this process. There is no comprehensive presentation of the migration process of intellectuals on the world economy scale.

There is a lack of theoretical development on the intellectual migration impact on the development of the world system economically and socially as a whole. Moreover, in our opinion, the theoretical discussion, in this case, is closely connected with the solution of geo-economic, military-political, and geo-cultural tasks. The approach of the world system has a powerful potential socially, due to the fact that it includes and develops ideas of the world economies. Immanuel Wallerstein developed the holistic concept in the final form. The main factors of our chosen theoretical and methodological foundation are also institutionalism, which today has a continuation in the development of evolutionary economics, and, in addition, the ideas of globalism, geo-economics, the theory of "knowledge economy", macro-sociology, and theoretical history. The characteristics of the world-system, formulated by the author based on multiply and different approaches, enable structuring the modern world economy, make it possible to analyze both global migration processes and the scientific and educational spheres, in which the study of the formation of an intellectual migration infrastructure takes a special place.

**The aim of the dissertation** research is analyzing the brain drain phenomenon in global context, as well as in the State of Israel, to identify its direct and indirect causes, the consequences of this phenomenon for the labor market in Israel, and to propose ways to overcome the problems associated with the loss of intellectuals in comparison with solutions offered by countries in global vision. The author seeks to propose a new legislative national model to overcome this problem and minimize its scale through practical steps proposed to responsible authorities and ministries in the State of Israel, along with comprehensive and specific recommendations.

Achieving this goal will lead to the establishment of theoretical principles of state policy to compensate for the negative effects on the Israeli economy.

**This goal determines the formulation and implementation of the following research objectives:**

1. to compare different definitions of migration of intellectuals and reveal its role in the development of the overall process of labor migration in global vision;

2. to identify general and specific trends in the migration of intellectuals in the modern world system;

3. to propose a classification of the factors causing the migration of the intelligentsia, with the allocation of regulated factors;

4. to develop a qualitative model of intellectual resources circulation in terms of global economy;

5. evaluate the current regulation of international migration of intellectuals and give methodological recommendations;

6. formulate the principles of state policy in the field of migration of intellectuals and give regional recommendations.

7. To review and evaluate the existing Israeli policy aims to reduce the Israeli brain drain, as well as to develop and evaluate a new policy in this regard in order to return and attract Israeli students traveling abroad after graduation, since a large percentage of departing Israeli students remain out of their origin countries after graduation for many years. for various reasons.

8. Make a map of the goals of Israeli academic students and specialists.

9. Formulate and present an innovative economic model and solutions, as well as provide innovative recommendations to the Ministry of Education and related ministries in the state of Israel, which are aimed at reducing the brain drain demand and academic mobility, and minimize its dimensions.

Such model, principles, and legislative policies constitute a scientific novelty and originality since the process include a sequence of steps, techniques, and strategies to reach an overall and comprehensive solution and to produce groundbreaking and unusual new ideas, combinations, and concrete, practical, useful, appropriate, and valuable meanings in the given context, what will reduce even partly the demand for studying or working abroad.

The research problem derives from the growing imbalance of the world system caused by the uneven concentration of specialists due to the undeveloped methods of accounting for the migration of intellectuals and the lack of approaches to regulating migration at the national level.

Actually, this problem lies in the negative influence of worldwide macro and globalization processes on to the academic and economic areas in Israel. The current study shall present a national problem of non-professional management in the academic establishment in Israel, what

affects the economic and employments fields. Currently this problem preoccupies the senior Israeli academic system, Council of Higher Education (CHE) in Israel, and related authorities that attempts to deal with and overcome the losses caused by the phenomenon of brain drain and academic mobility.

The value of the solution in the proposed research refers into three central aspects:

1. The level of academic mobility demand of Israeli academic students.

2. Actual work and collaboration between the related bodies- Ministries and authorities (Annex No`41).

3. The model should enable on the one hand a brain drain forecast, and on the other hand, taking active steps to prevent them from the drain, and to minimize this trend through massive treatment and solutions (Annex No`42).

**The theoretical significance of the study is:**

1. regularities and tendencies characterizing migration flows and their supporting infrastructure have been clarified, as well as some regulators by intellectual migration processes, presented in homeostatic-type models, that make it possible to expand the theoretical possibilities for analyzing the world system;

2. conceptual foundations of intellectual migration have been formed, opening up additional theoretical possibilities in the field of geo-economics and global studies to develop a weighted policy in the sphere of migration of highly qualified specialists.

**The practical significance of the study is:**

1. The theoretical foundations of the global problem of migration of intellectuals, as well as qualitative models expressing the main trends and conditions in the field of international migration of specialists developed in the dissertation, are used in the educational process in Israel.

2. Development of international educational programs, under the auspices of the Ministry of Economy of the Government of Israel, designed to extend joint programs with foreign partner universities to the Israeli educational institutions;

3. The main provisions and conclusions of the study can be used by regional and federal departments, including commercial, educational and public organizations in solving the problems of Israel's economic security, preserving its intellectual potential.

4. The results of the study can be used in formulating Israeli development strategy, in terms of determining measures to prevent the outflow of Israeli professional resources, and in developing marketing strategies.

**Hypothesis of research.** The main factors for the academic mobility and brain drain in Israel are:

- Economically, there are expensive living expenses and taxes.

- Occupationally- the high rate of unemployment, the poor pay, and the search for better jobs and professional prospects.

- Educationally- there are many barriers in the educational system, and the Israeli institutions have strict admission standards, which has caused Israeli students to search for decent or better education outside of Israeli boundaries.

- As well as other options- like moving to a country with higher living standards.

**Synthesis of the research methodology and justification of the chosen research methods;**

The theoretical and methodological basis of the study. The works of classical authors of economic theory, leading national and foreign scientists representing various directions and schools of economic thought including political economy, institutionalism, world-systems analysis, macro-sociology, the theory of "knowledge economy", global studies, and geo-economics. In methodological terms, the dissertation research is based on analysis and synthesis, the dialectical method, a combination of historical and logical comprehensive systematic approaches, methods of comparative cross-country analysis, economic and statistical methods, categorical symbolic, and categorical circuit design tools for systems containing an internal contradiction.

Information base to ensure the validity of the conclusions consists of monographic publications and periodicals, legislative and regulatory acts, programs, forecasts, analytical and conceptual materials; speeches of scientific leaders; official statistical and analytical materials of national and foreign databases, including the Israeli Academy of Sciences, the International Labor Organization (ILO), the World Bank, the World Economic Forum, the International Organization for Migration (IOM), the Organization for Economic Cooperation and Development (OECD), and the World Trade Organization (WTO), as well as the author's developments obtained in this scientific process.

In the proposed research the following methods and tools of scientific research were used: the documentary method which is based on general and professional bibliographic sources analysis, the synthesis method used to establish the links between the phenomena studied, the systemic method of analysis, quantitative analysis methods and mathematical and statistical tools, graphical methods of data representation, comparative tables and financial analysis of various sources.

These sources enable the researcher to provide a general review and to give the most recent, fundamental, and updated information on the academic migration and brain drain trends.

In the second chapter (sub-chapter 2.2.), the author presented the results of statistical tests that have been used, the use of elements of data analysis such as the Pearson Correlation Model, and the regression model. Actually, the research's main hypothesis was that there are primary causes and factors that have an effect on Israeli students' decisions and brain drain and, consequently, have an impact on the Israeli labor market, and by assuming that the relationship between the two parameters is linear - linear model - the straight line equation (Y=ax +b) can be used as a mathematical method in order to analyze and locate the connection between the independent variable X and the dependent variable Y, where`s the independent variable explains the dependent variable. By using and analyzing the linear model, the Pearson Correlation Model, and the regression model, the main causes/explanatory variables which lead to the academic mobility and brain drain will be determined. Then, the regression model was translated into an innovative economic model and solutions for the circulation of intellectual resources, formulating principles of state policy in the sphere of migration of intellectuals, providing methodological recommendations for the implementation of the model, and dealing with the discussed problem, and providing innovative recommendations to the Ministry of Education and related Ministries in the state of Israel, which aim to reduce the demand for brain drain and academic mobility, and reducing its scope.

After collecting and analyzing these related data, the researcher aims to provide conclusions and recommendations to the Ministry of education in Israel, which contain all the elements and tools that are required and necessary for dealing with the phenomenon. Actually, the proposed research analyzes and deals with the discussed phenomenon in a national and global vision by making a comparative analysis of the phenomenon in core countries world-wide in parallel to the situation in Israel.

Approbation of the results of the research. The main results and recommendations of the work are outlined in several publications, monographs, theses, articles, and publications in Europe.

The logic and structure of the work are determined by the aim and objectives of the study. The thesis consists of an introduction, three chapters, general conclusions and recommendations, and 238 bibliographic Sources.

**The first Chapter** "*Theoretical aspects of the effects of the Israeli brain drain on the national labor market with comparison to the worldwide situation*" examines the social and economic aspects of the development of migration processes. It shows the importance of intellectual migration not only for the Israeli market, but also for the modern world economic system as a whole. This chapter reveals the conditions of the modern labor market and its impact on the migration of highly qualified specialists; ehe role of Israeli scientists in the production and

implementation of scientific knowledge, including the results of academic research and development, is also shown.

The model of the world economic migration of intellectuals is presented, which makes it possible to identify the specificity of the Israeli situation within the framework of the problem formulated

At the end of the first chapter, in light of the professional literature, reviews, statistics, studies, and the findings presented in the subchapters of the first chapter, conclusions are presented both internationally and locally, whilst providing a preliminary picture of the worldwide changes which have occurred as a result of the development of the academic zone, of the implications of the globalization, of the worldwide demographic changes, and of the macro-economic influences.

**The second Chapter** "*An analysis of the Israeli brain drain and influences on the Israeli labor market in comparison to the international situation"* focuses on an analysis of the influences of the brain drain phenomenon on the labor market in the state of Israel, with comparison to the international situation. This chapter provides and indicates the influences which had changed the needs and preferences of the Israeli higher education students and the brain drain of intellectuals and the way in which they perceive the system of higher education. Also, it indicates the future consequences of the Israeli brain drain and academic mobility in a period of seven years (2015-2021), and an analysis of statistical data and measures of the phenomenon. This chapter also examines and expresses parallel analyzes, solutions, and strategies in this regard in well-known and core world-wide countries. The chapter ends with conclusions of the statistical data and measures.

The chapter also discusses the brain drain phenomenon and its serious negative effects in the Republic of Moldova especially due to the fact that the state of Moldova is a developing country and relatively small. If so, the Republic of Moldova should develop effective rules, policies, and strategies for managing the migration of highly skilled Moldavians.

**The third Chapter** "*Ways of Israel`s struggle with the "brain drain" from the country in comparison with countries of the world, and recommendations for improving the system*" focuses on the treatments and policies the State of Israel adopted in order to deal with the phenomenon, with comparison to world-wide countries- Policies and solutions. It’s clear that in the state of Israel, there is no current actual treatment in this regard. Then, an initial and innovative economic model is presented, which indicates the most significant factors, elements, and authorities related to the operation and implementation of the model, and the suggested solutions, steps, and responsibilities of each authority.

The author also provides examples of different countries which successfully dealt with this

phenomenon. Regarding the Republic of Moldova, the author recommends developing effective rules for managing high-skilled immigration, and suggests offering and implementing the model developed by the author aims to deal with the Israeli brain drain to the responsible bodies in the Republic of Moldova after making the required changes and adjustments, for dealing with and minimizing the dimensions of the brain drain in Moldova, and it`s negative effects.

**The conclusions and recommendations**. The conclusions summarize the research's main findings and results, and the author reaches a conclusion that the lack of treatment in this regard is leading to greater brain drain and its negative educational, social, economic and occupational implications. If so, the author develops an initial model and states recommendations and policies to deal with and minimize the dimension of the discussed phenomenon. The proposed model and recommendations enable theoretical, applicable, and practical solutions and coping, and require genuine and proper cooperation and connection with the government, different ministries, and related bodies in order to deal successfully with the phenomenon from the economical, commercial, cultural, industrial, and occupational aspects.

Such a model can be adopted and implemented in countries world-wide in the discussed regard, with a focus on the republic of Moldova.

**Keywords:** Brain Drain and intellectuals' migration, Academic Mobility, Higher Education and academic demand, employment and Labor market, Academic studies and R&D Outputs, Economic-Academic model.

# 1. THEORETICAL ASPECTS OF THE EFFECTS OF THE ISRAELI BRAIN DRAIN ON THE NATIONAL LABOR MARKET WITH COMPARISON TO THE WORLDWIDE SITUATION

## 1.1. The International Migration and the Peculiarities of Migration of Intellectuals

Today in the scientific literature, one can encounter a considerable number of different interpretations of the concept of "migration", accompanied by numerous clarifications: seasonal, temporary, permanent, irrevocable, forced, economic, rural, urban, international, etc. In the text of the migration program for 1998-2018, the following definition is given: "Migration is the movement for various reasons of individuals spanning borders of different territorial entities in order to permanently or temporarily change their place of residence." Speaking about international migration, most often there are three main types of it: irrevocable (resettlement, permanent), seasonal and circular [3, 57]. It should be borne in mind that each of these types of migration could be legal and illegal, be voluntary or forced. It makes sense to rely on the basic definition of international migration, given by one of the leading experts on this issue: worldwide migration of the population "represents the territorial cross-border movement of people associated with changes in permanent residence and citizenship due to personal factors (family, national, political and other), or with a stay in the country of entry, having a long-term (more than 1 year), the seasonal or circular character" [107, p. 51].

The international labor market is a system of relations that develops between states regarding the matching of the demand with the supply of labor force, regulation of its interstate flows, remuneration, and social protection in the context of the trans nationalization of national economies. These relations arise due to the uneven distribution of capital and human resources in countries world-wide and with differences in their reproduction at the national level [42, p. 846]. With the deepening of globalization processes in the world economy, which are manifested in the growing interdependence of countries and their regional groupings, nationwide labor markets, as well as markets of goods, the market of services, and capital markets, increasingly lose their insularity and isolation, which leads to the formation of the so-called common labor market [22].

The formation of the international labor market takes place in two different ways: first, by the migration of labor and capital and, second, through the gradual merging of domestic labor marketplaces, which results in eliminating legal, ethnic, cultural, and other barriers between them. The formation and development of the international labor market is evidence that the integration processes now do not only encompass the economic and technological spheres but more and more dynamically draw social and labor relations into their orbit, which also acquire global characteristics. The forms of manifestation of the globalization of social and labor relations:

strengthening the social orientation of the world economy [42, p. 861];

- democratization of labor relations;
- internationalization of requirements for labor force reproduction;
- standardization of the employment and living conditions of people in different countries;
- coordination, adjustment and rapprochement of the social policies of the states of the world.

The second interpretation is supported in the USA. It was in this country that the category "minds" appeared for the first time in the statistical reports of the late 40s, and gradually during the latter part of the 20th century [2, p. 176]. All the above-mentioned groups were excluded from this category in America, except for scientists and highly accomplished experts, mainly in the sphere of natural, technical sciences, economics, and psychology. This, again, conditionally, the "narrow" interpretation probably reflects the desire of the authorities of the world's richest country to isolate and attract just these representatives of the world intellectual elite [9, p. 181].

In poor countries, most often losing trained specialists at various levels, they mostly adhere to the "broad" interpretation of the term of brain drain. The emphasis is made on financial losses from irretrievable migration that accompany the emigration of educated professionals of any level of training. Here it is important to avoid extremes since too broad an interpretation can substantially blur the boundaries of the concept of "minds" [56, p. 38]. If it includes, as is often done, paramedical personnel, in particular, nurses, it is not entirely clear why for this reason highly qualified personnel, equipment adjusters, operators, etc. cannot be included. All of them, as well as representatives of many other professions that require both knowledge and skills, and certain physical efforts, have intellect [12, 45, 57].

In our opinion, one of the options for resolving terminological disputes could be the use of the following semantic division: - "migration of intellectuals", which includes representatives of mental, creative work, including scientists, writers, artists, musicians, even religious thinkers, as well as potential specialists represented by students, graduate students, which in general can be defined as an intellectual elite, relying in labor activity on the capabilities of one's mind and talent [64]; - "brain drain", in turn, does not only the above-mentioned group but also qualified specialists in general, encompassing the average technical, medical personnel, etc. These are those who, making up an educated part of society, sometimes combine intellectual exercises with elements of effort that require established skills, even physical ability [63].

The author is primarily interested in the migration of scientists, students, thinkers, specialists of higher qualifications, without representatives of the artistic (creative) intelligentsia, as well as

skilled middle-level personnel. Therefore, by applying the concepts of "migration of intellectuals", "the emigration of specialists", "brain drain", etc., we will keep in mind, in essence, and, above all, international movements of scientists, teachers of the higher institution, specialists of the highest qualification, i.e. [40, p. 22].

| **labor migration qualified resources** | **Workforce** | **brain drain** | **migration of intellectuals** |
|---|---|---|---|
| Israeli labor and skilled personnel | medium-level specialists (technicians, nurses, operators, etc.) | | |
| | creative specialists (writers, composers, musicians, artists, etc.) | creative specialists (writers, composers, musicians, artists, etc.) | partial |
| | potential specialists (students, master students, doctoral students, etc.) | potential specialists (students, master students, doctoral students, etc.) | partial |
| | scientists, teachers (exact sciences, humanities) | scientists, teachers (exact sciences, humanities) | almost total |

**Fig. 1.1. Highlighting the concept of "Migration of Intellectuals" in the system in terms of the international migration of labor force, specialists, and scientists**

Source: Made by the author from source [3, 26, p. 209, 43, p. 218, 61, p. 34, 70, p. 8, 147, p. 12]

According to figure 1.1., the workforce consists of skilled workers, medium-level specialists, creative specialists, potential specialists, scientists, teachers, and others. While the brain drain of creative specialists and potential specialists is partial, the scientists brain drain is almost total. Actually, intellectuals as a special labor resource formed by holders of fundamental knowledge, who make the greatest contribution to the innovation component of scientific and technological progress.

Historically, the beginning of the migration of intellectuals in the global migration process is determined by us from the moment of the development of civilized forms of human society [52, p. 484].

The increase in international capital mobility associated with the internationalization of the economy in social terms means that capital makes demand not only for the labor force of its home country but also for foreign labor, which often has certain advantages over the national. The demand for foreign labor force began to grow noticeably when the export of private productive capital acquired significant proportions through the creation of enterprises in all countries using the local labor force [58, p. 552].

History has offered us many vivid examples of early migrations of intellectuals, which were

based on negative impulses. Actually, “forced vagrancy was the lot of scientists in many epochs” [64]- **Annex No' 6**.

Since ancient times, thinkers, philosophers, and scientists have been subjected to forcible expulsion. The reasons, for all their diversity, most often lay in the relationship of intellectuals with the authorities or society. Actually, the names of people expelled by citizens and rulers in different periods, from different countries were preserved in history. Thinkers, even entire scientific schools, have been victims of military, political, and religious cataclysms from the earliest times [51, p. 60].

Another vivid example of the centuries-old persecution of the intellectual elite is the migration of Jewish thinkers under pressure from pagan, Christian, and Muslim authorities and peoples. In different epochs, after another exile settling in ancient Babylon, in Arab Spain, Germany, and Russia the new time, Jewish communities put forward outstanding thinkers, philosophers, and scholars [35, p. 103].

It is known that in the difficult conditions of emigration, in order to survive, scientists tried to consolidate. Academic groups were established in Bulgaria, Great Britain, Germany, Italy, Poland, Sweden, Switzerland, Finland, France, Czechoslovakia, Estonia, Yugoslavia, Manchuria, and the United States. In the 1920s -1930s, several congresses of the Union of Academic Organizations took place, which allowed not only to coordinate organizational efforts but also to actively develop scientific activities [113, p. 48].

In the 1920s, Germany saw a remarkable boost in culture; Berlin was the capital of world science. By 1930, German physicists and chemists had received 21 Nobel Prizes out of 671. In total, from 1901 to 1933, 33 Nobel Prizes out of 100 were awarded to German scientists in all branches of science, while 18 prizes were awarded to British scientists and only 6 of them were awarded to American scientists [5].

In fact, the migration of intellectuals from its inception until about the middle of the 20th century developed, in our opinion, mostly under the impact of various forms of pressure, violence, and other negative circumstances, corresponding with the patterns of international migration in general. However, in the latter part of the 20th century, the intensification of factors associated with the active and purposeful attraction of intellectuals to developed countries became increasingly noticeable. In other words, the effect of the “stick” began to yield to the effect of the “carrot” [57].

This policy has been consistently followed by countries that since the 1990s have taken a course on the active involvement of foreign experts. These countries primarily are Australia, Canada, and New Zealand.

Besides already having attractive programs for immigrants, since 2002, Canada has seriously liberalized its policy in this regard, mainly with regard to professionals. Just as in Australia and New Zealand, special government programs of professional (independent) immigration are being implemented in Canada, designed to attract from other countries, the representatives of professions that are deficient in the local labor market. The selection of candidates is based on a system of points, which are awarded primarily for education, profession, work experience, and knowledge of the language. Moreover, in Canada, unlike in Australia and New Zealand, the rule of compulsory passing the language exam is not applied. The Canadian government itself spends 140-160 million dollars annually to develop language-training programs for immigrants [37].

In addition to the federal program in Canada, there are several immigration programs in individual provinces - Quebec, Manitoba, British Columbia, Alberta, and others. The purpose of the Quebec province program, for example, was to attract 44 thousand immigrants in 2005, 46 thousand - in 2006, and 48 thousand in 2007 [33].

Canadian authorities also have a program to attract future professionals. In accordance with it, students in Asia and South America are recruited to study in the Country of the Maple Leaf. To achieve this, since about the mid-1990s, special foreign centers have been opened. The federal government provided a grant of $ 25 million, which expires in 2020 [143, p. 36].

In 2004 the same consistently operating Australian government announced a new immigration project, according to which it was planned to increase the influx of professional immigrants by 10,000 people annually during 2005-2006. For this purpose, a new visa was offered - a temporary regional independent migration visa for qualified workers, providing applicants with temporary residence in Australia for 3 years. After 2 years, they can apply for the right of permanent residence. The system of points in the country, the sum of which should be equal to 120, is clearly targeted at highly educated personnel; up to 60 points can be obtained for education, up to 10 for professional experience, and from 10 to 15 for specialty enjoying increased demand on the Australian labor market. Thus, from 120 points to 85 can be gained due to the high degree of qualification [73, p. 223].

Here, the same as in Canada, programs are being introduced by the authorities of individual states to attract specialists from other countries. The authorities in Victoria allocate $ 6 million to increase the influx of immigrants. This program allows them to increase the flow of skilled personnel by about 25% annually [114, p. 14].

The results of this policy are obvious - 60% of immigrants have exactly the knowledge and skills that the country's economy needs. The website of the World Economic Forum emphasizes that the specialists who immigrated to Australia during the recent years have increased the

country's GDP per capita by 350 Australian dollars, and if the existing immigration legislation is valid for the next 20 years, then the contribution of the immigrants to Australia's GDP can reach 127 billion Australian dollars [56, p. 38].

The immigration policy of New Zealand is very close to the Australian one in its orientation and character. The points for qualification amount to 2/3 of the total amount required to obtain the right to permanent residence [57, 202].

Almost without paying attention to special programs, the authorities of the United States are also very active. They rely on their already very attractive conditions for living and practicing scientific activities. The country's requirement for highly qualified professionals is so high that the Nobel laureate Gary Becker recently suggested revising the immigration quotas of 1965 and accepting foreign specialists in unlimited amounts, stressing: “America really depends much on the foreign labor force, especially scientists and engineering technical staff. This is a fact one cannot escape from” [134, p. 168].

In the year 2000, American employers, leading a real war for increasing immigration quotas, won it - under the new law, up to 200,000 professionals can come to America every year. At the same time, periodically there is an acute shortage of specialists, which in the field of computer-information technologies alone amounts to about 400,000 people. The industrial group Computing Technology Industry Association has conducted a detailed study, and calculated that the shortage of computer scientists costs the US economy a total of $ 4.5 billion annually [14, p. 191]. Nevertheless, more than 2 million qualified foreign programmers, computer engineers, etc. work in the companies of Silicon Valley alone. A study conducted in the late 1990s in the USA revealed striking data that 60% of American authors of the most cited works in physics and 30% in other natural sciences had foreign origins. Approximately 25% of the founders and presidents of biotech companies were foreigners [134, p. 169].

In the early 2000s, the attitude to the problem of attracting foreign specialists to Europe obviously changed. Germany, Great Britain, France, and other countries, partly adopting the Canadian and American experience, developed and introduced their own programs. However, the trend towards an increase in the share of highly qualified workers in the overall structure of immigration started in Western Europe even under the conditions of immigration restrictions in the 1980s and 1990s, when the admission of foreign workers was minimized [21, 22]. Thus, in France from 1982 to 1990 the number of foreign specialists increased by 81.5%, while other categories of foreign workers — only by 0.8%. Today, in France and the UK, a high-level procedure for issuing work permits has been introduced for highly qualified specialists, and their number is increasing [123].

The need for Western European countries for specialists, especially of computer profile, is extremely high. According to the officials, the computer sector of the German Federal Republic currently lacks 75 thousand employees, and in the coming years, the demand may increase to 200, 000. Ten years ago, there were only 15%.

In general, in the Western European Information Technology (IT) sector, according to the head of the European Union Romano Prodi, for 2003 the number of vacancies has doubled since 2001, rising from 1.9 million to 3.8 million. The European leader was forced to demand from the governments of the EU countries a "coordinated and open immigration policy" [218, 219].

Germany, most acutely experiencing the shortage of trained personnel, was the first in Western Europe to launch a program to actively attract computer specialists. Chancellor Gerhard Schroeder at a meeting with programmers of the famous Bangalore openly stated that he was going to compete with the United States in the hunt for "the best Indian brains" [69, p. 204].

Moreover, in May 2004, despite a rather high level of unemployment, for the first time in the last few decades, Germany decided to open its doors wide to foreign specialists from non-European countries. There was simply no other way out - in the conditions of the transition of the German Federal Republic from the industrial society to the information sector, the IT sector must play a key role, become the engine of the entire economy. This is evidenced by the growth rate of the industry. In Germany, in 1999 about 2.5 billion German marks were invested in the development of the Internet in the country, in the year 2000 the volume of investments rose to 52 billion, and in 2004, comparable prices accounted for about 700 billion USD [69, 177].

After Germany, Ireland announced the start of special programs to draw in computer professionals, followed by France and the United Kingdom. The latter directly called its program, launched in 2002, the “Highly Skilled Migrant Program (HSMP) Program for Attracting Highly Qualified Migrants” [123, 191]- **Annex No' 2**.

In 2003, Britain significantly reduced the minimum number of points required for permitting immigration. It should be emphasized that the need for professionals is so acute that knowledge of the English language has ceased to be a requirement for immigrants in this program. Moreover, the program provides for the expansion of the network of English language courses, mainly in order to accelerate the assimilation of immigrants. As the Minister of Internal Affairs of Great Britain Beverly Hughes, who actually voiced the country's state policy regarding the employment of foreign specialists, emphasized: “We must encourage the attraction of labor force from abroad in order to make our economy grow and prosper”. This direct linkage leaves no doubt that the developed countries will do everything in their power for the most active "absorption" of professionals from all over the world [128, p. 779]. Moreover, according to the estimates of the

representatives of large Western management, competition for the "minds" between developed countries is growing. Thus, we distinguish the historical different forms of international migration of intellectuals, first, under the influence of violent, negative factors, which prevailed in the past, and second, which gained weight throughout the latter part of the 20th century and is determined by the active attractive policies of developed countries, with their substantial differences, are still very close in absence of real freedom to choose a place of residence and the activities of specialists who are forced to migrate either by force or under the pressure of their own problems and attractiveness of conditions of foreign countries that "buy" foreign professionals primarily for their own, national-state purposes [143, p. 33].

It is likely that on a disproportionately smaller scale than the first two types, a migration of scientists and specialists is occurring or should be occurring, which can be conditionally defined as "free", that is, free from the prevailing factors of compulsion, any external pressure, everything else except the personal decision of a specialist associated with his scientific interests, his love for specific landscapes, his tendency to live in certain natural and climatic conditions, or, let us say, to the cuisine of a particular country, etc. [143, p. 39].

Presumably, such a migration option for scientists and specialists may be the transfer of foreign personnel from the centers of world economic economics, with their most attractive conditions for work and life, to countries of the lower level of development, often back to their homeland. So, experts note that in recent decades, there has been a slight but increasing return migration from the USA (not from Europe), mainly to South Korea and Taiwan, which is mainly due to the rapid economic growth in this region. The fact that they have not broken their ties with the USA suggests a considerable degree of freedom of choice for these people: the majority of them still have business interests there. The wealthiest specialists even donate funds to their Alma mater, as there was the case with graduates of the University of Berkeley, who sent tens of millions of dollars to their university from Taiwan. Often, the Chinese nuclear scientists, who after a protracted residence in the USA came back to the PRC and are effectively working on its defense, are cited as an example. In the mid-1990s, about 200 thousand foreign Americans left the USA annually, a considerable part of them were professionals. In total, 1/3 of all immigrants left America, and 20% - throughout the initial ten years of their residence in the country [133, p. 68, 134, p. 166].

If we bear in mind that a significant part of the specialists, under certain acceptable or other equal conditions, would like to work in their nation of origin, afterwards the programs of international or intergovernmental organizations to facilitate the return of intellectuals to their home also support the conditionally "free" migration option. Thus, the European Commission

initiated several programs aimed at attracting specialists who emigrated from Central and Eastern Europe and returned to their native nations by offering attractive employment opportunities. With any approach to the assessment of such a fact, we should recognize the existence of a choice, which means -freedom. In fact, everyone should have a personal and free choice, the possibility and opportunity to work abroad, but not out of despair [151, p. 322].

And without any doubts, this "free" migration of specialists can be attributed to their transfer from one developed nation to the next nation, when it is not the matter of emigration, how to survive, save a family, and get decent working conditions, but only about getting a better environment for professional growth and academic career. It was in this shape that the brain drain initially acquired significant proportions in the 20th century, when at the turn of the 1940s – 1950s talented scientists and graduates of European universities, usually youngsters, who were focused on research and education, rushed overseas to research centers in the United State of America, Australia and Canada. In the period between 1950 and 1960, about 100 thousand highly accomplished experts arrived in the USA from Great Britain, Germany, Italy, and France [133, p. 67, 151, p. 317].

Of course, in this case, economic reasons - the desire to live better, etc. cannot be excluded from the decision-making factors, however, we are not talking about escape from poverty and humiliation, and not about recruiting according to specially prepared programs for "absorbing" foreign specialists. The readiness of 52% of British people to go abroad can only be interpreted by a free choice, as the economy of this richest country has been developing stably throughout the recent years, and problems in the fields of public transport and health are cited as reasons for the alleged departure. Thoroughly tracking the nuances, British scientists found out that in the early 2000s, local professionals began to move more and more from the south of the country to the northern cities of the United Kingdom, and the main reason is relatively higher growth in housing prices in the southern counties compared with the northern ones [128, p. 779].

Sometimes researchers are not even able to give specific reasons for the migration of specialists and scientists to other countries, and this is an option of "free" migration. "German scientists like to work under a contract in Canada or somewhere in Africa, Canadians seek to get a "position" at universities in the USA, Americans have a lot of internships in Europe ...", etc. [158, p. 312].

Thus, as in our general pattern of migration, when up to the 15-17th centuries the reasons related to the phenomena of violence, invasions, persecutions, etc., absolutely prevailed in the migration of the population, since ancient times the migration of intellectuals has also been determined by adverse political and military events, in other words - "negative reasons for

pushing". For thinkers, the transition to the migration period, in which direct violence or its threat no longer dominates, began in the latter part of the 20th century, when the governments of developed countries purposefully began (to an ever-increasing degree) to attract professionals from abroad. This period can be defined as the time of "positive causes of attraction". Both at the first and at the second stage, scientists and specialists, submitting to powerful actions, were forced to migrate mainly by the will of external circumstances, negative or positive [157, p. 30].

World-wide labor movement is primarily due to economic factors [157, p. 143, 158, p. 216]:

• firstly, the action of the law of capital accumulation, the law of capitalist population, and the law of uneven countries' economic development, etc., cause a disproportion in the distribution of the human resource in the marginal and regional dimensions of the world economy, i.e., a relative overpopulation in some countries and a shortage of labor force in others;

• secondly, significant differences in country indicators regarding living standards and working and business conditions and circumstances, etc.;

• thirdly, the cyclical nature of global economic development, in particular, the asynchrony of the economic **cycle** in different countries;

• fourthly, asymmetry of information resource development, uneven deployment of technological and scientific revolution, and structural crises. In addition, world-wide labor movement is due to non-economic elements: political, military, ethnic, etc.

Objective opportunities for private capital to attract the labor force of various nationalities associated with the development of TNCs enabled the launching of large-scale international production with a hierarchical division of labor of various groups of employees who, living and working in different countries, integrated into a single production and technological system of a private corporation. Over time, TNCs formed their domestic (internal) labor market, which is characterized by the permanent migration of various categories of workers (especially managers) from one country to another. According to the UNCTAD report on foreign direct investment, in 2018, TNCs provided about 53 million people with jobs abroad [180, 228].

Along with these predominant options, it is possible to denote infrequent, sometimes isolated facts of the migration of intellectuals based on their own decision, or the choice of relatively close, comparable opportunities. This option can be conventionally defined as “free migration”, examples of which can often be encountered in the last decade of the 20th century, one can imagine this migration option as having serious prospects, only in case of a change in attitudes toward scientists and science on the part of those who determine the development of states and economies. One can try to determine to what extent it is possible, having considered the place of migration, in particular, the migration of intellectuals, in the modern world system [59, p. 486].

### 1.2. Brain Drain in the Global Economic System, and the Model of Global Flow of Highly Qualified Experts

The brain drain of experts, academics, researchers, and highly qualified professionals, was noticeable in the scientific global community in the middle of the 20th century, alongside the emigration of British scientists to the USA. If so, lots were interested in this regard, and many researchers wrote and researched in this context, so that between the years 1960s – 1990s over a thousand publications in English and French were researched and published. In Israel, brain drain publications were about two hundred in the late 20th century and the beginning of the 21st century [3, 14, p. 194].

Leading publications in this regard were written by [ S. Adler, T. Ariav, D. Ben -David, A. Castro – Cohen, Y. Cohen, E. Gold, O. Mohav, S. Guri – Rosenblit, K. Hag-Yahya, H. Ara, L. Ian S, L. Kesselman, J. Somech, F. Kost, Y. Gabai, F. Kost,P. Levy, G. London, S. Samff, A. Menin, T. Ron, A. Shemes, N. Rotem, Z. Halkalai, N. Teschner, E. Zered, N. Zusman et – al].

However, despite the continuing emergence of numerous publications, there is no consensus on the consequences of the outflow of highly qualified personnel due to the specifics of the problem in developed and developing countries. The main statement with which most researchers agree is that the "brain drain" from Israel is inherently an extremely negative phenomenon for the development of the country and its place in the world community. Further consideration of the problem, in our opinion, requires approaches that would present the picture of the migration of scientists and professionals as a component of the global world system [28, p. 241, 70, p. 15].

But still, despite the growing number of publications, due to the specificity of the problem in developed and developing countries, there was no consensus and unity regarding the consequences of the outflow of highly qualified personnel. The main statement, most researchers concur, is that the “brain drain” from Israel is fundamentally very negative phenomena for the advancement of the country and for its place in the international community. Additionally, we believe that a complete analysis of the issue requires methodologies that might support the idea that the movement of scientists and professionals could be seen as a part of the global world system.

In the concept of “globalization”, migration is a result of multiple factors in different contexts: economically, academically-scientifically, occupationally, environmentally, politically, socially, stability, and commercially [125, p. 14]. At the same time, the 1970s are the years of the 20th century, or perhaps the 15th and 16th centuries, when Europe developed the international system, when the system of ties between nations transformed into a dense network of linkages

with constant mutual effect of "trade and transport relations", which later affected the field of movements and outflow studies including the problems of these outflows- “migration-ology” [103, p. 505].

We should describe the basic principles of the worldwide system, assess the development trends, and consider the status of science and scientists in the system in order to be able to assess the place of the outflow in the modern world and the purpose of intellectual mobility and its impact [113, p. 57].

After the loss of relevance of the "modernization" theories, given that it is a development and continuation of the ideas of the modern world economy and the holistic concept, the author believes the "world-system" approach to be more authoritative and potentially fruitful [10, p. 49, 28]. The "world system" approach is based on an analysis of the degree and type of the economic development of groups, countries, and regions that are almost at the same level of development as the respective "social systems". Actually, the global system of capitalism changes cyclically and is affected by all kinds of factors: birth - boom - crisis, regression, deployment, stagnation, or growth. Regarding Israel, which was a part of the capitalist global system in the 18th century, the author thinks that it is a classic example of a semi-periphery since it simultaneously combines characteristics of the core and the periphery [104, p. 35].

Recently, the global capitalist economic system approached its development and progress, whether in the expansion of political rights or in the redistribution of wealth. Actually, between 1967 and 1973, the crisis phase first emerged, until the intensification of the struggle regarding the hegemonic role at the center of the world system. In fact, the authors already see the exhaustion of the capitalist world with a system of resources of development, and there are already prominent indicators of the global system's collapse as a civilization [18]. It is important to note that the same facts in a more subtle interpretation and wording have been confirmed in the post-economic society theory [121, p. 19].

Mainly, after 1945, the change of the world system manifested mainly in the expansion of the capitalist economy together with the university system and the rise of the USA led to an ambiguity regarding the distinctions among several scientific fields, including economics, sociology and political science and other scientific fields. This strengthened the institutionalization of some fields in science that are comparable to corporate organizations, etc. [73, p. 217]. It is important to note that research funding is carried out on the basis of amounts allocated to the relevant science and/or to the group of relevant sciences - a specific sum for each sub-field (economics, sociology, etc...) In fact, it is a dictatorship that piercing into the principles and rules of the research-scientific field, which separates the scientific branches that are close to a natural

convergence, making it challenging and difficult to pinpoint the causes of the various phenomena and prevents us from reaching the truth [106, p. 63].

According to works in this regard, Quantitative criteria for evaluating scientific outcomes are becoming a potential objective criterion as a result of the growing transfer to the scientific industry, and specialists justified in scientific directions increase their publications and their conferences and are more likely to receive grants. It was noticeable in the1960s that the total number of scientific articles published doubled almost every ten years, and this was a trend of continuity [49, p. 11].

In fact, with an appeal to financial efficiency, the science`s virtualization and the continuation of professionalization and institutionalization created a crisis in the legitimacy of knowledge and the advancement of man. We are driven by a desire for profitable knowledge, while there is a separation between science and truth [154, p. 4].

At the end of the 19th century, the emigration theory, and the so-called "laws of migration" emphasized that the scope of immigration has increased mainly due to the developed transportation and industry, while economic factors were the main reasons for immigration [57].

The migration of scientists was found and is still found in all ages - the ancient, the middle, and the new ages. However, in all periods, the reasons for the migration of intellectuals were determined by the aspects of the development of science, the uniformity/lack of uniformity in the promotion of scientific institutions, and the tendency to obtain advanced knowledge. As for Israel, the foundations of academic science were shaped mainly by immigrant scientists from Germany [125, p. 14].

From the 20th century, driven by economic motives by the scientists themselves and/or by measures and orders from the central countries. In 1965, US President L. Johnson formulated an initiative of priorities for attracting foreign scientists that were expressed in legislation in several developed countries [40, p. 21].

The core of the global system operates according to the Stolper-Samuelson theory, so during liberalization and trade relations, countries with a skilled and talented labor force experienced a drop in prices for goods whose production is carried out by unskilled workers, which leads to an increase in the demand for skilled workers and consequently to an increase in their wages. This is expressed, especially among those dealing with brain drain problems, in a policy aimed at attracting those who are particularly talented in fields such as mathematics and science. For example, according to the Council for the Competitiveness of the United States, until 2010 they were employed in America only 500 thousand scientists and experts from Eastern Europe and the Commonwealth of Nations.

In fact, transnational corporations have a great influence on immigration and especially the immigration of scientists, and if there is a change in the interests of TNCs, the immigrants change direction accordingly [42, p. 842].

Talented students as much as specialists are sought after by foreign companies. According to an Israeli survey held at Israeli universities and academic institutions, near about 7% of outflow, students received offers for working in foreign companies. Unfortunately, almost 25% of the annual mathematicians from the prestige Israeli academic institutions and universities immigrate out of the Israeli borders for work. On the other hand, up to 40% of foreign specialists studying in US academic institutions and universities stay in the US after graduation and don't go back to their homelands [40, p. 23].

According to American studies, over the later decades, the US budget earned almost 200,000 USD due to the immigration of highly qualified specialists. This is somehow the same as the number of funds received in accordance with the requirements of American immigration legislation for wealthy immigrant investors, that are given the right to remain in the US on condition to invest at least 500,000 USD in American firms.

In fact, the import of specialists and highly qualified personnel means saving and profiting money for the imported countries. For instance, the US, between 1965 and 1990, saved at least 15 billion USD in the field of science and education. While Canada’s profit from attracting foreign specialists is 7 times higher than the aid costs provided to the developing countries, it is three times higher in Great Britain [40, p. 22, 111, p. 28].

After the Second World War, in the US, according to specialists' calculations, more than 50% of the total increase in output per capita was received from new technologies, mainly technologies that were made by immigrant high qualified specialists who were involved in about 90% of all new scientific ideas in the second half of the 20th century [134, p. 162].

It's important to note that although the global system has experienced a greater shortage of workers related to the aging of the population, and birth rates that are getting smaller and smaller alongside other shortages, it does not want to slow down the economic growth and the standard of living, therefore, it is ready to do everything, including the importation of a highly skilled workforce, which was confirmed in a UN study in the context of population, immigration, and addressing the problems of population aging. [60, p. 1173].

In fact, there is a contradiction between principles in a democracy that does not allow dealing with immigration pressure and the fear of the consequences of the immigration wave. The government in the Western countries and the opposition to foreigners, in the author's opinion, will filter this wave of immigration, which will allow immigration only to the most qualified specialists,

and this is confirmed in the systems intended for obtaining permanent residence in several developed countries such as Australia, Canada, etc. Therefore, the core countries in the global system, concentrate the scientific potential by placing the treasury of intellectual resources at a global level at its service [49, p. 11].

The center of the capitalist global system is responsible for the basic principles in everything related to the activities of scientists in order to ensure and achieve optimal efficiency and profitability as much as possible. The emerging monopolization in this context generates stagnation and contradictions that lead to statements and predictions of a possible crisis of the existing system due to the selfishness that needs to change, if not collapse [112, p. 28].

According to an Israeli survey conducted in the 1990s among Israeli scientists, 83% of the respondents believe that the commercialization of science prevents the research of basic problems, and develops excitement and an entrepreneurial spirit, which are contrary to science, but still, the position of the scientific community is formed with full confidence [144, p. 8, 163, p. 81].

Actually, academic mobility is a concept that is discussed in the academic world and has much momentum. This led to the need to build a broad action plan after the Bologna Declaration while addressing economic, political, educational, and social changes [112, p. 27, 170, p. 5].

Daugeliene, R. was one of several researchers who analyzed the term academic outflow, and in this regard, global economic integration-economic globalization, international trade, and information is more important than ever and demand cultural and linguistic knowledge from several partners [19, 30, 53]. As part of an individual's education, while studying abroad, students internalize and get used to the social and cultural customs of the foreign country and thus to be an ambassador for both countries (the homeland and the host country) [52, p. 58].

Most definitions of brain drain are not inclusive and do not include all its kinds. Other definitions are contemporary and are not valid for any time or place, therefore the author found it appropriate to combine, adapt and refine definitions so that they fit any place, time, and context.

Brain drain is the movement of individuals between countries in order to seek better conditions - academically, occupationally, and economically, which is expressed in a higher and better standard of living.

It can be caused by political, occupational, economic, or educational turmoil, or searching for better and favorable professional or educational standards in other countries, which lead to a massive loss to several fields in the origin country, due to the outflow of a key and evaluable personnel, professionals, and experiences, such as scientists, researchers, doctors, healthcare workers, engineers, and other professionals.

This process of outflow can happen in several forms organizationally, industrially, and

geographically, due to different causes and types of brain drain.

Actually, some of the central causes of such outflow are:

1- Economically- searching for better opportunities, jobs, salaries, higher standards of living, and housing, and on the other hand, lower taxes and living costs.

health care

2- Search for political stability

3- Searching for life stability in all contexts including a safe and quality life

4- Situational factors, such as replacing professionals with machines and technologies.

Actually, the outflow of specialists and professionals is a part of the academic mobility. According to the OECD, employment troubleshooting is tied to experts, since continued economic growth, cooperation, and information development have dramatically increased the migration of skilled and educated persons [216, p. 10].

Some OECD countries have relaxed regulations regarding the immigration of specialists in the hope that they will be able to interest and attract shortages of foreign skilled labor. Academic mobility appears as a potential source of qualified workers from the perspective of host countries, if so, studying abroad can be part of a deliberate strategy for migration for both sides, outflow students and the receiving country. In this regard, some of OECD countries allow students admitted and studying within its borders to submit a residency application in their territory as part of a strategy to increase academic mobility in their countries [157, p. 31, 215].

The Organization of American academic mobility - OPEN DOORS considers the phenomenon of students` academic mobility as an economic phenomenon, due to the fact that it should achieve economic returns by opening academic institutions for national and foreign students [62, 104, p. 32]. For instance, the international students` number in 2015 increased by 124% compared to 2000, which has been translated by revenues of more than 42 million dollars over 15 years. So, the American Authorities encourage the internationalization of educational courses and student mobility. For the exporting countries, the aim is to benefit from technology acquired at minimal cost upon students' return [231]- **Annex No' 8.**

Figure 1.2. presents the trend of student mobility worldwide - a forecast of potential growth in international student demand in 2021.


**Fig. 1.2. Forecast potential growth in international student demand**, 2021

Source: [153]

According to figure 1.2. which presents the trend of student mobility worldwide and a forecast of potential growth in international student demand in 2021, the field of higher education worldwide has drastically changed, due to the fact that students prefer more and more to study in foreign countries and outside of their homeland. 5% forecasted potential growth in international student demand in 2021.

Actually, this trend had a considerable impact, not only on source markets but also on main demanded countries. Just the countries on Anglophone enroll 2.5-3 million international students every year from a total of 5 million outflow students. However, the coronavirus crisis has disrupted all related to global human movements and international education elements and factors.

Most of the international higher education demand is mainly from students from Asian countries. In first place is China, which is the largest source market, then India, which is the fastest growing source market, so it has almost half a million students, with expectations that the percentage will grow to 8.5% between 2019-2030. After China and India are other developing Asian countries such as Bangladesh, Vietnam, and Indonesia with international students from these countries accounting for approximately 0.065 million and expected to reach more than two million students by 2030- **Annex No' 8.**

Actually, there are several elements that cause this significant increase, such as demographic trends, poor local education rather than quality, the accessibility of international education, low salaries, and other factors. In accordance, the trends of worldwide student mobility will remain broader and consistent. The main destination of Anglophones will continue to be Asia as a central source of international students, and the demand will continue increasing.

Even though, there is a reasonable chance that developing countries may lose their professionals, but still there are benefits due to the fact that their workers may gain a lot of knowledge and

experience from working in foreign countries and use it when they go back to their origin country [120, p. 17]. This can contribute to the balance of payments and improve GDP, and have positive impact [124, p. 11].

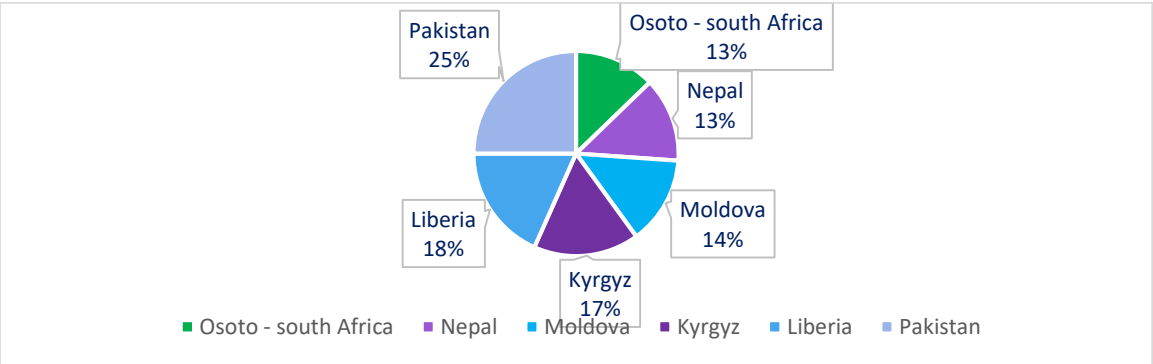



**Fig. 1.3. The population migration and the benefits for the GDP - 2019 (%)**

Source: Made by the Author [229]

Figure 1.3. presents the populations` migrant and the benefits for the GDP in 2019 (by percent) in different countries. It's obvious that in 2019 Pakistan has the largest percentage of populations` migrant and the benefits for the GDP. It is clear without any doubt, there is a direct relationship between the level of academic education and the rate of immigration, so the higher the level of academic education, the higher and more stable the rate of immigration, and vice versa [180, p. 26]- **Annex No' 15.**

**Model of World Migration of the Highly Qualified Specialists**

The international movement of intellectuals can be presented in form of a model that relates and leans the national and international trends in this process [157, p. 146].

The reasons for these movements vary, they began as a result of violence or the pressure of extraordinary circumstances. Later it was as implementation of a state policy that aims to relocate intellectuals to certain countries to gain specific aims. World globalization is meant to ensure the practical implementation of strategic advantages [102, p. 94].

The developed countries have used the scientific and technical achievements of countries at a lesser level of development to promote and grow their science-based production. So, the migration of specialists became a means for achieving scientific and technological achievements in the developed countries - the world-system “core”, especially the USA. Such movements indicate an imbalance in development among the importing and exporting countries of experts socially and economically. In Israel as in semi- and periphery countries, the social and economic problems, add imbalances that lead to massive flows of migration of highly qualified specialists. Even, flows of intellectual migration were formed between developed countries but in smaller

sizes. These movements, for various reasons, were mainly to the USA [119].

Although, intellectual migration is generated by social and economic imbalances in donor countries, still, the migration of specialists caused by imbalances reinforces the imbalances that caused it [102, p. 942]. This was the case in Israel after the movement of a large part of Israeli intellectuals, which caused significant destruction to the scientific knowledge branches, a lack of professional state leadership, and affected the education sector, and social and economic development. Also, Germany suffers from a serious “brain drain” due to social and scientific imbalance, which affects the scientific and educational complex and the innovation sector of the country [70, p. 17].

But, despite the imbalance caused by migration, there are also positive aspects for the exporting countries of specialists, because the experts from the developing countries who move to work in the developed countries succeed in finding foreign partners, forging ties, and manage business relations, and even in a powerful sciences and technology centers such as Silicon Valley, the smallest producers could cooperate with their homeland and gain new production capabilities, skills, and markets [129, p. 291].

Actually, the uneven development of countries belonging to the world system and the imbalance in the development of the periphery countries lead to the “brain drain”. An imbalance is due to the existence of capabilities of the periphery countries to train specialists and professionals, while they are not needed by their country's economy, against the powerful influence of the "core" countries in the center of the world system [126].

The intellectual capital is directed to the place where it can be allocated profitably with less risk, and on the other hand, these professionals flow to the countries where the conditions of payment are better than in their homeland. Capital resources are most likely directed to places where there is less cost and more returns. They are economically better organized in the center of the world system, enjoy a high standard of living as well as the effectiveness of the university research complex of developed countries, primarily in the USA [6, p. 44, 15, p. 12].

Actually, the country can attract foreign investments and foreign "brains" by creating “human capital flow conditions”, but Israel today, suffers from various problems, especially in education and science fields, which means that the intellectual flow can only aggravate [106, p. 59].

To bring back the "national brains", positive changes, developments, and competitive advantage in specific fields should occur in the local scientific and technological fields, which will increase the need for specialists, and lead to the return of scientists and specialists from developed countries. This is what actually happened in India, Russia, China, Taiwan, and other countries after

achieving a competitive advantage in specific fields such as programming in India, and space exploration in Russia, “brains” will begin to flow back [35, 165, p. 20].

In fact, it is important to invest in intellectual property in order to maintain balance in society, so that intellectual property in the "core" countries provides up to half of the state budget. If we compare Israel to developed countries and especially to the United States, which has the best "minds", up to 80% of patents are for inventions, while in Israel it is no more than 0.3%. The value of Israel’s intellectual property, in general, is 400 billion USD. According to some assumptions, it could annually bring 60-70 billion dollars to our country [107, p. 50].

Actually, the intellectual potential created for many generations is concentrated in higher education and academic institutions, which allows preparing a significant number of highly qualified specialists who generate intellectual resources, and Israel, like other periphery countries, is unable to get out of the most of them properly, without providing the necessary conditions for a better life and work conditions [163, p. 68]. Actually, while the center core countries of the world system (developed countries) mainly import specialists and scientists, semi and periphery of the world system (NIC and developing countries) mainly export specialists and scientists- see **Annex No' 1** which presents the social and economic factors of the world system. Actually, the author thinks that the situation can only be changed by re-establishing the connection between intellectual resources and the industrialization of the country, so the conversion of an intellectual product into ownership, and its commercialization should not be taken over by the R & D structures and businesses of developed countries [109, p. 4]**.**

The gains and losses of the countries of the world system due to exporting and importing of specialists and scientists- so-called: "brain drain", and its impacts on the subsequent economic growth:

There is no comprehensive picture of the process and its consequences, so, we suggest comparing a number of economic and social indicators of gains and losses. Actually, accumulating specialists leads to an increase in market wage rates, which contributes to population growth and so the marginal product of capital and labor decreases over time. The constant growth of the population keeps wages at the minimum level and so, the share of labor in the marginal product should increase, the real profit per unit of capital should fall, and then, the incentives for further accumulation should fall [67, p. 19].

The achievements of technological and scientific progress and the development of high technologies should solve the problem of maintaining the growth of capital and labor at the level necessary for sustainable economic growth. The first model of economic growth tries to show the relations arising after the expansion of the main elements of labor, output, and the amount of

available capital. But later, these conclusions were refuted, and scientists could confirm that if the economy is in a steady state, the forces that lead to its long-term balance start working [24, p. 285].

The facts suggest that the output and capital should grow faster than the labor force, the economies of the core-world-system countries are becoming more capital-intensive, the capital-labor ratio of workers is rising, and labor productivity is growing. The old model does not take into account the scientific and technical progress and achievements when intellectual property becomes increasingly important. Actually, if we take into account the indicator of technological progress, then the picture will be different because both capital and output will grow faster than the labor force [103, p. 505].

For conclusion:

1-the achievements of scientific and technological progress affect directly the economic growth and income growth per capita.

2- While the pace of scientific and technological progress can vary under the influence of economic factors, if a method of permanent acceleration of the STP is not found, all one-off measures will only lead to a temporary acceleration of economic growth. As soon as the economy uses these measures, the future growth rate will again be limited by the growth rate of the labor force, the high-tech technologies used, and scientific and technical advancement.

What really is important is striving for stable economic growth and ensuring the improvement of the well-being of the population and intellectual property. The effective use of mechanisms for the involvement of intellectual property and intellectual resources in economic **circulation** is the main factor for the sustainable economic growth of all countries including Israel [137, p. 183].

### 1.3. The Structure of the Global Labor Market, and the Place and Role of Israel in the International Intellectual Production

The global transformation of the world economic space fuels the scientific interest in the problems of the labor market, in the interpretation of its economic content. There have been ongoing discussions around these issues from the second half of the last century to the present day. The difference in the cognitive approaches is quite big and includes a wide range of interpretations - from the one that the labor market represents only the “labor” commodity market before considering this market as part of the labor market. A number of scientific reviews are devoted to the discussion issues of the theory of the labor market [59, p. 478].

The interpretation of the labor market, which considers labor as a complex of both employed and unemployed people in the economy, is called “expansive” in the scientific literature. Many

eminent economists, follow this interpretation due to the fact that there is an external labor market, as well as a labor market, internal to the company. Some researchers, that disagree with this approach, believe that only the unemployed are looking for a paid job, and a small number of people provide them with professional help. At the same time, all those employed in the world economic system in the international labor force including TNC employees, whose divisions are found in various countries on all continents. At the same time, the movement of workers inside TNCs can be viewed both as a movement on the domestic market of one corporation, and as a movement of personnel on the external market - between companies and countries [13, p. 1571].

One of the most accurate interpretations of the labor market argues that, since the commodity is labor then the market in which the commodity is sold is a market of the labor force, not a labor market. The author emphasizes that the concept of "labor market" is synonymous with the concept of "market of labor force" that was steadily included in the economic and social-political literature. The labor market reflects the proportions between the demand and supply of labor force, while employment of the population is characterized by the realized demand for labor force, but unemployment is characterized by its surplus [107, p. 47].

In modern conditions, national labor markets lose their isolation and restraint. There are transnational labor flows between them, which acquire a constant and systematic character. Thus, an international labor market is formed, covering these multidirectional flows and uniting national and regional markets. At the same time, this market is not just the total of national markets, but it represents a new qualitative development of the labor market in the context of the increasing processes of internationalization of production and intensification of contacts between nations.

Different experts identify two ways to form the international labor market: first, through the migration (physical displacement) of labor and capital, and, second, through the gradual merging of national labor markets (the formation of a “common labor market”), when legal, cultural and other partitions between them are eliminated [15, 22, 57]. Sometimes the functioning of the international labor market through the combination of labor and capital can occur without their physical movement, using telecommunicating systems [24, p. 283]. The modern international market of labor force is segmented. Within this market, there are several relatively autonomous markets with their own patterns of labor migration. This is explained by the established international division of labor, the peculiarities of the qualification of the labor force, and the demand for it [42].

As it has already been noted, the international labor market (the market of the labor force) covers multidirectional labor flows across national borders and unites national and regional labor markets, being a supranational entity based on the demand and supply of foreign

labor through its export-import. Obviously, the demand and supply of foreign labor force in various countries (regions of the world) are inextricably linked with the state of national labor markets. In this regard, the developed countries with a high standard of living and therefore the most attractive for foreigners are of particular interest to us [42, p. 861, 191]- **Annex No' 2.**

It`s clear that the proportion of international migrants varies significantly around the world. On average, emigration rates towards OECD countries have increased from 5.5% in 2000/01 to 6.5% in 2015/16. some countries have experienced a larger rise. In a number of East European countries, in particular, Moldova, Romania, and Albania, their emigration rates increased by over five percentage points in the last 15 years. In 2020 there were 281 million migrants, which is about 3.60% of all population- **Annexes No' 7.** But still, several countries lie below the 45 degrees line, meaning that their emigration rates to the OECD area have actually shrunk over time [180, 209]- See the maps attached in **Annexes No' 10, 12, 13, 14.**

Actually, during the 20th century, the market of labor force in the countries of Western Europe, the USA and Japan was shaped by a number of factors that had a super-country, global character. However, the peculiarities of the economic development of individual countries also played a significant role. In 1990s, a number of these counties, were able to drastically improve the employment situation, such as Ireland, as a result of an intensive structural reform of the economy, Ireland underwent a makeover- from a country with a critical position in the labor market, became the European leader in the rate of job creation [181].

Also in Spain, which is the leader among OECD countries in terms of growth in additional jobs, the employment rates have grown since 1999 (2.49% on average from 2000–2003), and Italy was in second place (1.54% on average from 2000-2003). The countries whose average employment rates in 2000-2003 were below the average European indicator (- 0.148%) for the same period, included Norway (- 0.67%), Mexico (- 0.66%), Germany (- 0.24%), and Japan (-0, 18 %) [139].

According to a number of experts, unemployment remains an acute problem for the countries of the European Union, and for two decades, the unemployment rate has not dropped below 10%, and only recently, there have been positive shifts. At the same time, the problem of unemployment is relevant for all countries, regardless of the level of economic development. The most difficult situation is observed in Africa and the Middle East. Women and young people are in the most difficult position in the European and other labor markets. Unemployment among young women in many countries is extremely high [58, p. 572].

The structure of employment in countries with developed economies was determined by the

beginning of the third millennium by a number of factors. Firstly, it continued the process of redistribution of jobs between private and public sectors of the economy, which was the characteristic of the 1990s. Secondly, the majority of new jobs were created in the service sector, which predetermined an increase in the share of this sphere in total employment. In the sectors of material production, only private housing and construction companies managed to attract additional workers. Thirdly, Thirdly, the continuing steady demand for non-traditional types of employment, despite the lower social security associated with them [139, 218].

Actually, the increase in the segment of non-traditional employment was one of the priority objectives of state policy and was considered the main tool for solving the problem of unemployment by developed countries [180].

It should be noted that about 2/3 of jobs in terms of non-traditional employment are created in the service sector. In recent years, the structure of the sphere has changed in favor of industries in which the most skilled labor is involved. Until the 1970s, employment grew mainly due to the redistribution of people employed in agriculture. Since the 1970s, employment in this sphere has been growing with a decrease in the share of the processing industry in the general structure of employment. Depending on the size of the share of the service sector, there are various country types of employment structures [38].

Actually, new professions have appeared in the sphere of services that require advanced training, especially in medicine, education, finance, and in companies specializing in providing business services. In general, over the past 20 years in developed countries, most of the new jobs have been created at enterprises that have mastered the latest models of the newest technologies. The jobs created in the sector of services in countries that are not part of the “core” of the world system are poorly paid for, very labor-intensive, and the conditions do not meet the labor protection standards [ 13, p. 1568].

It's obvious that the professional qualification structure of employment in developed countries will not change dramatically in the nearest future. At the same time, specialists will continue to occupy first place in terms of the number (33.7 million people, or 20.1% of the total number of employees) [5]. In addition, we support the view that in the coming years, the state of the global labor market will be determined by a slowdown in the growth rate of the employable population and an increase in the proportion of older age groups in the overall employment structure. In the first decade of the 21st century, the growth rate of the employable population in OECD countries will decrease by 0.2 points compared with the previous period, which will be especially noticeable in Europe. Starting from 2010, the growth of the employable population in OECD countries will stop, and in Western Europe, it will decrease by an average of 0.2% per year,

i.e., the trend that has emerged in developed countries over the past few years will continue. In this regard, the social sphere will face problems and difficulties, especially, the pension system, health care systems, and social welfare systems [12]. As a result, according to Justin Heath from the Hudson Institute, the need for foreign labor will increase because of the reduction in the employable population in many developed countries. Actually, this shortage is almost filled by the foreign labor force and intellectual elite mainly from countries such as Eastern and Central, Europe, China, and the former USSR [22]**.**

By analyzing the sphere of employment of the world labor market, experts identify four areas where major changes have occurred recently, namely: the amount of work available, working conditions provided, the income that it brings, and job security [57]. The author believes that the stability of employment is declining, and the problems of unemployment today affect those workers who traditionally had stable employment, high wages, and the possibility of training and promotion. This is because of the reduction of the production cycle (including the use of modern technologies), the need to sell unclaimed production facilities in order to reduce costs, and the increased flexibility of production as a whole. The author considers that the most important direction in reducing insecurity and instability in the field of employment today is the systematic improvement of professional skills. Moreover, highly qualified specialists remain in great demand in the labor market.

There is no doubt that the availability of skilled labor generally is one of the factors of competitiveness of national economies. Consequently, in order to determine the country's position in the global economy in general and on the global labor market in particular, it is necessary to take into account the existence and the need for personnel of a particular qualification. The growing need for highly skilled workers is largely influenced by rapid changes in technology and

Actually, the demand for highly qualified personnel in developed countries is determined by their economic needs, in particular, the rapid development of information technologies. only in the 1990s, about 900 thousand highly qualified specialists, first of all, in the field of information technology (IT) immigrated to the USA: the main donor countries were India, China, Russia, Canada, the United Kingdom, and Germany. In 2000 only 500 thousand people left to the United States from Eastern Europe alone [29, 165, p. 24].

It should be noted that today, thanks to the Internet, along with the traditional forms of use of foreign workers in the territory of the host country, new information forms have emerged that allow highly qualified specialists from other countries to work for foreign clients while they are in their homeland. This phenomenon is called outsourcing. Information technologies using the Internet have also taken a solid place in the field of education. In developed countries, about 5%

of all students' study is through distance learning programs [38].

The scientific and technological revolution caused qualitative changes in international labor migration, the main of which was a significant increase in the share of qualified specialists among migrants. The new features in this process are [57, 64, 111]:

1. “Brain drain” is periodically replaced by “**brain circulation**” [21].
2. There has been a diversification of migration directions. while professionals from industrialized countries can take temporary jobs in developing countries, the US remains to be the accepted center of attraction for professionals [180, p. 25, 180, p. 27]- **Annexes No' 7, 11**.
3. The movement of professionals has become a new phenomenon. This is due to the activities of TNCs and great opportunities for career advancement.
4. The level of immigration of specialists is characterized as a kind of an international corporation of "brain hunters".
5. Integration of the higher education system, which offers and enables students from around the world to study and continue their studies, reduces their chances to return to their homeland due to the opening of horizons and possibilities of advancements in the host countries.

   More than two-thirds of the outgoing student's study and live in twenty main countries of which the three main ones are: in first place the US with 19%, then the UK with 9%, and Australia with 6%. On the other hand, China is no doubt the main source of globally mobile students. In 2015, over 800,000 students were studying abroad. After China, India, and to a lesser extent Germany in the same context. According to a recent OECD study, it is likely that India will overtake China in the supply of mobile students, due to demographic trends [231] **-Annex No' 9.**

Actually, the USA is considered the main center of gravity for foreign scientists and professionals. The USA accounts for almost 32% of all foreign students who study in OECD countries. Since 1998, American companies are lobbying for an increase in the number of visas for experts working in information technologies. Also, some of the developed countries have made efforts to attract foreign scientists and experts and have been active in this regard, such as China, Japan, Canada, Germany, Malaysia, and Singapore [109, 160].

Although in the EU, the shortage of IT specialists is estimated at 1.7 million people, the European countries continue to remain a source of scientific personnel for the USA, and in the period after the Second World War, more than 100,000 scientists moved from Europe to the USA [160, p. 327] **- Annex No' 5.**

Some researchers distinguish between "brain drain", and "university migrants", which includes university scientists, professors, and students. According to the National Science

Foundation of the USA, the USA Department of Labor statistics and the Institute of International Education, about 50% of all Europeans who complete their Ph.D. thesis in the USA remain there for a longer period, many of them forever. Nevertheless, students of actively developing countries and countries with transitional economies tend to remain in the USA more often. In particular, in the 1990s after receiving diplomas in the USA, 79% of Indian and 88% of Chinese students remained in the country [206].

Comparing the results of attracting scientists and students by the US and several European countries, although the cost of education in the US is significantly higher than in European countries, there is a clear leadership of the US, and even that many European universities provide free education to foreigners [41, p. 81]. The reason is that in the USA, working conditions and laboratory equipment are much better, and salaries are higher. The USA is very attractive for the students with well-equipped campuses, the opportunity to learn English, a closer link between university programs and industry, and the active involvement of students in R & D. Most importantly, many students, as already noted, want to stay in the USA and get permission to work there. USA law makes it very accessible to students and their employers [68, p. 11].

In addition, the rapid influx of foreign students in the United States is due to a number of additional reasons related to the fact that it is easier for a student to adapt to the new environment, learn the language and the customs of the country, etc., compared to a poorly educated migrant. Moreover, both students and "ready-made" specialists of foreign origin are more likely to agree on less profitable work in a developed country than their colleagues of native origin, thereby meeting the specific needs of the host country [138, p. 18].

Nevertheless, the USA, remaining a very attractive country for foreign labor, as well as making a lot of effort to create its own specialists, in the near future may experience a complication in the situation. Actually, in terms of the annual growth rate of the number of students, the USA lags behind many countries in the world, both developed and developing. For example, from 1990-1996 the rate of growth in the number of students in Europe was 2.1%, in Asia — 5.9%, and in Africa — 7.2%. In the US, this figure was only 1.3%. In the total world increase in the number of students during this period, the share of Asian countries was 62.6%, Europe - 16.1%, the USA - 11.9%, and Africa - 9.4%. For example, 122, 000 potential engineers graduate from Indian universities annually, while only 63,000 engineering students graduate from American universities [135, p. 68].

In addition, even with the predicted shortage of skilled labor, the demand for it can sometimes decrease because of a recession. This happened in 2001 when the number of immigrants who arrived in the USA under the H-1B program (the simplified temporary work permit program

for qualified specialists) decreased by half, and a significant number of those who had previously arrived lost their careers [40, p. 24].

However, the author shares the opinion of many researchers regards the immediate economic benefits of migration for the host countries (primarily developed ones), which are incommensurably more significant than the problems. In particular, the contribution of intellectual immigration to the development of the American economy is widely known. Only the companies in Silicon Valley employ much more than two million foreigners. The active development of modern high-tech field industries is largely due to the participation of the foreign labor forces. In addition, 40% of those who entered the US labor market in the 1980s and 1990s, Doctors of the disciplines of science mainly in engineering and computer fields were immigrants; 25% of teachers of technical subjects in universities were also immigrants. It is estimated that in the mid-1990s the immigrants who lived in the US earned no less than 240 billion USD in a year, paying about 90 billion dollars in taxes. At the same time, the US government spends only about $ 5 billion annually on the social welfare of immigrants. Obviously, the return that this category of citizens provides in purely monetary terms is very high, not to mention the contribution that they make to the development of science and technology [137, p. 176].

An American study based on statistics from the USA and Canada, confirms the fact that immigrants, in general, pay more taxes and fees and receive fewer social benefits than the local population. At the same time, there is no steady increase in the wages of workers and employees in developed countries. The exception may be only some sectors of the economy, requiring the use of the latest technologies and a highly skilled labor force. A similar situation can be observed in countries with transition economies. The main trend of the last decade was to suspend the growth of labor costs in foreign countries with a continuing increase in labor productivity. The conclusion is almost unequivocal - the wages of immigrants and residents of host countries have not significantly increased recently. Nevertheless, even in such a situation, immigrants still receive less than the local population [60, p. 1168].

A vivid of the predominantly **positive influence** of immigration on the country's economy is Israel which pursues a targeted policy of attracting Jews from all over the world to the country. Largely due to the immigration of scientific and highly skilled personnel, Israel has become one of the most economically, scientifically, and technically advanced countries. Russian emigration played an exceptional role in this [4, p. 35, 102, p. 943].

Considering the consequences of emigration in general and intellectual in particular, one usually notes a positive point related to financial transfers of migrant workers to their families, as well as certain payments to the budgets of their countries. According to the available data, in a

number of cases, such transfers reach quite noticeable values. For example, the transfer of emigrants' income to Egypt of $ 2.8 billion stimulated the creation of additional GDP of $ 6.8 billion, which amounted to 16% of the country's GDP. At the same time, the author agrees with the opinion that the negative effect of the emigration of highly qualified personnel can hardly be compensated by the funds that the specialists send to the country [31, p. 23].

Actually, Europeans perceive the “brain drain” from Europe, primarily as the threat of losing the scientific elite [241, p. 50]. The overwhelming majority of specialists support the idea that the irrevocable departure of qualified professionals is detrimental to the economic, scientific, and technical potential of the donor country [24, p. 285].

The scientific literature on the impact of “brain drain” on the economies of developing countries exporting labor can be divided into two large blocks. The earlier sources deal mainly with the negative impact, and the later ones show the significant positive effects of this process. The positive effects are the remittances of migrants to their homeland; return migration; the creation by migrants of business and trade networks facilitating the economic interaction between the exporting and importing countries; a possible stimulating influence that migration has on the development of the education system and the formation of human capital in the country exporting labor force [107, p. 46]. However, according to the author, most of the existing studies indicate that the positive effects of emigration still cannot fully compensate for the losses of developing countries associated with the “brain drain”. To a certain extent, the attribution of certain consequences of international labor migration to negative or positive cannot be simple, depending on the social and economic situation in a particular country [139, 185].

In general, highlighting the most common positive and negative consequences for labor-exporting countries and labor–importing countries, the following aspects are usually noted: for an exporting country, positive consequences for an employee are acquiring a new qualification, reducing the payment balance deficit, easing stress in the domestic labor market, facilitating the structural and technological restructuring of production. The negative consequences for the importing country may include the inhibition of the introduction of labor-saving technologies; the complication of the situation in the domestic labor market; increased spending on the maintenance of unemployed foreigners and their families [48, p. 226].

As in the past 20 years, not only in developed countries, but also in a number of developing countries, a tendency to an increase in the share of the skilled labor force in total employment is clearly seen, and the potential of “intellectual migration” increases. China and India are becoming the largest exporters of skilled personnel [38].

At the same time, the increase in the share of skilled labor in the overall structure of

employment in developing countries is going faster than in industrialized ones. The share of developing countries in the global number of qualified personnel over the past 20 years has increased from 32% to 49%, while the share of the workforce of this group of countries in the world has grown from 79% to 83% [38].

In modern conditions, the rate of human capital allows countries to achieve high rates of economic development. An excellent illustration is the example of Singapore, which is called the most globalized country in the world based on many indicators. Singapore is ranked in the top five of the most competitive countries in the world (World Economic Forum rating), while Japan has dropped to the 21st position [16, p. 3206].

At one time, Singaporean leaders felt it was useless to compete with China in the cheapness of labor and products, and therefore made emphasis on educating, preparing, and using a high-quality, intelligent, and, therefore, expensive working force capable of creating complex goods with high added value. Singapore attracts talented specialists from all over the world and, above all, from the countries that are its main partners [34].

Singapore has a rather ambitious task - to become a developed information-intellectual and multimedia center in Asia, Europe, and America. The country is encouraged to open research units of TNCs, and they reduced taxation for foreign workers. Today, about 700 thousand foreigners account for 3 million Singaporeans. Its main task is to prepare a competitive labor force of the 21st century [56, p. 32].

The achievements of India are no less impressive, the country, along with China, can be called the "economic miracle." China is the “workshop” of the world, which provides employment for the unskilled labor force, and India is the “global office” that relies on the skilled labor force. Today there are 150 thousand qualified programmers in Bangalore, which is, 30 thousand more than in Silicon Valley. India has become the first exporter of information services, whose share in GDP is already 7% and 50% of the country's exports. Like China, many companies are attracted to India by low-cost labor, but unlike China, India has relied on skilled labor [101, p. 113].

Today, India is intensively developing the outsourcing industry. “Corporations come to India to save money, but remain because of the quality,” says Pramod Bhasin, director of GE Capital International Services that solves the back-office tasks for TNC. In his opinion, companies that have moved all their activities abroad can save up to 70% of their expenses.

According to calculations by analysts from Goldman Sachs, the GDP of India in 2020 will twice as big as the GDP of France, and by the year 2035, it will be more than that of Japan. That is, India will take third place in the global economy and will be inferior in scale only to China and the United States. The experts believe that one of the decisive factors determining the success of

sustainable growth in India is not so much the cost of the labor force as in China, but its quality. Along with the fact that the second language in the country is English, the Indian state traditionally pays special attention to the education system [111].

In modern conditions for the success of the enterprise and the employee's job preservation, raising the level of education and improving the training of the workforce are needed everywhere, but the requirements for the worker's qualifications and the quality of work are increasing today in developed countries where workers must constantly learn and relearn [139]. In the EU, in the framework of the implementation of the European employment policy in accordance with the principle of optimizing employment, the goal is to form new professional skills and improve them throughout a person's life. In particular, the former Prime Minister of Singapore, Lee Kuan Yew, 1981 declared that the main task of allocating money for the country was the investment in human capital. In accordance with this objective, a system of life-long learning is being successfully implemented in Singapore [57].

The problem of the effectiveness of existing educational systems is in close connection with the ever-increasing demands for the quality of the labor force [32, p. 30]. In the United States, broad coverage of workers with vocational training programs is largely due to the fact that basic education often does not meet the requirements of the technological revolution, and is at a low level. According to the latest American data, 90% of adult US citizens do not know how to use the knowledge that they got at school [42, p. 856].

Reducing the quality of schooling is today a global problem. In the USA, it is much sharper than in other developed countries. At the same time, the state policy of improving the quality of labor resources (through education) is carried out in close financial and organizational cooperation between entrepreneurs and various social institutions [66, p. 17]. Researchers emphasize the role of social partnerships in the field of professional education. The author believes that the joint participation of social partners can provide sustainable and high-quality education and training. Actually, corporate retraining systems in the United States have certain drawbacks [66, p. 76].

There are certain problems of efficiency not only in the system of secondary education but also in that of the higher education in developed countries. In particular, the American IT Association made a statement that the USA higher education system does not adequately prepare qualified personnel for the needs of the industry. Actually, more than a third of college and university graduates (IT profile) do not work according to their specialty. Less than 50% of IT workers in the USA have a four-year education they get at a college or university [48, p. 226].

the forecast, that in the next decade the trend towards increasing demands on the level of education of the labor force will continue. The employees who have a level of education not lower

than a bachelor's degree will be in great demand [240, p. 60]. According to the authors' forecasts, by 2010 bachelors will occupy 18.1% of all jobs in the US economy. At the same time, the number of jobs for people with a master's degree or a Ph.D. will not exceed 4%. Thus, at least during the next decade, in developed countries, there will remain a demand for a labor force with higher education, including foreign ones [13, p. 1571, 42, p. 850].

In recent years, the pay gap in the OECD countries for unskilled and skilled workers has increased significantly. A similar situation can be observed in countries with transition economies. This point of view in the research is confirmed by BUSETTI, S. et al. According to their work, in many developed countries, the difference between the income of highly paid and low-paid workers is quite significant. Nevertheless, in some developed countries, such a gap in income was not clearly observed, but somewhere it even increased [33].

Based on different approaches of foreign and Israeli authors in regard to the place of the labor force with different levels of qualifications and educational attainment in the modern world labor market, there are obvious trends in this regard:

1. Globally, the position of professional workers is more stable than low professionals. While professional workers are employed in permanent positions, the less skilled are employed on a temporary and seasonal basis [1, p. 1102].

2. Labor market worldwide is strongly affected by the spread of information technology. Such global distance communication systems increase and expand the interaction between employers around the world. This requires the use of appropriate tools and unique requirements, so professionals in such conditions is in a more advantageous position than a low-skilled one [133, p. 67].

3. By justifying several studies, while in developed countries, there is a shortage of professional employees, in multiple developed countries there is an excess of professionals and experts, including local specialists. The demand for foreign professionals can be explained by their lower wages relative to the local specialists [160, p. 327]**- Annex No' 5.**

4. The direction of migration of professionals is mainly from developing countries to developed countries. The focal developed and recipient countries of qualified specialists are the USA and then several developed countries in Europe [13, p. 1562, 102, p. 943].

For the European countries, the migration processes occur within Europe itself, so the main concerns about European countries are brain drain from European countries to the USA [138, p. 14].

5. Brain migration has unequivocal effects and consequences both positive and negative in the exporting country of experts and in the importing one. These consequences depend on the

economic and social situation in these countries, and it is always important to weigh and compare the gains against the losses from labor migration in each country [109, p. 4]- **Annex No' 6.**

6. In developed countries as well as in a number of developing countries, steps and actions are being taken to raise the level of education, training, and vocational training of workers in order to raise the level and quality of the workforce, which is measured by their level and quality of performance. But still, the process of preparing the workforce suffers from a number of drawbacks, which are reflected in the continuing demand for foreign laborers in developed countries [180, p. 11]- **Annex No' 13.**

7. The difference between the wages of highly paid and low-paid workers in many developed countries is significant and it even tends to increase for various reasons [60, p. 1172].

**Place and Role of Israel in the International Intellectual Production**

The high-tech sector is the main country's export leader in Israel. Although the percentage of high-tech employee jobs in Israel in 2015 was about 2.7% of all employee jobs, they made up almost 40.1% of the total export percentage. Israel should remain attractive for experts who are in high demand by other countries. Israel should remain attractive for experts who are highly sought after by countries at an international level and must strictly determine Israel's national priorities since at most 130 thousand people guard the economic field, the health system, and the universities bedrock. In our society, science is globalizing faster than many other spheres, itself being one of the main agents of globalization [70, p. 12].

As it was emphasized in the 2004 management annual report of the OECD, science and technology constitute a basis of economic growth and well-being in the knowledge-based economy [215]. Indeed, the costs of R&D in the leading economically developed countries of the world in the second half of the 20th century grew very fast. Today, the five leading countries in financing research and development are the USA, Japan, Germany, France, and the UK. They spend about 80% of the world's research funds on their own research and concentrate more than 50% of the employed scientific staff. If so, we can notice low emigration rates of migrants with high education degrees [109, p. 4, 165, p. 17, 233]- **Annexes No' 16, 17, 18**.

As expert estimates show, in the coming years, there will be a further increase in this indicator. The most important factors determining the scientific and technical potential of any state are the level of funding for scientific activities and the country's availability of scientific personnel of appropriate qualifications. On the scale of the world economy as a whole, today funds in the amount of close to 700 billion USD are directed to the development of research and development, which ensures the activity of more than 5 million specialists and scientists. The lion's share of this impressive resource belongs to several of the most developed countries in the core of the world

system [38, p. 14, 137].

In Israel, the total number of scientific articles per million inhabitants in 2018 was 110. The total number of scientific articles for the period from 1988 to 2018 grew throughout the world, but the indicators of Israel decreased significantly [144, p. 6]. All this confirms that the uneven development of the modern world system and especially the three leaders of the modern world: the USA, Japan, and Western Europe, besides the growing influence of TNCs, forms serious contradictions and distortions. There are suggestions that all three centers equally or, at least in proportion to their innovation potential, finance the pre-economic part of the scientific and technical process [137].

The place of Israel in the world's scientific production and the problems it faces are different from other developed countries around the world. Israel has not been the undisputed world leader in the field of science and has generally presented quite high indices, and in some areas of research even the highest achievements. The civil science branches were secondarily funded and were a by-product of the arms race. Such a structure of budget expenditures for individual research areas has dominated Israeli science to this day [50, p. 15]. In fact, there is a misconception that Israel was ostensibly the second largest economy in the world, but this opinion is incorrect and Israel has never risen to fifth place in the list of countries in the world. In fact, Israeli science is not sufficiently funded, which is reflected in the lowest share of Israeli high-tech products in global markets [183].

Israel does not take into account the interdependence between budgetary investments in basic research development and macroeconomic indicators such as economic growth, and shares high-tech products in the scope of production, the volume of high-tech products with research funding, and Israel's share of global high-tech products markets. If so, it is important to compare the volume of funding for R&D in Israel compared to the United States over the past 20 years [50, p. 23].

The striking aspect of the specificity of financing science in Israel is the fact that in recent years the established financing standards are violated without any serious consequences for the perpetrators, which are the representatives of the executive branch. However, judging by the most common indicators of research activity, Israel is still in the leading group. Israel’s contribution to its traditionally strong fields of science is still high. Along with this, the contribution of Israeli scientists to life sciences intensively developing in economically leading countries is relatively low [144, p. 8].

According to generalized data, the production of high technology products in the world is provided by only 50 macro-technologies, while Israel occupies a prominent place in the global

high-tech market and is able to compete quite successfully in the global market for high-tech products of about 10-15 out of 50 macro-technologies. Israel continues to hold leadership in nuclear technologies, confidently exporting equipment, building nuclear power plants and research reactors, selling uranium enrichment services, ready-made accelerators, lasers, and other modern equipment [125, p. 12].

With the competition in the global market for high-tech products, Israeli exports account for less than 0.5%. For Israel, it is inadmissible to lose what has already been gained under conditions when the prospects of scientific research are universally made dependent on their competitiveness and commercial efficiency [125, p. 14].

Actually, the second group with an average level of science development (from 0.51 to 0.11) includes the overwhelming majority of countries in the world, including Israel (0.181). In all these countries, the state financing of science prevails, and this is clearly insufficient. The lack of private capital in scientific expenditures is explained by the relatively low proportion of high-tech production in these countries. However, Israel, which is located in the lower part of the range of this indicator, is approaching the third group of countries. The third group - countries with a low level of development of science (indicator - below 0.11) - includes 12 states, including India, China, Vietnam, Uzbekistan, Tajikistan, Uruguay, etc. [177, p. 5].

Despite the decline in the number of Israelis working in scientific research and despite the continuing downward trend, the number of Israeli researchers is up to 12% of the scholars of the world (in the USA - 25%). By the number of Israeli scholars who received the Nobel Prizes, Israel occupies the7th place in the world, which indicates the important efforts of Israeli scientists in the world scientific process.

In fact, Israel is declining in intellectual production, in the volume of scientific products, and also in the funding of the resource base and manpower, although more than 90% of the scientific funding is provided by the state of Israel [177, p. 6].

### 1.4. Conclusions of the 1 Chapter

In light of the professional literature, statistics, and studies presented in the subchapters of the first chapter, we can divide the conclusions into two levels - global and local levels.

**At the Global Level**

1. A study published in 2019 found a high correlation between the level of university funding (normalized to the number of students) and the weighted score in the international rankings. The study found that public funding has a significant effect on the ranking of universities in the rankings. Universities ranked among the top 100 in the QS rankings received double

funding from universities ranked 101-200, and funding three times higher than universities ranked 201-300 [105, p. 52].

2. There are countries that have established excellent programs to promote research through a significant increase in funding for the academic sector. Many of the excellent programs focus on promoting internationalism as a key strategy for recruiting leading researchers and academic talents. Comparing the results of the countries that appear in the rankings, one can see 4 countries whose progress is particularly noticeable: China, Australia, Saudi Arabia, and Taiwan. These countries have at least one excellence program that deals with increasing investment in leading universities [108, p. 27].
3. The Chinese government has set itself a goal: to put 42 of its universities in the top rankings by 2050. This program is called the "Double World-Class Project" and through it - selected universities will receive a significant budget increase. The excellent programs have been found to be a means of funding that effectively contributes to the promotion of the performance of universities and academic institutions worldwide [101, p. 118].
4. The use of university rankings has risen sharply in recent decades and with it the discussion of the accuracy and usefulness of the various rankings. The ranking may contribute to the prioritization of individuals, institutions, and countries as well as to promotional competition. However, it is not an exact science and its results depend on the details of the methodologies.

   University rankings are based on different combinations of different metrics from a wide variety of sources. The rise in the types of methodologies and criticism indicates that there is no broad consensus on the subject, and yet special attention is given to these ratings and they also have known practical and economic implications [8, p. 21].

5. The level of education and its level of intensity in each country are influenced by the worldwide trends based on the economic-social-demographic changes that the world undergoes. Theories and philosophies are changing world orders in all areas, and thus, they affect the various stages of education including academic education.

6. The concept "Increase for Academic Mobility" has increased following the initiation of the Bologna Reform in 1999. The academic institutions had opened their gates to the students of higher education and presented them with degrees and tracks. The demand for academic mobility led to the immigration of communities of students, specialists, and researchers between various countries and universities [32, p. 41].

7. Clarification of the term "academic mobility", and providing a diverse perspective on the meaning of the mobility of the higher education students and academic staff (researchers and lecturers), and its consequences on the national gross product [24, p. 283].

8. Academic mobility is aimed at acquiring higher education for one's personal and professional development, which one was unable to receive in the homeland. Academic mobility is supposed to provide a wide, diverse "academic experience", designed to enrich the world of knowledge and professional experience of the higher education students [37].

9. The phenomenon of academic mobility, with all its consequences, affects the relations of countries on a global level, including cooperation in various contexts - economic, tourism, and others, which affects the levels and directions of academic mobility on a global vision.

**10.** In countries that suffer from negative academic mobility, there is a dependency between socio-economic values and the level of academic mobility.

**At the Local Level**

1. Israeli academic centers aspire, within the economic relations, to advance the research fields which are performed by the academic staff and students for higher education in these institutions, by signing cooperation agreements with the leading worldwide academic institutions [163, p. 67].

2. The phenomenon of immigration from Israel is one of the most important contexts, and the problem is getting worse as Israel integrates more into the developed world since a larger portion of its citizens immigrates, especially academics and graduates of the prestigious academic institutions which are ought to ensure the country's economic growth in main fields and sectors [27]. Due to the aggravation of the problem of brain drain in Israel, the author in the proposed study examines and explores the main reasons and elements of specialists and skilled professionals leaving the country, and the conclusions are a spotlight and an indication of concern due to the seriousness of the situation. So, the hypothesis of the research is that there are main factors, from all motives and reasons (dependent variables) that affect the brain drain phenomenon (independent variable), while the researcher speculates that the reduced investment in academic education is the most explanatory variable.

# 2. AN ANALYSIS OF THE ISRAELI BRAIN DRAIN AND ITS INFLUENCES ON THE ISRAELI ACADEMIC SITUATION AND LABOR MARKET IN COMPARISON TO THE INTERNATIONAL SITUATION

## 2.1. The International Phenomenon of Brain Drain

When right-wing political movements came to power in Europe in the 1930s, many well-known intellectuals decided to leave. Many intellectuals such as Albert Einstein, Enrico Fermi and Niels Bohr, moved to the United States to live and work in security, and at a later stage, the brain drain greatly cheered Germany and especially East Berlin, which forced them to build a wall to stop this wave of immigration [113, p. 31, 154].

### The Venezuelan Brain Drain

Venezuela had a similar situation of mobility, especially in the Bolivarian diaspora. At first, mobility was possible only to educated and wealthy people, and later it was allowed for everyone. The process was initially driven by the administration of Hugo Chávez, known as a revolutionary administration, and known to have heavy socialist tendencies, but later with the collapse of the economy in Venezuela, and especially after his death, due to the extremely difficult living conditions, the number of Venezuelans who left doubled and even jumped greatly [136].

### The Turkish Brain Drain

Recently, Turkey has been suffering from mobility at different levels and contexts of talented, educated and rich people. This is caused due to direct and indirect reasons mainly the very increasing authoritarianism of the current Turkish President Erdogan, where the economy under his presidency is managed in a failed manner, and this is getting even worse, which results in the departure of key people both at the economic and academic levels [131, p. 11].

### The phenomenon of Brain Drain in Germany

Germany remains one of the most requested destinations for professionals in Europe, after Norway and the UK, although almost half of the professionals that Norway attracted, came only from Sweden [69, p. 192].

In fact, data from the EU showed that German professionals were at the top of the list of professionals in European countries who wanted to move to another country in order to get certified and specialized in other European countries, mainly in Switzerland and Austria, and there is evidence that many German professionals are able to find suitable and respectable work outside the borders of their homeland due to their perfected specialization and expertise. Actually, the recognition rates of German professionals such as doctors, nurses, architects, and others, are among the highest in Europe - 89 percent of all professionals. But Germany doesn't enable the same courtesy to foreigners.

Overall, Germany suffered a brain drain, with nearly 6,000 more accredited workers leaving the country than coming in. Doctors were also the most mobile profession and went overwhelmingly to Switzerland (58%). Overall, in Europe, the most mobility was among doctors, followed by nursing, and then high-school teachers [203].

**The Brain Drain in the United States of America**

What characterizes the brain drain in the United States, is that it is between different regions within the borders of the United States, and not to other countries. For almost a hundred years, Americans living in villages and suburbs tend to move to the big and central cities within the United States borders, which significantly hurts and disturbs the Great Plains region. This is caused by many reasons such as poor management by the government in this regard alongside economic failures which manifest in a lack of economic opportunities, alongside a massive factor that manifests in the attraction of other regions which are experiencing much faster growth [113, p. 16, 159, p. 43].

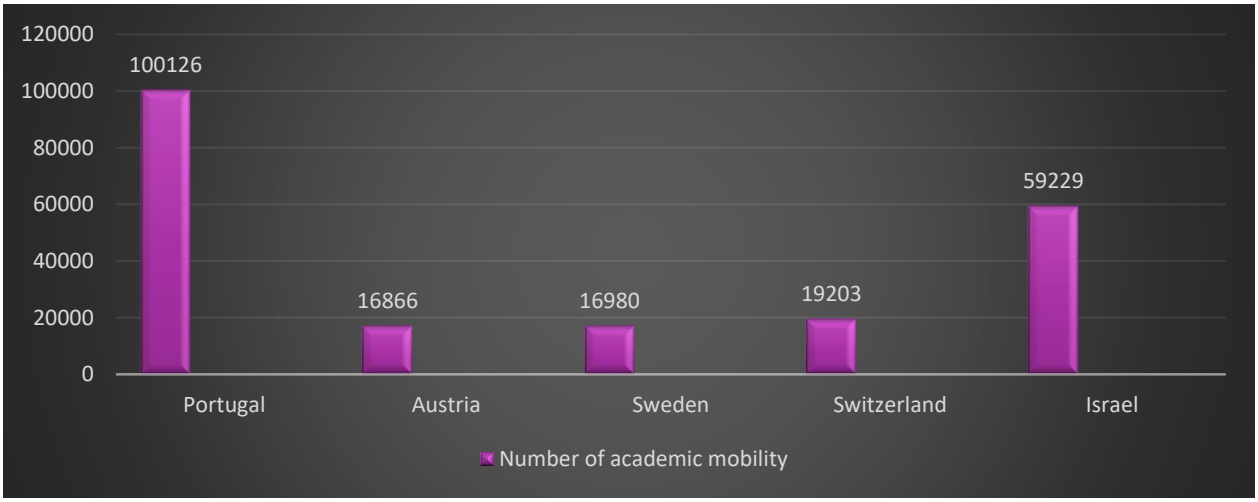



**Fig. 2.1. The academic mobility to the USA from countries with Similar data to Israel – 2019**

Source: Made by the Author from sources [16, 173, 179, 182, 192]

According to figure 2.1. which presents the academic mobility to the USA from countries with Similar data to Israel in 2019, we can notice academic mobility to the USA from various countries including developed countries. It's clear that Portugal has the biggest number of academic mobility- about 100126 in the year 2019, and then Israel with about 59229 academics. No doubt, this constitutes, a relatively very high number and percentage of academic mobility.

On the national scale, talented and educated people on an international level prevail in the United States. A fundamental problem in the United States is the retention and retention of foreign students studying in American universities and academic institutions so that they work and contribute to the country in the relevant contexts and fields. It is true that some experts and

scientists have recently moved from the US to other countries due to the failures of recent US policies, but still, the number and percentage of these immigrants are relatively low. Actually, the risks always remain, and failures of all kinds, especially if the trend worsens and becomes sweeping, may cause the migration of talented and professional people from the central cities, which are the focus of growth and development in all its contexts, to peripheral areas. In this context, it is important to note that the American middle class is poorer relative to several other countries, especially countries like Australia and Canada, and if we compare the level of poverty in the US and European countries, the European poor in Europe is better than in the USA. In terms of health, while health care in the United States is more expensive, it provides less health care. Also politically, the situation is getting worse, and almost a third of the population thinks that a civil war is imminent [141, p. 56].

In fact, the question arises: Is the US at a real risk of brain drain? The answer is generally that there is no real and immediate risk of brain drain, but the risk always exists in context. Cases in this context that have occurred in several countries such as Germany, Turkey, and Venezuela, indicate that it is It can always happen even if it takes some time to kick in. As the world becomes more connected, the process of immigration between countries becomes more practical, practical, easier and possible [140, p. 411].

**The Brain Drain in the United Kingdom**

According to a new study- the study by Oxford Research, the WZB Social Sciences Center Berlin, and based on OECD and Eurostat data, the UK is facing a brain drain, and many highly-educated British citizens are likely to migrate.

In fact, this navigates and reveals that there are different intentions and decisions in the context of expert and qualified immigration, which predicts that the country is facing a wave of brain drain, which will cause a serious economic, political, occupational, and academic crisis, since Brexit was the most dominant in terms of immigration decisions since 2016, compared to current More stable migration of the European Union at that time [72, p. 126, 198].

According to the study, the number of British immigrants is increasing, and the immigration decisions they make aim to protect themselves from the negative effects of Brexit, and what is evidenced by this is a large number of British citizens obtaining passports of European countries that are members of the European Union. In fact, the data show that immigration from Great Britain to EU countries has increased by almost 30% due to Brexit, compared to the numbers before, and the number of British citizens who received a passport from another country that is a member of the European Union has increased more than five times - about 500%, and especially in Germany it has increased more than 20 times - almost 2000% [112, p. 28, 112, p. 778, 235].

**The Russian Brain Drain- Migration of researchers to and from Russia-**

The migration of Russian experts and researchers was mainly detected due to changes in their affiliation addresses, which change the country of affiliation over time. From 1996 to 2020 from an exhaustive group that contained more than 2.4 million Scopus publications, we can testify and notice that the affiliation addresses of only almost 5.2% of Russian researchers have changed and they are considered international mobile researchers, but still, they constitute a significant part of the citations, and on the other hand more than 659,000 Russian researchers who have published with a Russian affiliation address in their career have almost never changed their affiliation address at all, indicating that they are still Russian residents [221].

The estimates regarding the percentages of emigration and net emigration give a predictive indication that even though Russia was a contributing country in the second part of the 90s and the first part of the 2000s, it experienced and still experiences a relatively **balanced circulation and distribution** of researchers even in recent times. Bento, the number of researchers emigrating from Russia and leaving it exceeds the number of researchers immigrating to it, but they exceed their performance [152], **Annexes No' 19**.

Undoubtedly, this indicates that Russia suffered a loss in almost most disciplines and especially in five main scientific disciplines: decision science, mathematics, biochemistry, neuroscience, and pharmacology. These new aspects of this international academic mobility directly affect the development and management of the policies and systems in the national scientific cave [221]. See **Annexes No' 20**, **21.**

**The Ukrainian Brain Drain**

Ukraine's main crisis is the war in the east of the country. But, in addition, the state of Ukraine is struggling with another major disaster alongside the war in the East, and that is the migration of the Ukrainian workforce outside its borders, which is manifested in the loss of its skilled human capital, and this has a negative impact on the Ukrainian economy, on economic development and growth, and on the future economic stability of the country.

In fact, one of the main reasons for the brain drain from Ukraine is the lack of suitable job opportunities, the war in the Donbas region that is still raging, and especially the failures of responsible bodies to curb the corruption that prevails in the country in many contexts, which is actually what some studies point to as a serious obstacle that modern Ukraine is trying to deal with [162].

The country's political elite has long ignored the phenomenon of human capital flight despite its effects in many contexts. The victory of Zelensky in the presidency, who is the most

popular presidential candidate among young voters (according to a survey published by the Kyiv International Institute of Sociology - KIIS), may contribute significantly to the preservation of Ukraine's young talent, and even encourage the "brains" that have already left to return to Ukraine [162].

Ukrainians living abroad feel a strong passion for their country of origin. In fact, according to a late survey, almost 60% of Ukrainian migrant workers wish to return to their homeland, but this will not be possible unless significant improvements are made and suitable job opportunities are made available for skilled workers who have already emigrated. In this context and to deal with the corruption and ineffectiveness, especially among the young Ukrainians, there were several reforms, which, besides their main goal, are also aimed at attracting both local and foreign investors to invest in Ukraine, which will make Ukraine more attractive.

In fact, there is a need for an understandable and applicable reform that will deal with and eradicate corruption in Ukraine and turn Ukraine into a prosperous and developing country, which will reduce the dimensions of Ukraine's brain drain phenomenon. If we succeed in implementing such reform alongside the Ukrainian government support, it is likely that the "brains" of the country will stay and contribute to the long-term Ukrainian development and prosperity of the country, and there will even be a reasonable chance that experts who have already left, return to live and work in the country [145].

**Human flight and brain drain in the Republic of Moldova**

In the Republic of Moldova, there are no legal regulations regarding the immigration of skilled workers and experts, as a result, there is a continuous increase in the number of academics and well-educated personnel especially in order to get suitable jobs and relatively high salaries. As a result of the immigration of experts and skilled workers, there are direct and indirect losses, especially from a health, educational and academic point of views [36, p. 7]. on the other hand, there is what is called "negative migration" which means the export of human capital which is considered in this context as an economic source. That is, the Moldovan immigrants work in other countries to which they immigrate, and the money they earn is sent to their families who live in Moldova.

According to international statistics, out of the total number of immigrants, the number of highly skilled and talented workers is very high. From the total number of immigrants in Moldova, according to IASCI study published in 2015, 28% are academics who graduated from universities and academic institutions, and 45% graduated from high school or with a professional education [39, p.39]. Actually, according to the Moldovan official data of the Bureau of Statistics of in 2017,

318,400 Moldovan migrants have immigrated and are working or are searching for a work abroad [55].

The average value for the Moldavian brain drain and human flight between 2007-2022 was 7.22 index points while the maximum index points was 8.4 in 2007, and the minimum index points in 2016 was 6.3 [174].

**Table 2.1. Brain drain and human flight index in the Republic of Moldova- 2022**

| Moldova | Human flight and brain drain [index: 0 (low) - 10 (high) |
|---|---|
| The last value | 7.8 |
| The reference | 2022 |
| The measure | The index point |
| The Source | The Fund Peace |

Source: [174]

According to table 2.1., which presents the index of the outflow and brain drain in the Republic of Moldova in the year 2022, the most recent index point value in 2022 was 7.8, and by comparing this index to the world`s average index based on 177 selected countries in the year 2022, the index point was much lower- 5.21 index point.

Actually, brain drain and migration of high-skilled personnel, impacts negatively the Republic of Moldova, and there is an immediate necessity for regulations and legality in this regard. Although only some of lately studies in this regard in Moldova show that the impact of brain drain and migration of highly skilled personnel in Moldova is positive, still, the existing data in this regard shows that this approach is biased, due to the fact that there is a big variety regarding the impacts of high-skilled migration on big and small countries [36, p. 12].

In big countries, the pool of talent is much bigger, and all a part of experiences talented personnel emigrate, that’s mean, the pool of talents does not deplete enough to cause a massive crisis in the internal labor markets in a global vision.

According to recent studies, negative effects of highly skilled migration occur, only if a specific volume of highly-skilled migration exceeds the optimal volume of brain drain. Seems, that migration has somehow the ability to stimulate increased population engagement at levels of higher education, and that's due to the benefits that individuals expect to invest in education by leaving the homeland and going abroad [214, p. 10].

Therefore, it's important to maintain the optimal level of brain drain in relatively small countries, On the other side, an increase in talents takes place with skilled and high skilled migration in relatively developing big countries such as China, Egypt, India and Brazil because big developing countries can maintain and keep the optimal balance of high skilled migration and

brain drain, and can create a level of perspectives which attract high skilled emigrants and the 'brains" that already left, to come back to their home lands [36, p. 12]. Hence, skilled emigration can be considered as an escape option in small developing countries, while in relatively big developing countries, skilled migration is being considered as a stepping stone for a better professional and high skilled personnel carrier.

For managing the brain drain in the Republic of Moldavia, the national authorities should pay intensive attention and offer an overall and practical reform and strategies in this regard. Such strategies are necessary for proposing solutions to the existing problems.

Actually, different researches show that recent graduates are more attracted to emigrating than specialists who have worked in the country for at least 10 years. Migrants who want to stay abroad are mainly married migrants, who are experienced for at least 10 years, mainly who live in urban regions and less from big cities such as Chisinau and Balti, and workers with low average income. Among men there is more tendency and intentions to emigrate than among women, and accordingly, among young people and especially in the age group between 25-29, which is almost 67% of the total population, there are more tendencies to emigrate than adults [224, p.50].

Therefore, young experts and specialists should be motivated in this context in order to encourage them to stay in their country. To this end, support measures should be used that will supplement the deficits and shortcomings, even partially, in at least the first 10 years of their career. Furthermore, the national authorities in the Republic of Moldova should identify essential positions mainly in the economic context, in addition to the means of support for young experts employed mainly in the economic field as I mentioned earlier, which should justify and attract their motivation to stay and work in their careers and specializations in their homeland.

Other important factors that have a direct impact on the immigration of experts and especially experts at the beginning of their professional career are the working conditions, the levels of salary they earn and relatively the extent to which it matches their occupations, opportunities for professional and personal growth, moral encouragement, and the adaptation of the educational model and offer of the academic and educational institutions to the requirements of the labor market field, since recent studies show that the academic educational model practiced in Moldova is a direct cause of brain drain from the country. Actually, the use of distance work can preserve experts, qualified and researchers even in poor funding conditions [238].

Actually, the national authorities of Moldova should even partially take steps and ensure the return of the Moldovan students who have completed their studies abroad in order to work in their home country and contribute to it, themselves and their families by bilateral treaties, besides, implementation of easier procedures for entrepreneurial activity and government support for

business initiatives carried out by Moldovan experts and skilled workers who have returned to their homeland, and support for service industries in which Moldova leads and can compete other countries, especially in the field of information technology (IT) and information technology services (ITES) [36, p. 15].

**The author summarizes the main reasons and factors which lead to international brain drain as bellow:**

International high qualified labor migration is due to economic and non-economic factors such as political, military, ethnic, and other factors.

The primarily economic factors are [11, 138, p. 26]:

1. The action of the law of capital accumulation, the law of capitalist population, and the law of uneven economic development of countries, etc., cause a disproportion in the distribution of the human resource in the marginal and regional dimensions of the world economy, i.e., a relative overpopulation in some countries and a shortage of labor force in others;

2. Significant differences in country indicators regarding working conditions, living standards of the population, business conditions, etc.;

3. The cyclical nature of global economic development, in particular, the asynchrony of the economic cycle in different countries;

4. Asymmetry of information resource development, uneven deployment of scientific and technological revolution, and structural crises.

Objective opportunities for private capital to attract the labor force of various nationalities associated with the development of TNCs enabled the launching of large-scale international production with a hierarchical division of labor of various groups of employees who, living and working in different countries, integrated into a single production and technological system of a private corporation. Over time, TNCs formed their domestic (internal) labor market, which is characterized by the permanent migration of various categories of workers (especially managers) from one country to another [58, p. 571, 59, p. 482].

Along with these predominant options, it is possible to denote infrequent, sometimes isolated facts of migration of intellectuals based on their own decision, or the choice of relatively close, comparable opportunities. This option can be conventionally defined as “free migration”.

### 2.2. An Analysis and Mapping of the Data in Context of the Israeli Academic Brain Drain with a Comparative Analysis to Countries Around the World

The "brain drain" phenomenon is related to Israeli academic lectures, academic students, skilled professionals and researchers in all specialties who went and still living abroad for at least

three years either for the purpose of studies and/or for the purpose of work [72, p. 129]. Recently, the phenomenon has become for the responsible parties and bodies in this context, a struggle aims to bring back the Israeli researchers, specialists and experts to their homeland by taking steps, moves, and structured and budgeted plans, but we are still far from achieving this goal, although only to a very small extent [26, p. 211].

In fact, the main reasons for this failure are mainly significant wage gaps compared to parallel countries and in the same fields and skills, deficiencies in the research field such as the lack of research standards and the lack of an advanced research infrastructure, along with many other obstacles, which led more Israeli experts and scientists to emigrate, live and work abroad mainly in research institutions. Most of them go abroad for post-doctoral training due to the fact that in Israel there are not enough standards for senior research faculty, and due to the reasons I mentioned earlier.

Therefore, the researcher finds it appropriate to discuss and analyze all the affecting and affected elements related to the discussed phenomenon, proposing practical and operative solutions to address the causes and problems in this regard [161, p. 9].

**The Bologna's reform and its implementation in Israel-**

Bologna's reform began to operate in the academic world in Europe in 1999. The State of Israel has submitted a request to join the company in the years 2007 and 2008. The Bologna process was originally supposed to create a "common academic space" that will be as the new spirit of higher education in continental Europe, and a further stage in the whole world.

From the outset, the project received its name - the "European Higher Education Area"- EHEA. Today, about 47 Member States work to create a uniform and transparent level training framework and the structure of academic degrees, to promote several effective reforms, and to promote and develop joint systems degrees, and the most important part is encouraging Academic mobility of students through recognition of prior learning [171].

**The implementation of the Bologna reform in Israel**

The reform has deeply affected the significance of the State of Israel. Although, the state of Israel promotes diplomatic relations and cooperation in higher education with the EHEA and the European Union, till 2019, Israel received a negative response and couldn`t be a full partner since there are major obstacles facing it, and also because the European Union argues that Israel is not a signatory to the European Cultural Convention [164, p. 6].

Some of the barriers are related to the reform itself and the other part is related to things within the State of Israel. These barriers are mainly language barriers, cultural differences, lack of uniform standards in the Israeli Universities, and other fundamental barriers such as adapting

training and qualifications circles as the reform requires, and strengthening of joint initiatives in research and academic processes. The European Union argues that Israel is not a signatory to the European Cultural Convention. Therefore, the State of Israel has revised the trend to adapt to the European system and Bologna program and held major changes focused on the principles of reform especially the Model uniform training framework and structure of academic degrees which means a full Interactions between the three circles of academic studies, Bachelor's degree (BA), Master's degree (MA), and Ph.D. (Ph.D.). Actually, all Member States should grant degrees in accordance with the specified circuit [172].

After reviewing sites from various Universities, institutions, and colleges, and getting relevant data, it's clear that the Israeli academic institutions are offering various programs in English for international students:13 undergraduate programs full activity in English, 65 active programs in full English graduate, and summer courses and programs - summer courses or short programs designed for international students (in English and in Hebrew). Even many institutions invite students to choose to study a variety of courses in English in English and build their own personal programs, and other international students enrolled in regular programs of institutions [186, p. 68].

It`s important to note that some of the foreign students in the Israeli Universities Are Jewish and they know the Hebrew language even if not well, and others have families in Israel and so family-supporting.

**International Relations and Academic – Economic Cooperation**

**Foreign students and highly qualified specialists in Israel**

Before the start of the mobility of students, researchers, and specialists between many countries, and operating international programs, there was a desire to come to Israel. Actually, raising the academic quality depends on the number of students that reach a high level of education including accommodating foreign students, since the ability to source income from such a policy depends on the tuition from those students and the services provided to and by them. Actually, the Israeli student's benefit depends on the level of exposure to international students [121, p. 18, 122, p. 20].

The reform of academic mobility takes part in partnership with the academic programs have been before the year 2000. Recently, not only in Israel but also in many other countries around the world, we have witnessed a significant increase in the academic mobility of students and researchers, and students are interested in joining partnership programs that run in these countries. for example, students who study in Israel are interested in joining programs such as Erasmus Mundus programs and others [144, p. 13]. The Author found that parallel Universities and

institutions in different countries around the world combine academic programs. In Israel, several Universities and Institutes have taken an important part in such collaborative programs [142, p. 54]. For example:

The Technion institution one of the best academic institutions in the world has conducted academic relations and joint certification with over 32 countries around the world [148, p. 19, 223]. Ben Gurion University manages relations, training, and certification programs with over 50 countries at three levels of degree, Faculty of Political Sciences, health promotion programs in the community, and Business Administration and Global Economics in the world [115, p. 12]. Also, Tel Aviv University has academic relations, training, and certification programs with 8 countries mainly master's degrees in all levels and fields such as medicine [149, p. 17, 225].

**International programs operated in Israel– Erasmus +, Tempus- See Annex No' 21**

The EU programs and the Erasmus+, includes seven EU programs. The fields in these programs are education, training, youth; and support for Sport. But, as an integrated program, it offers more opportunities for international cooperation across the fields [185]. The Erasmus program intends to improve the level of skill and vocational training, as well as modernizing in the academic, education and training fields, besides youth work institutions. The Erasmus program supports transnational partnerships in these contexts to enable and improve collaborations and to bridge and coordinate between education and employment, which should reduce the gap related to the level of training and skill of the employed. In addition, this should promote and support the national moves for modernization in this context. For instance, in the sports field there are supports for popular projects and cross-border challenges such as the fight against match fixing, violence and racism.

Actually, we can get a better understanding of the international student's aims, from their primary target when they arrive in Israel: looking for "Academic Experience" (students studying for short periods and programs such as summer courses, Erasmus, and student exchanges), studying in the full program (full undergraduate students. B.A. and M.A. students), or looking for academic research - students with a master thesis, doctoral and post-doctoral [184].

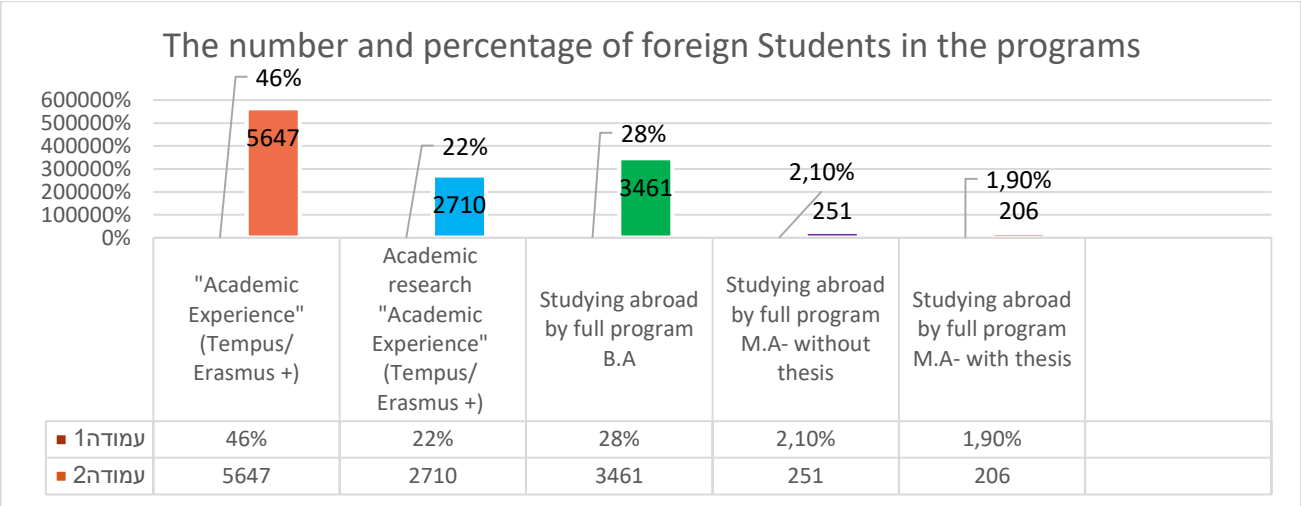



**Fig. 2.2. The number of foreign students who joined international programs in Israel in the Academic year 2019- 2020**

Source: Made by the Author from source [122, 183, 185]

Figure 2.2. presents a comparison of the number and percentage of foreign students joined international programs in Israel in the academic year 2019- 2020 in Israel. According to the comparison and presented data in figure 2.2., it's obvious that the number of foreign students studying abroad by full program- M.A with and without thesis is so small (206 and 251 students respectively). On the other hand, the number of academic experience (Tempus/Erasmus+) is the highest (5647, 46%), and then the numbers of students who study abroad by full program B.A (2461, 28%), and academic research "Academic experience" (Tempus/Erasmus+) (2710, 22%).

By comparing Israel to other countries such as Australia, Britain, Austria, and Belarus, which promote the issue of the idea and bringing many foreign students to their countries and universities, the State of Israel cannot surpass the number of significant percentages.

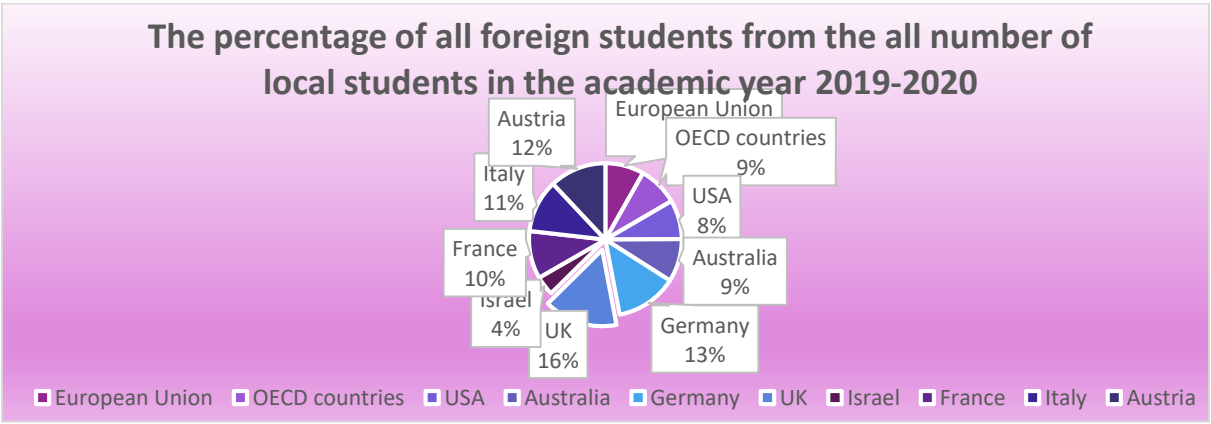
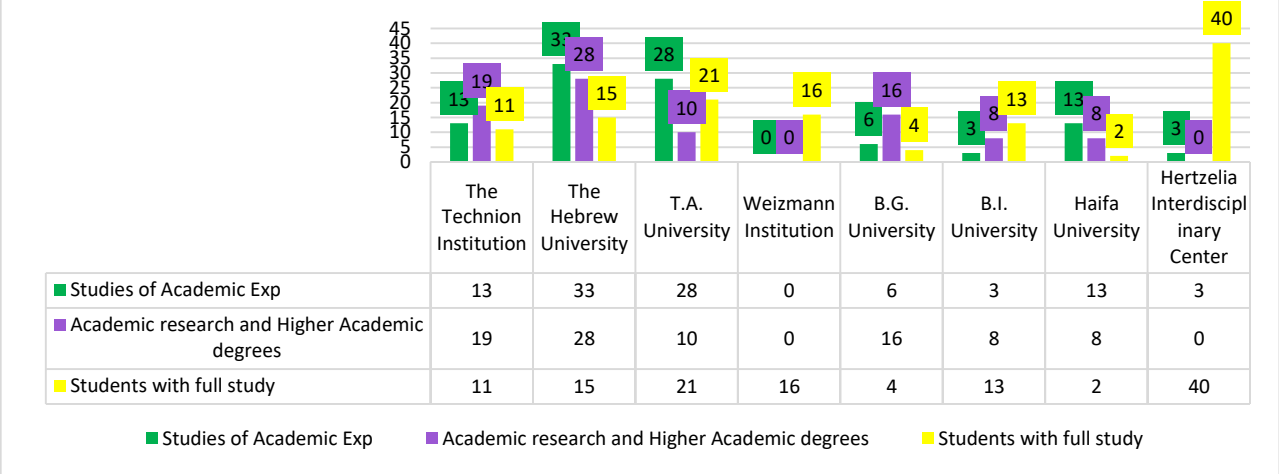



**Fig. 2.3. The percentage of all foreign students from all number of local students in the academic year 2019-2020**

Source: Made by the author from sources [40, p. 30, 110, p. 34, 207]

Figure 2.3. presents a comparison between developed countries regarding the percentage of all foreign students from the total number of local students in the academic year 2019-2020. It is clear that the UK has the largest percentage (16%), while Israel has the smallest percentage (4%). It is clear that in all the presented countries shown in the figure, except Israel, the percentages are almost identical (8%-16%).

It's important to present numerical data and information about foreign students from various countries studying in the Israeli Universities and institutions, according to the international programs the institutions offer and enable, with comparison to different universities and institutions.




| | The Technion Institution | The Hebrew University | T.A. University | Weizmann Institution | B.G. University | B.I. University | Haifa University | Hertzelia Interdisciplinary Center |
|---|---|---|---|---|---|---|---|---|
| Studies of Academic Exp | 13 | 33 | 28 | 0 | 6 | 3 | 13 | 3 |
| Academic research and Higher Academic degrees | 19 | 28 | 10 | 0 | 16 | 8 | 8 | 0 |
| Students with full study | 11 | 15 | 21 | 16 | 4 | 13 | 2 | 40 |

**Fig. 2.4. Foreign students in the Israeli Universities and Institutions – 2019-2020**

Source: Made by the Author from sources [122, 179]

1. In Weizmann Institute all the foreign students are researches -the largest percentage of advanced academic degrees and academic research
2. In Herzliya Center is the largest percentage of full study.
3. In the Hebrew University is the largest percentage of the Academic Experience (Erasmus program).
4. In the University of Tel Aviv is the largest percentage in academic experience and full studies.

The author will make use of statistical tests, and elements of data analysis such as the Pearson Correlation Model, and the regression model. The author hypothesizes that there are primary causes and factors, that affect the brain drain of Israeli students studying abroad and as a result affect the Israeli labor market, and he assumes that the relationship between the two parameters is linear, so, the equation of a straight line - linear model (Y=ax +b) can be used as a mathematical method in order to analyze and locate the relationship between the two parameters: the independent variable X which explains the dependent variable (the main and relevant reasons that

led to the Israeli mobility of higher education students and brain drain) and the dependent variable Y (The extent of the mobility of higher education students and specialists so-called brain drain).

The author hypothesizes that relatively low salaries, high costs of living, high levels of taxes, high levels of unemployment, and many obstacles in the academic system, besides the difficult admission requirements, are the most explanatory variables, and by using and analyzing the linear model, the Pearson Correlation Model, and the regression model, the main causes/explanatory variables which lead to the brain drain and academic mobility will be determined.

The linear equation will compute the straight line passing through various points, which represent different expected results, and the Pearson correlation between coefficients will measure the intensity of the relationship between two various variables- factors by using a mathematical function that serves to assess the extent to which it will be possible to describe the relationship between the two variables.

Actually, the model will serve in analyzing related elements, factors, and various statistical samples which assists in giving answers to the research questions in the hope of confirming or refuting the research`s hypotheses and stating conclusions and recommendations. See tables 3.5, 3.6, 3.7, 3.9, 3.16, 3.17, 3.18, figures: 3.5, 3.10, 3.12, 3.13, and Annexes No' 15, 31, 32, 36, 43.

For this purpose, the author found it appropriate to present and compare the total numbers of inbound and outbound students in and out of Israel, and the trend of change- an increase or decrease of demand. The UIS data on the mobility of students shed light on the shifting demand for higher education, particularly in the developing world- The global flow of tertiary-level students in 2022, where do students go to study?, and where do they come from? [232] - See **Annex No' 24** and **figure 2.5**. that present numerical data and trends in this regard.

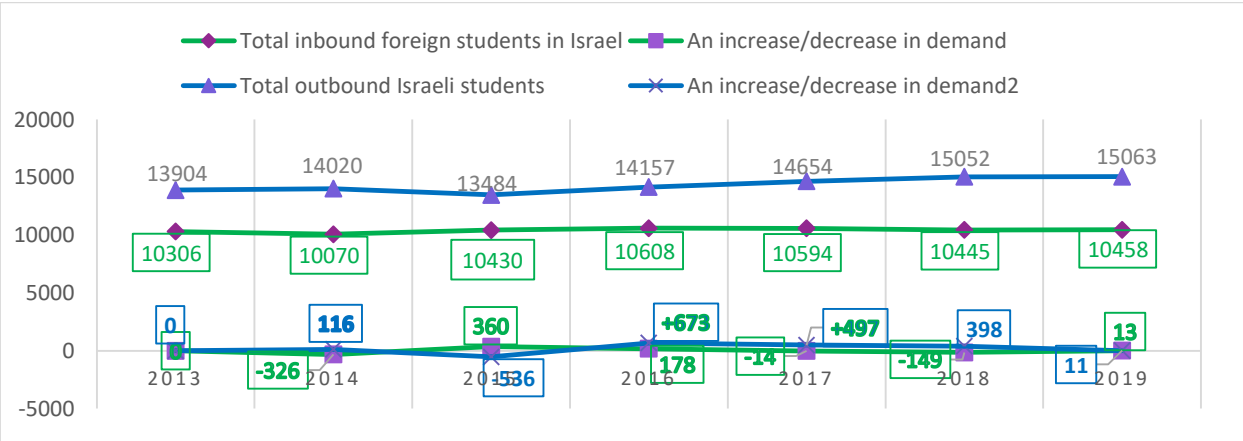



**Fig. 2.5. The total inbound foreign students to Israel and total outbound Israeli students 2013-2019**

Source: Made by the author from sources [200, 207, 226, 234]

❖ Numerical analyzes from figure 2.5.:

The trend (increase or decrease) **of total inbound foreign students in Israel:**

In the year 2014- 10,070 students (decrease of **-236** students from the year 2013).

In the year 2015- 10,430 students (an increase of **+360** students from the year 2014)

In the year 2016- 10,608 students (an increase of **+178** students from the year 2015)

In the year 2017- 10,594 students (decrease of **-14** students from the year 2016)

In the year 2018- 10,445 students (decrease of **-149** students from the year 2017)

In the year 2019 – 10,458 students (an increase of **+13** students from the year 2018)

The trend (increase or decrease) **of total outbound Israeli students:**

In the year 2014- 14,020 students (an increase of **+116** students from the year 2013).

In the year 2015- 13,484 students (decrease of **-536** students from the year 2014)

In the year 2016- 14,157 students (an increase of **+673** students from the year 2015)

In the year 2017- 14,654 students (an increase of **+497** students from the year 2016)

In the year 2018- 15,052 students (an increase of **+398** students from the year 2017)

In the year 2019 – 15,063 students (an increase of **+11** students from the year 2018)

The trend (increase or decrease) demand:

1. There is an increased demand of the total outbound Israeli students for studying abroad- increase of +1159 students between the years 2013-2019.

2. There is a small increased demand of total inbound foreign students in Israel- increase of +152 students between the years 2013-2019.

**Table 2.2. The Inbound Students to Israel between the years 2016-2021**

| The Inbound Students in Israel between the years 2016-2021 | | | |
|---|---|---|---|
| | European Countries | Australia and Countries of East Asia | North American Countries |
| 2016 | 2100 | 24 | 4100 |
| 2017 | 2150 | 105 | 4260 |
| 2018 | 2230 | 120 | 4580 |
| 2019 | 2225 | 122 | 4557 |
| 2020 | 2204 | 118 | 4014 |
| 2021 | 2360 | 127 | 5032 |

The source: Made by the author from sources [200, 207, 226, 234]

According to the presented data in table 2.2. which presents the Inbound Students to Israel between the years 2016-2021, in an overall look, while there is an increased demand of students from North America (Canada and the USA) and from European countries, there are low and stable demand of students from East Asia and Australia (despite from 2016 to 2017).

**Tuition fees in the Israeli Higher Education Universities and Institutions-**

Foreign students studying at institutions of higher education in Israel receive academic rights and conditions equal to those of Israeli students. The CHE does not differentiate between actual and subsidizes Israeli students, and looks at them as part of the budgeting model. But, the Commission "Malz" dealt by 1996 with determining the amount of tuition and student assistance establishments of higher education institutions, has defined that "foreign citizens Students pay high tuition fees at 25% of the foregoing". The actual tuition charged in these programs by universities is actually close to the ceiling in the limit. But in the situation of off-budget programs, there is no clear arrangement and there is a difference between the various academic institutions [179, p. 26].

**Table 2.3. Foreign students` tuition fees in Israel in the academic year 2020- 2021**

| Academic institution | Academic studies |
|---|---|
| Technion institution | Full program: 22400 $ for a year, and additional costs of about 3800 $ |
| Weismann institution | Full program: 23600, and additional costs of about 4600 $ |
| Tel Aviv University | Full program: BA about 20000-21000, MA about 39000-42000, and additional costs of about 5100 $ |
| Bar Ilan University | Studying for Academic Experience: 7500$, for full program: 14600$ for a year, and Additional costs of about 3900 $ |
| Ben Gurion University | Studying for Academic Experience: 4600$ for a year, and additional costs of about 1200$. Full program: 13500 $, and additional costs of about 5500$ |
| Haifa University | Full program: 13800 $, and additional costs of about 3700 $ |

Source: Made by the Author from sources [122, p. 26, 183, p. 22, 227]

Table 2.3. lists the level of tuition fees in the academic year 2020- 2021 for foreign students in the proposed programs and academic studies in the Israeli academic institutions and universities. The tuition fees vary between the academic institutions, and so do the programs which ran.

In 2013, the Higher Education Council (HEC), started a comprehensive plan for developing academic relations with India and China and have strengthened the Israeli academic status in the world. The program is aimed to promote two courses: Joint research grants and fostering collaborative research between scientists from China, India, and Israel, programs to promote the absorption of students and post-pick-up sticks outstanding (Scholarships for post-doctoral students from China and India for outstanding Israeli universities, and plan to receive outstanding students from China to study BA and MA), and Plan to receive outstanding students from China and India to study summer courses in Israel [199].

In terms of academic institutions, the outstanding advantages according to Yemeni [164, p. 5] are:

1- It's an important tool for the reduction of academic boycotts.

2- It's an important tool for raising the academic quality because of the global market accessibility for students and consequently also for the staff and faculties.

3- It leads to strengthening international reputation.

4- It also leads to diversify the sources of income and the sources of possible profits.

**The Academic Mobility of Israeli Higher Education Students-**

According to recent data from the Council for Higher Education, the Central Bureau of Statistics, including cross-checking with data from the UNESCO, out of the total number of academic students, the number of Israeli students studying abroad is relatively considered very high. In 2019, it was about - **15**,**210** students [74].

**In fact, according to** BEN -DAVID **and** HALL **the relevant main reasons for academic mobility are** [28, p. 228, 102, p. 942]**:**

1. Expand their experience due to their studies and the fact that you were abroad during your studies.

2. To challenge their academic training and consequently a renewed evaluation of their educational and occupational goals.

3. To expand and deepen their personal and intellectual maturity by imparting flexibility, personal, interpersonal and intercultural communication skills, ability to adapt in any context and optimal coping, and personal resilience.

4. An opportunity to experience various contexts related to occupations and academic professions in terms of possible globalization abroad, which will improve the future occupations they will choose and engage in, and personal enrichment academically and socially.

According to Cohen-Goldner, in addition to three main categories of reasons that have been identified as bringing the Israeli student to immigrate, which are academic, professional and personal motives, the experience the student has abroad is an important category in this context. In fact, personal motivation is also related to our desire to have fun, and since students have no obligations on a personal level such as a relationship, or on a professional level as some of the students emphasized, this period is an experience for them. Actually, the student's age is on average 21 years old, most of them are single (marital status) and undergraduate students and relatively few are students for doctoral and master's degrees (the stage in their education) [42].

For the majority of students, the main reason for departure is academic goals. These are the desire to learn and improve another language and the desire to specialize in a particular field.

Moreover, professional motives are presented less vividly, while the desire to make an international career, learn other ways of doing business and open professional doors is expressed quite strongly [205].

Actually, according to Wolinsky [163], there are advantages and disadvantages due to the demand for Academic mobility. The advantages are:

1. Admission requirements - Studying outside of Israel allows them to acquire education abroad in the fields they especially want, which was impossible in Israel because they did not meet the requirements of the Israeli academic institutions. For example, it is so difficult to meet the admission requirements and study in faculties such as medicine, veterinary medicine, dentistry, engineering, computer programming, and psychology.
2. The fields of study - studying abroad reveals and enables more diversity of the fields of study, such as studying acting in California, fashion design in Milan, or cooking in France.
3. The level of studies - believing that teaching standard abroad is higher than in Israel, especially in professions such as medicine and business administration. Actually, several academic institutions around the world boast the most high-quality of academic education such as Oxford and Harvard universities in England, the Sorbonne University in France, and others.
4. The academic institutions are located in the centers of the world nearby the world's leading activities.
5. Employment opportunities and the expansion of knowledge by allowing access to the local and regional labor market. If so, the student can in parallel, study and also work in the destination country.
6. Improving the professional career and their professional status by Studying Abroad.
7. Gain a new language, independence, and self-experience- studying abroad enables knowing and mastering another language, independence, and the experience of different cultures.
8. The unstable security situation in the State of Israel, along with the particularly difficult socio-economic situation.
9. The sense of freedom and liberation from reserve duty (for Jewish and some other citizens like Druze and Bedouin).
10. The very high costs of living especially the high housing prices, and the high taxes.

The disadvantages of the demand for Academic mobility according to GURI – ROSENBLIT and WOLINSKY are [74, 163]:

1. The loss of study grants especially for doctoral and post-doctoral studies.
2. The loss of study grants for graduates of military service and civilian service from 2012

in 16 academic institutions which enables tens of scholarships/grants/loans while studying.

3. Few options to get a job- And this makes it even more difficult for students to live. Socio-economic problems are often direct reasons for engaging in illegal jobs and things.
4. Costs of living - students studying abroad are generally required to pay housing costs, living expenses, travel costs, health insurance along with other costs in the host country, while these costs may constitute a heavy burden and make it difficult for them.
5. The Tuition fee costs may be very expensive although recently we have witnessed a significant easing and economic aid, expansion of the basket of scholarships and loans offered to foreign students.

**The Israeli Students' Academic Mobility and Brain Drain by Countries, Universities and Faculties**

**The Universities and Faculties most Sought After by the Israeli Students-**

1. According to CBS, the most sought-after faculties are medicine, dentistry, pharmacy, veterinary, nursing, law, business administration, engineering especially computer engineering and architecture, sciences and mathematics, fashion design, and art [178]. Unlike in the 1980s, today globalization and the free market have made higher education abroad options available to almost all Israelis. The most desirable countries for Israeli students were the United States, Italy, Hungary, Germany, Canada, Moldova, Russia, Jordan, the Palestinian Authorities, Romania, Ukraine, Britain, the Netherlands, Australia, and Slovakia. Actually, Israeli students are almost in all the countries around the world [179, p. 13].

Actually, the topics and faculties most sought-after by Israeli students, and the country's most sought-after in the three academic years, 2016-2017, 2017-2018, and 2018-2019, including specifying the admission requirements for studies, the language of study, tuitions fees, and the average costs of living are presented in **Annex No' 25**. It's obvious that the most expensive tuition fees are in the U.S. universities and then Jordan and the Palestinian authority universities. But, nevertheless, the demand for studies in these countries is still considered the highest. For Jewish students, the United States is the first preference, while for Arab students, the Jordanian universities and the universities in the Palestinian Authority, especially the "American" University in Genin and the "Al Nagah" University in Nablus are the first preference.

**The Countries and Regions most Sought After by the Israeli Students Between the years 2011 - 2019:**

The Author of the thesis, based the presented and analyzed data on professional sources such

as the OECD data, the UNESCO data, *the Economic Innovation Group, Economic Journal*s, the Israeli Center for Higher Education, and the Central Bureau of Statistics database. The data is presented on the basis of geographic regions and is distributed in accordance to continents, countries, and relevant education clusters [181, 197, 198, 199, 200, 201].

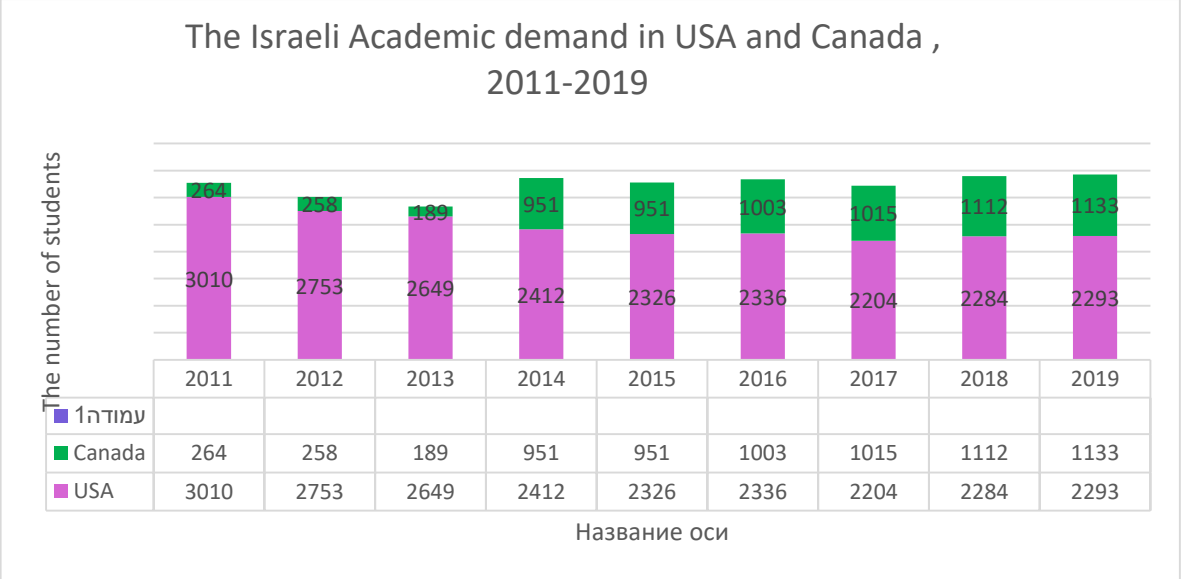



**Fig. 2.6. The demand of Israeli students for academic studies in USA and Canada (2011 -2019)**

Source: Made by the Author from sources [27, 179, 192, 197]

According to the proposed data in table 2.6., it's still obvious that the Israelis` student demand for academic mobility to the U.S.A and Canada is relatively high although there was somehow decreased demand in specific periods- See also **Annex No' 27**.

1. There is a trend of decreased demand for Canada between 2011 to 2013, and then increased demand in 2014, stability in 2015, and then increased demand between 2016 and 2019.

2. In the United States, there was a decrease in demand from 2011 to 2017, and then an increase between 2018 and 2019.

3. The main reasons for the decline in demand for US academic mobility are high tuition fees and high costs of living. The average tuition for academic studies in the United States is 10,000- 55,000 USD for academic year, according to the institution, and the average costs of living is 1000-2000 USD for a month- See **Annex No' 25**, p. 201.

**The demand of Israeli students for studying in Eastern Europe countries**

In Eastern Europe, the countries with high demand for academic mobility from Israel between the years 2012 – 2018 are: The Republic of Moldova, Romania, Hungary and Slovakia.

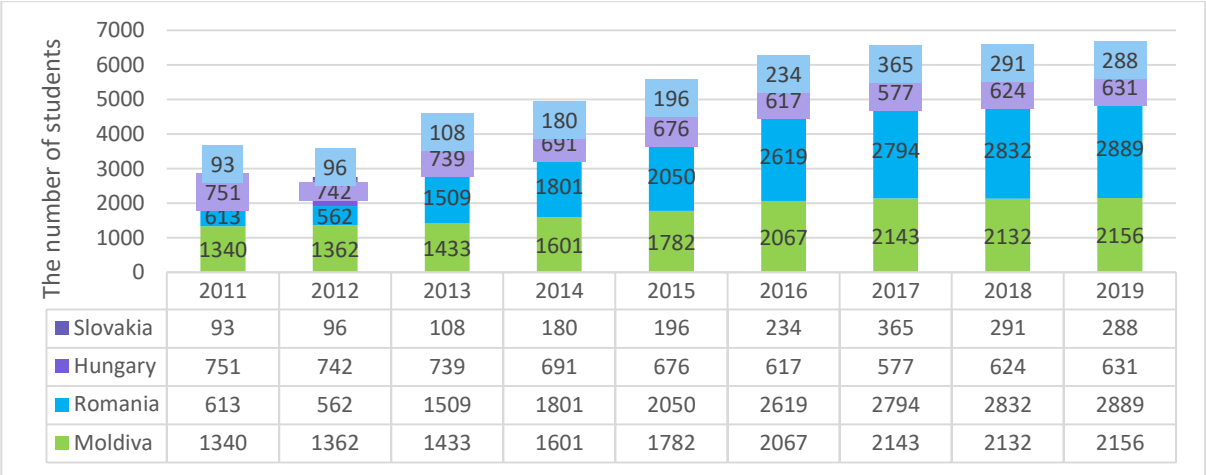



**Fig. 2.7. The Israeli students` academic mobility to Eastern Europe countries, 2011–2019**

Source: Made by the Author from sources [179, 187, 190, 192, 197, 230, p. 81]

1. In all these countries, there is an increase in demand of Israeli students specially in Romania and the Republic of Moldova, although in Slovakia there were a small decrease in 2018 and 2019.

2. The most significant increase in demand is in Romania- increase of 2276 students (371%) between the years 2011 and 2019, and in the Republic of Moldova- increase of 816 students (61%).

**Israeli students` academic mobility to Western Europe countries-**

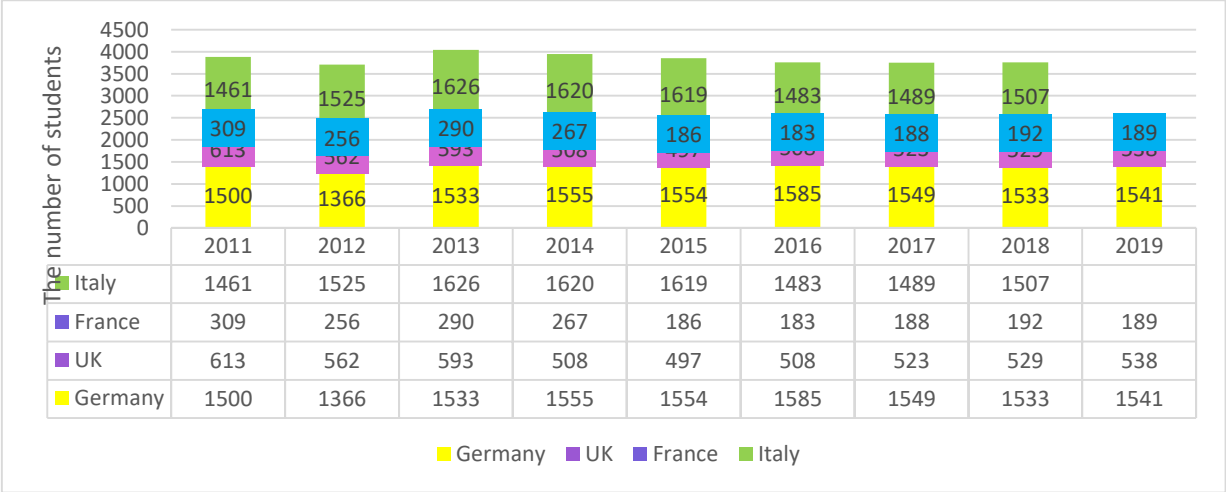



**Fig. 2.8. The Israeli students` academic mobility to Western Europe countries, 2011 – 2019**

Source: Made by the Author from sources [179, 187, 190, 192, 197, 230, p. 83]

An analysis of the figure 2.8. indicates:

1. From the data, it's clear that Israeli students` academic mobility to Western Europe countries are high.

2. Despite the high level of the Israeli students` academic mobility to Western Europe countries, there are significant differences between the different levels of demand for Israeli students of each country.
3. In Italy and Germany there are raising demand while in Britain and France there are declining demand. In Germany there is positive raising demand from 1500 students in 2011 compared to 1541 Israeli students in 2019, In Italy there is also increase demand from 1461 students in 2011 to 1512 Israeli students in 2018).
4. In France, there is decline in demand -from 309 students in 2011 to 189 in 2019.

**The demand of Israeli students for academic studies in Arab countries:**

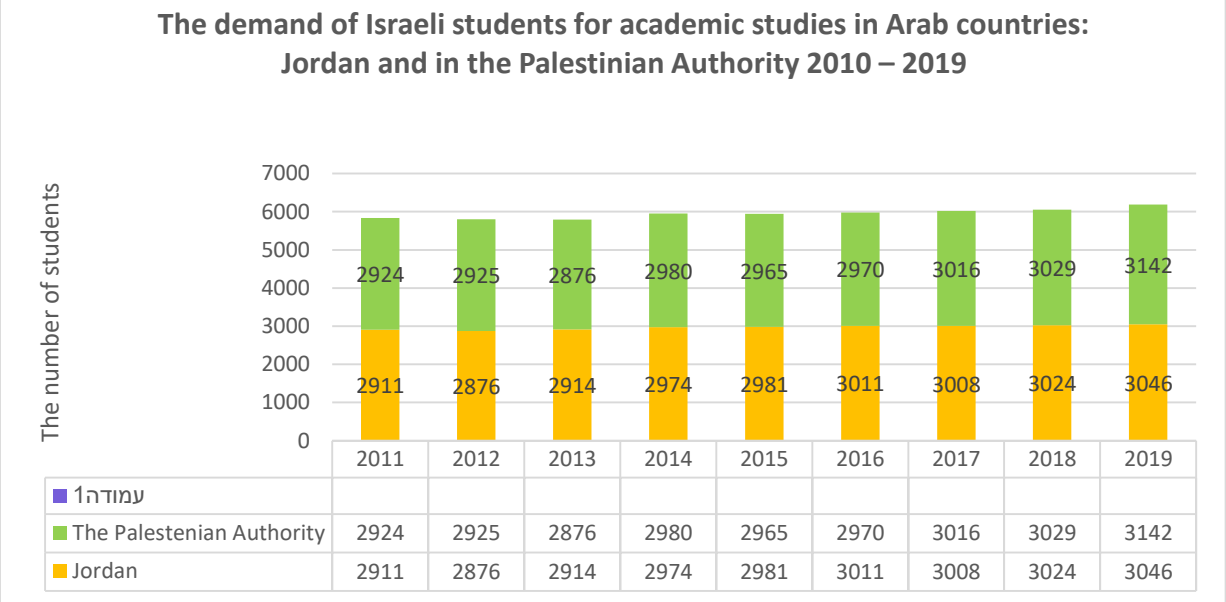



**Fig. 2.9. The demand of Israeli student for academic studies in Jordan and in the Palestinian Authority 2010 – 2019**

Source: Made by the Author from sources [100, 182,183, 187, 205]

An analysis of figure 2.9. indicates:

1. There is a trend of an increase in demand for academic studies in Jordan and in the Palestinian Authority universities. both of them are with a very high demand for academic mobility. The studies are in English and they are offered to Israeli Arab citizens.

2. The Licensing Exams' success rate of students of health trajectories studying in Jordan and in the Palestinian Authority universities is so high in Israel.

3. The tuition fees in Jordan and in the Palestinian Authority universities are very high and it`s about 28,000-32,000 $ for a year.

4. Most of the students come from rich Arab families, and they study in the faculties of medicine, software engineering, law, dentistry, and nursing.

**Table 2.4. The Academic mobility by Area between the years 2013 – 2021**

| The Academic Year | North America and Western Europe | Central and Eastern Europe | Jordan | The Palestinian authorities |
|---|---|---|---|---|
| 2013-2014 | 7510 | 2619 | 2215 | 1633 |
| 2014-2015 | 7561 | 3013 | 2316 | 1808 |
| 2015-2016 | 7510 | 3227 | 2349 | 1916 |
| 2016-2017 | 7511 | 3034 | 2651 | 2210 |
| 2017-2018 | 7498 | 3215 | 3151 | 2706 |
| 2018-2019 | 7572 | 3641 | 3040 | 2811 |
| 2019-2020 | 7611 | 3689 | 3233 | 3206 |
| 2020-2021 | 7705 | 3698 | 3124 | 3340 |

Source: Made by the Author from sources [27, 179, p. 12, 197, 207, 232, 235]

Analysis of the presented data in table 2.4. (See also **Annexes No' 24 and 27**):

1. It's obvious that the largest amount of demand is focused on: the Palestinian authority, Jordan, Romania, USA and Moldova.

2. In North America and Canada, there is a stable trend over the years, with a minor rise. The reasons of the non-increase in North America are due to the high tuition fees and the high costs of living.

3. In Central and Eastern Europe, we identify a year with high demand (in 2020) due to the high demand in the state of Latvia. After the crisis fell against the university, the number has stabilized [230, p. 82].

4. Some countries are not attractive for Israeli students such as East and South Asia, and South America.

Actually, according to the presented data in table 2.4.**:**

1. by comparing the number of applicants for academic studies outside of Israel we notice a clear increase in demand for academic studies in academic institutions outside of Israel, alongside the increase in the number of target countries. No doubt, these numbers are large relative to the number of the young population of students in the Israeli universities, and according to the total outbound Israeli students [27, p. 10]- **Annex No' 28.**

2. It is important to note that in the last twenty years, the three preferred target countries for Israeli students were North America and Europe, followed by Eastern Europe, and then Arab's countries (presented by Jordan and the Palestinian authorities).

Actually, the Israeli high demand for academic mobility causes a very high monetary loss mainly due to the high financial expenses that Israeli students spend on their studies abroad.

Table 2.5. and figure 2.10. present data about the monetary losses due to the Israeli academic mobility in the academic year 2020-2021.

**Table 2.5. The Israeli academic mobility and its impacts on the monetary losses in the academic year 2020-2021**

| State | The number of Israeli students (2020 – 2021) | Average tuition fees in thousand USD | Total loss per a year in million USD |
|---|---|---|---|
| The United States of America | 2,298 | 34 | 78 |
| Canada | 1,152 | 16.3 | 18.8 |
| Jordan | **3,124** | 31.5 | 98.4 |
| the Palestinian Authority | **3,340** | **35.8** | **119.6** |
| Germany | 1,540 | 10.5 | 16 |
| Romania | 2,804 | 4 | 11.2 |
| Moldova | 2,205 | 3.8 | 8.4 |
| | | | **Total Loss for a year 350.4** |

Source: Made by the Author from sources: [50, 107, 181, 197, 204]

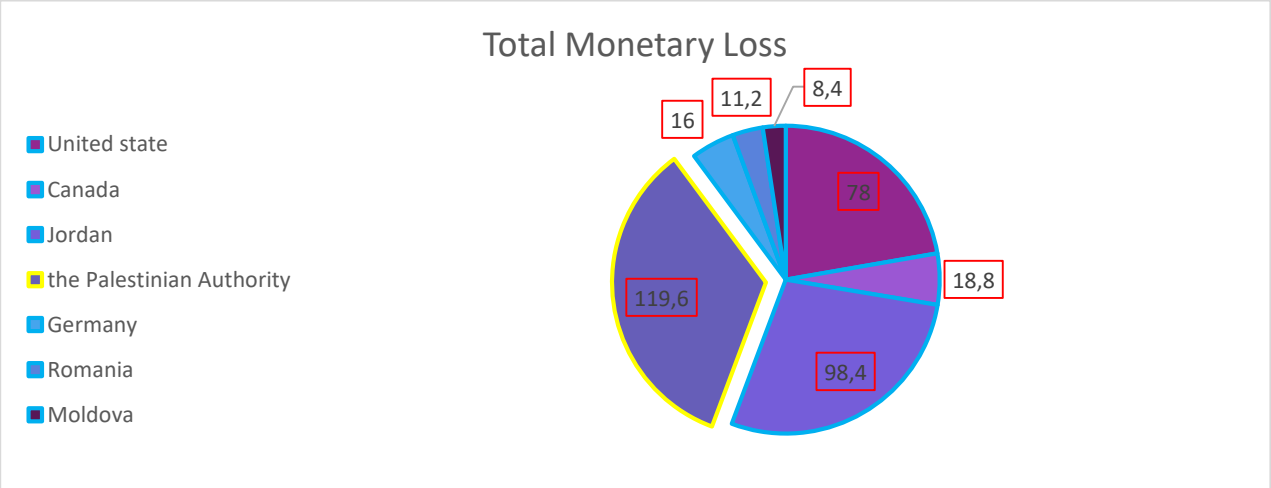



**Fig. 2.10. The total monetary losses due to the Israeli academic mobility in the academic year 2020-2021**

Source: Made by the Author from sources [50, 107, 181, 197, 204]

According to table 2.5. and figure 2.10., in the academic year 2020-2021 the academic mobility to the Palestinian authority was the highest (3,340 Israeli students) among other countries, while the average tuition fee in thousands of USD was about 35.8, and the total monetary loss was 350.4 USD millions. Actually, the total Loss for a year were about **350.4 million USD.**

After the Palestinian Authority, Jordan was in second place with 3,124 Israeli students, then Romania with 2,804 Israeli students, the United States of America with 2,298 Israeli students, the

Republic of Moldova with 2,205, and so.

It's important to note that, although the number of Israeli students in Canada was the lowest (1,152), the average tuition fees were relatively high compared with other countries.

The following table (table 2.6.) presents the **Pearson correlation coefficients** and their significance.

**Table 2.6. The Pearson correlation between the number of students leaving to the different main countries**

| The Pearson correlation between the number of students leaving to different countries<br>Pearson correlation (p - value<0.0001) | | | |
|---|---|---|---|
| Outbound students by countries<br><br>The main countries | Students leaving to Central Asia | Students leaving to South Asia | Students leaving to Western Europe |
| Students leaving to Jordan | 0.703 | -0.698 | - |
| Students leaving to the Palestinian Authorities | 0.724 | -0.61 | - |
| Students leaving to North America | -0.853 | - | -0.536 |

Source: Made by the Author

**The correlation between coefficients according to Table 2.6. which referred to the Israeli student's destination:**

I. There is a high positive correlation of **0.703** between the number of students leaving to Jordan and the number of students leaving to Central Asia.

II. There is a high negative correlation of **-0.698** between the number of students leaving to Jordan and the number of students leaving to South Asia.

III. There is a high positive correlation of **0.724** between the number of students leaving to the Palestinian authorities and the number of students leaving to Central Asia.

IV. There is a high negative correlation of **-0.61** between the number of students leaving to the Palestinian authorities and the number of students leaving to South Asia.

V. There is a high negative correlation of **-0.853** between the number of students leaving to North America and the number of students leaving to Central Asia. This means that Central Asia and North America are possible competitors.

VI. There is a high negative correlation of **-0.536** between the number of students leaving to North America and the number of students leaving to Western Europe.

The regression model:

**Table 2.7. The number of outbound students from all local students, 2015-2021**

| The Year | The total number of students in Israel | The number of outbound students |
|---|---|---|
| 2015 | 245,719 | 13,904 |
| 2016 | 252,788 | 14,020 |
| 2017 | 257,145 | 13,484 |
| 2018 | 288,352 | 14,157 |
| 2019 | 309,870 | 14,654 |
| 2020 | 310,012 | 15,052 |
| 2021 | 336,201 | 16,244 |

Source: Made by the Author from sources: [197, 200, 207, 226, 234]

According to table 2.7. we can notice that:

1. There is an upward trend in the number of students in Israel- An increase of 36.8% between 2016 and 2021.
2. There is a trend of decrease of the percentages of outbound students from all students- from 5.7% to 4.8%.

A report of the OECD recently published in September 2020 ranked Israel among the first places in the world, after Canada and Luxembourg in the proportion of citizens aged 25-64 with high academic education (51%)- See table 2.8 [228, 236, 237]- **Annexes No' 3, 4**.

**Table 2.8. The proportion of citizens aged 25-64 in different countries, with high academic education in 2020**

| The Country | Citizens aged 25-64 with high academic education in 2020 (by %) |
|---|---|
| Italy | 20 |
| Germany | 30 |
| France | 39 |
| OECD | 39 |
| USA | 49 |
| **Israel** | **51** |
| Luxemburg | **52** |
| Canada | **59** |

Source: [ 228, 236, 237]

Analysis of the presented data in table 2.8.:

According to table 2.8. which presents the proportion of citizens aged 25-64 in different countries, with high academic education in 2020, although Canada and Luxemburg are in the first and second places respectively (59% and 52% Citizens aged 25-64 with high academic education), Israel maintains its high place (51% of all Israeli citizens aged 25-64 with high academic education in 2020), for several years in a row. This confers academic uniqueness to the state of Israel on all that is implied. It's obvious from the table that Italy is in last place (20%).

**Table 2.9. The budget of the higher education system in Israel, 2010- 2022**

| The year | The budget of the higher education system (In billions of shekels) |
|---|---|
| 2010 | 6.9 |
| 2020 | 11.8 |
| 2021 | 12.3 |
| 2022 | 12.5 |

Source: Made by the Author from sources [179, p. 20, 183, 201, 228, 233]

Analysis of the presented data in table 2.9.:

According to table 2.9., the budget of the higher education system in Israel between the years 2010 and 2022 is in an upward trend. This is also reflected by the high costs of living in all aspects and fields in the State of Israel - a heavy burden of taxes, housing costs, alimony, and more.

**Table 2.10. The number of students from the Israeli Arab society, 2010- 2020**

| The year | The number of students from the Israeli Arab society |
|---|---|
| 2010 | 25,951 |
| 2011 | 29,046 |
| 2012 | 31,157 |
| 2013 | 34,225 |
| 2014 | 37,217 |
| 2015 | 40,351 |
| 2016 | 43,311 |
| 2017 | 46,332 |
| 2018 | 48,627 |
| 2019 | 51,166 |
| 2020 | 53,561 |

Source: Made by the Author from sources [200]

Analysis of the presented data in table 2.10.:

According to table 2.10., the number of students from Arab society has more than doubled between the years 2010 and 2020 (25,951 and 53,561 respectively). This is backed up and supported by the information presented in table 2.8. regarding the proportion of citizens aged

25-64 in different countries, with high academic education in 2020, and its maintenance in a high place for several years in a row.

**Table 2.11. The total number of Israeli students in the Israeli Academic institutions and Universities 2010-2021**

| The year | The hole number of Israeli students in the Israeli Academic institutions and Universities |
|---|---|
| 2010 | 283,850 |
| 2015 | 307,300 |
| 2017 | 307,780 |
| 2018 | 305,940 |
| 2019 | 308,340 |
| 2020 | 312,660 |
| 2021 | 320,000 |

Source: Made by the Author from sources [176, 197, 201]

From table 2.11. which presents data regarding the total number of Israeli students in Israeli Academic institutions and Universities from 2010 to 2020, we can notice:

within 6 years, the whole number of Israeli students in the Israeli academic institutions and Universities has increased from 283,850 to 320,000, an increase of about 12.7%, and from the academic year 1969-70 tell the academic year 2019-20, the whole number of Israeli students in the Israeli academic institutions, universities and academic colleges by level of institution and degree, has increased from 35374 to 278504- An increase of about 243130 students- See **Annex No' 26**.

The opening of the academic year 2020-2021 alongside the Corona crisis [178, 200]:

1. Significant increase in the number of applicants for academic studies and full deployment of the higher education system to open the academic year and absorb the high demand. According to data recently collected from institutions of higher education, there is a significant increase of 20% -25% in enrollment in academic studies for all degrees.
2. Continued significant increase in the number of high-tech students including women.
3. Allocation of resources to student's aid programs in the amount of about half a billion NIS per year, including additional assistance for the corona crisis in the amount of 100 million NIS.
4. An additional NIS 70 million for the promotion of digital teaching in favor of the development of technological means and the training of techno-pedagogical teams.
5. Learning combines experience - an investment of about NIS 24 million in employment-oriented academic courses.
6. The launch of the Quantum project in the amount of 1.2 billion NIS in collaboration with the Innovation Authority, the Ministry of Science, and the Ministry of Finance.

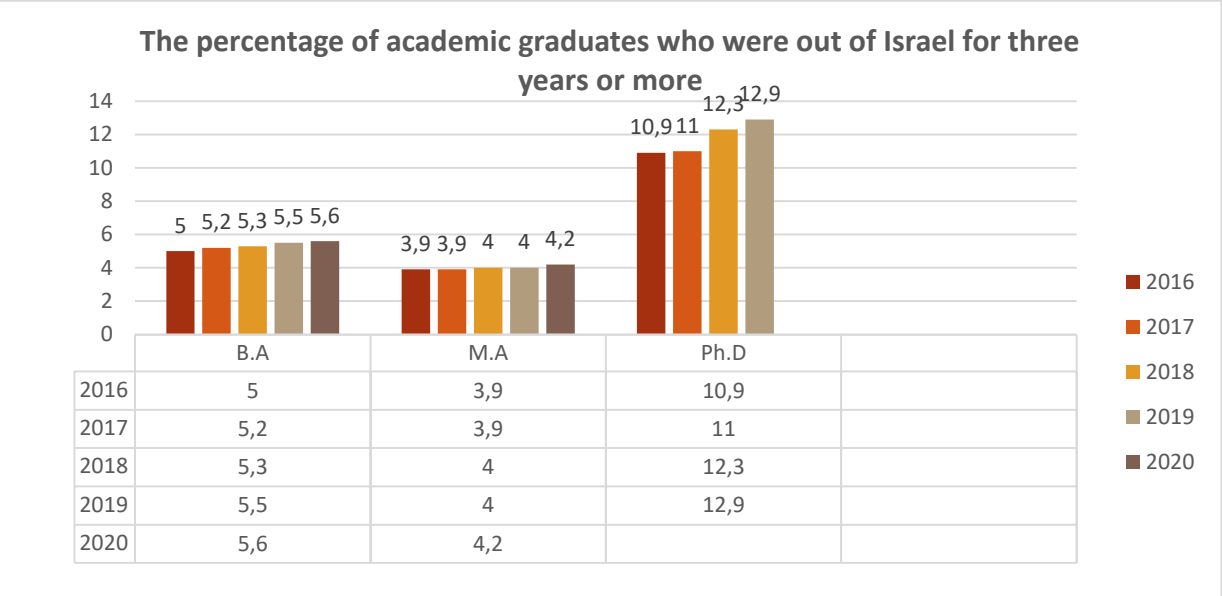
In fact, the higher the education degree, the more Israeli educated citizens leave Israel.

**Table 2.12. The rate of Israeli academics that have been abroad for at least three years in a row: 2017, 2019**

| The rate of Israeli academics staying abroad for at least three years in a row | | | |
|---|---|---|---|
| | B. A | M.A | Ph.D. |
| 2017 | 4.6% | 3.5% | 9.9% |
| 2019 | 5.8% | 4.6% | 11% |

Source: Made by the Author from sources [27, 100, 165, 179, 188]

According to table 2.12. which presents data regarding the rate of Israeli academics that have been abroad for at least three years in a row in the years 2017 and 2019, the rate of Israeli academics that have stayed abroad for at least three years in a row is almost similar between first- and second-degree holders and both are lower than third-degree holders. See also **Annexes No' 28 - 30** in this regard.




| | B.A | M.A | Ph.D | |
|---|---|---|---|---|
| 2016 | 5 | 3,9 | 10,9 | |
| 2017 | 5,2 | 3,9 | 11 | |
| 2018 | 5,3 | 4 | 12,3 | |
| 2019 | 5,5 | 4 | 12,9 | |
| 2020 | 5,6 | 4,2 | | |

**Figure 2.11. The percentage of academic graduates who were out of Israel for three years or more (2016 – 2020)**

Source: Made by the Author from sources [27, 100, 165, 179, 188]

Analyzes of the data presented in figure 2.11.:

1. There is a steady increase in the percentage of graduated of B.A and M.A, while an increased percentage of graduated of Ph.D.

2. The largest percentage is among Ph.D. graduates, which means that high-quality specialists and professionals are looking for better conditions and future abroad, specially graduates in engineering and exact sciences. This can be explained because the numbers of specialists with Ph.D. are more than the PH. D programs. This can explain the high numbers of

"brain drain" of qualified brains such as researchers, doctors, engineers, Industrialists and others [189, p. 34]. Then, in the second place, we can relatively notice a large percentage among Master`s degree graduates in medicine- **Annexes No' 28- 30**.

Actually, prestigious universities and institutions, with world-renowned, such as the “Technion” and “Weizmann institution”, are more badly affected by the brain drain phenomenon [151].

**Table 2.13. The rate of Israeli graduates who received an academic degree in the years 1980-2010 and have lived abroad for at least three years in a row, 2017**

**(The rate of graduates out of all graduates)**

| Humanities and Social Sciences | The rate of graduates out of all graduates | Exact sciences and engineering | The rate of graduates out of all graduates |
|---|---|---|---|
| Graduates of teaching colleges | 1.8% | Graduates of academic colleges | 5.2% |
| Graduates of academic colleges | 4.1% | University graduates | 9.2% |
| University graduates | 6.7% | | |

Source: Made by the Author from sources [7, p. 25, 27, p. 11, 104, p. 35, 166, p. 128, 105, p. 56, 179, p. 31]

Analysis of the presented data in table 2.13.:

Table 2.13. compares between university graduates and colleges graduates in different fields who received an academic degree in the years 1980-2010 and have lived abroad for at least three years in a row.

According to table 2.13., when comparing universities graduates to colleges graduates, the rate of universities graduates is much higher than colleges graduates in all fields, which means that universities graduates immigrate more than college graduates. Actually, Israel ranks first in terms of the number of temporary foreign academic staff in the United States. It's about 19600 faculty members (average for 2015-2017), which includes lecturers, researchers, postdoctoral fellows, and more [27, p. 11, 165, p. 10, p. 25]. - **Annexes No' 28- 30.**

The following tables (tables 2.14. - 2.17.) present quantitative data related to the government expenditure on education, and quantitative data related to the Israeli academic institutions and R&F, including the correlation between coefficients.

**Table 2.14. The total Government expenditure on education, (% of GDP) 1990-2020**

| | Total government expenditure on education, (% of GDP)1990-2021 |
|---|---|
| 1990 | 5.423 |
| **1994** | **6.438** |
| **2000** | **6.118** |
| 2005 | 5.760 |
| 2010 | 5.535 |
| 2013 | 5.885 |
| 2014 | 5.793 |
| 2015 | 5.867 |
| 2018 | 5.857 |
| 2020 | **6.093** |

Source: Made by the Author from sources [168, 201, 22]

Analysis of the presented data in table 2.14.:

According to table 2.14. which presents data regarding the total government expenditure on education, (% of GDP) between the years 1990 and 2021, from the beginning of the current century, the total government expenditure on education as a percent of GDP has declined, and in 2020 the percentage (6.093) has been even less than what it has been in the years 1994 and 2000 respectively (6.438 and 6.118). But still, we recognize a steady and moderate upward trend.

**Table 2.15. The ratio of Government expenditure to GDP in Israel, 2016-2026**

| The year | | The ratio of Government expenditure to GDP in Israel, 2016-2026 |
|---|---|---|
| 2016 | | 37.98 |
| 2017 | | 38.87 |
| 2018 | | 39.72 |
| 2019 | | 39.26 |
| 2020 | | 46.40 |
| **2021** | | **44.26** |
| 2022 | | 39.81 |
| 2023 | | 39.54 |
| 2024 | Projections up/ Estimated | 39.34 |
| 2025 | | 39.23 |
| 2026 | | 39.17 |

Source: Made by the Author from source [168, 201, 226]

Analysis of the presented data in table 2.15.:

The statistic from table 2.15. shows the ratio of government expenditure to gross domestic product (GDP) in Israel from 2016 to 2021, with projections up until 2026. In 2021, the government expenditure in Israel amounted to about **44.26** percent of the country's gross domestic product. It is estimated that the government expenditure as a percentage of the country's gross

domestic product will decline between 2022 and 2026 - a continuing but moderate decline- a decline of about 0.115% in 2026 compared to 2021 [165, 210]- **Annexes No' 31, 36.**

**Table 2.16. Quantitative data related to the Israeli academic institutions and R&F in the years 2005-2020**

| The year | The total number of Academic Institutions and Universities | The number of students in Academic Institutions and Universities (without the free university) | The number of Israeli Outbound students | Gross domestic expenditure on research & academic development (Millions of $) |
|---|---|---|---|---|
| 2005 | 54 | 189,000 | 16,150 | 22 M/$ |
| 2010 | 62 | 220,000 | 8,200 | 32 M/$ |
| 2011 | 62 | 225,000 | 4,900 | 33.5 M/$ |
| 2012 | 65 | 238,000 | 5,300 | 34 M/$ |
| 2013 | 68 | 244,000 | 6800 | 38 M/$ |
| 2014 | 67 | 254,000 | 7200 | 42 M/$ |
| 2015 | 67 | 258,000 | 8,000 | 44 M/$ |
| 2016 | 66 | 260,000 | 7,000 | 47 M/$ |
| 2017 | 62 | 260,500 | 7,100 | 49.5 M/$ |
| 2018 | 62 | 262,000 | 7,000 | 51 M/$ |
| 2019 | 63 | 256,000 | 7,200 | 51.5 M/$ |
| 2020 | 63 | 320,000 (including free University) | 6,900 | 50 M/$ |

Source: Made by the Author from sources [148, p. 23, 149, p. 19, 177, 183, p. 23, 197, 201, 207]

1- The data indicates that, although there is an increase in the total investment in education, as well as a continued increase in the number of academic institutions, still there is a structural breakdown in 2020.

2- Since 2005:

There has been an increase in the total number of Academic Institutions and Universities, although between 2014-1018 there was somehow a little decrease.

There has been an increase in the number of students in Academic Institutions and Universities.

There has been an increase in the gross domestic expenditure on research & academic development (without 2020).

3- Since 2005, there has been an increase in the number of Israeli outbound students (without 2020).

**Table 2.17. The correlation between coefficients- Person correlation**

| The correlation between relevant **coefficients- Pearson correlation** (p - value<0.0001) | |
|---|---|
| | **The Pearson correlation between coefficients** |
| the total number of Israeli outbound students to the total Israeli students | -0.832 |
| the total number of Israeli outbound students to the number of Academic institutions | -0.862 |
| the total number of Israeli outbound students to the GDP | -0.782 |
| the R&D outputs in Israel and the Israel`s academic ranking in an international level. | -0.727 |
| the total number of Israeli students and the Israeli GDP. | +0.983 |
| the total number of Israeli students and the number of Israeli Academic institutions. | +0.967 |

Source: Made by the Author

Analysis of table 2.17. which presents the correlation between coefficients- the Pearson correlation- according to table 2.17.:

1. There is a highly negative and very significant correlation of **-0.832** between the total number of Israeli students and the number of Israeli outbound students.
2. There is a highly negative and very significant correlation of **-0.862** between the number of institutions and the number of Israeli outbound students.

This led to the conclusion: the bigger is the institution's number, the smaller is the number of Israeli outbound students (negative correlation).

3. There is a highly negative and very significant correlation of **-0.782** between the gross domestic expenditure and the number of Israeli outbound students.
4. There is a direct and negative correlation of **-0.727** between the R&D outputs in Israel as it is reflected in scientific publications over time and Israel`s academic ranking in an international comparison and levels.
5. There is a highly positive and very significant correlation of **+0.983** between the total number of Israeli students and the Israeli GDP.
6. There is a highly positive and very significant correlation of **+0.967** between the total number of Israeli students and the number of Israeli Academic institutions.

7. The other factors and coefficients are not significant (correlations of less than 0.5).

**Synthesis of the data from the regression model:**

The explanatory variables chosen were the main and relevant reasons that led to the Israeli mobility of higher education students and brain drain.

The proportion of explained probability was high (0.809). The research hypothesis was confirmed, there were significant and explanatory variables such as low salaries, high costs of living, high levels of taxes, high levels of unemployment, and many obstacles in the academic system mainly the number of academic institutions, the national academic supply, and the difficult admission requirements. On the other hand, there were less significant variables such as a better standard of living in other countries, the commercialization of senior faculty standards, and the lack of infrastructure and advanced research.

Hence, the author recommends:

1. Economically and occupationally- ensuring high salaries, low costs of living and taxes, qualified and high levels of employment.

2. Academically- increase the number of academic institutions and variety of faculties and academic supply, updated and competitive academic reform, which encourages competitiveness with national and international academic systems, which includes Innovative teaching methods, and operating international relations and attractive.

After distinguishing the advantages, disadvantages, contribution and cooperation between countries around the world in the context of brain drain and academic mobility, it`s essential to set up an overall comprehensive formula that addresses and considers the interests of the individual student or specialist that is looking for better standers of life in all aspects mainly academically and occupationally. In addition to this, the state is supposed to take intensive and comprehensive responsibility in everything related to the education of its citizens, to ensure economic and employment infrastructure, to ensure political and security stability, and to enable and support moves that will lead to stability and social-social security.

This will be possible, only after a comprehensive consideration and treatment of all the elements related, affecting and affected by the brain drain phenomenon, and the implementation of treatment plans that aim to treat all the negative factors of the phenomenon, either directly or indirectly, which will reduce the dimensions of the phenomenon that is of concern to governments and related fields in global vision including the state of Israel.

It is important to emphasize that the scientific-technological revolution brought about massive changes and current characteristics including international education migration flows which is manifested in student migration, and as a result, also the integration of the employment

system since it allows and offers students from different countries to integrate into the employment market and work in the host countries while studying, which stimulates them not to return to their homelands, especially if the employment conditions are good and comfortable.

In fact, the globalization of the labor market in terms of supply and demand of skilled, expert and qualified, means that developed countries actively use foreign resources of professionals including foreign students, who make up a relatively large part of the students studying in the universities of a large part of the industrialized countries, to the extent that trans-corporations Nationals focus more and more on highly skilled personnel from different countries in order to increase production and improve product quality. This certainly encourages the migration of leading intellectuals and "brains" to foreign countries.

We can summarize the main relevant reasons and factors causing the brain drain and academic mobility from Israel according to the following table (table 2.18.):

**Table 2.18. The main and relevant reasons that led the Israeli "minds" to emigrate from Israel**

| The reason<br>And The relevance of the reason in scale 0-10<br>**0- The index is not relevant at all, 10- The index is highly relevant** | |
|---|---|
| Elements related to the **Education system**- 7.2 | Looking for better professional opportunities and career in other countries - 8.2 |
| The unstable security situation and political instability- 9.1 | |
| Searching **good and better studies** outside of Israeli- 8.8 | Receiving good and high salaries and financial opportunities - 9.2 |
| The lack of infrastructure and advanced research and commercialization of senior faculty standards - 7.2 | Relatively high level of taxes - 9.2<br>Relatively high costs of living- 8.9 |
| Difficult admission requirements in the Israeli universities, besides many other obstacles in the Israeli Education system- 9 | Better standard and quality of living in other countries- 8.4 |
| High level of unemployment sorted by fields and by specialties- 8.1 | Personal preferences and choices - 8.8 |

Source: Made by the Author from source [26, 27, 28, 102, 155, 165, 205, 211]

Analysis of the presented data in table 2.18.:

According to table 2.18. which presents data regarding the main and relevant reasons that led the Israeli "minds" to emigrate from Israel, the main reasons that led to the emigration from Israel of scientists, specialists, and highly qualified personnel are **intersected and mixed**, and they are:

- From a security perspective, the unstable security situation and political instability,
- Academically and educationally, various and numerous obstacles and failures in the education system, alongside strict admission conditions for leading and sought-after professions and faculties in Israeli universities, cause Israeli students to seek admission conditions and academic study conditions even if the level of education is relatively poor, in universities abroad.
- Economically and occupationally, a high level of unemployment, low salary levels, high levels of taxes, and high costs of living in Israel compared to parallel countries around the world.

These elements cause many Israelis, especially specialists and academics to look for better careers and better professional opportunities in other countries, along with personal choices and preferences such as a better standard of living in other countries, or to live in core cities and countries around the world.

In fact, from analyzing the data in the proposed work, solving the problem will be possible, only if there is stable and constant security for the Israelis, alongside salary satisfaction by fields and specialties [27, p. 9, 165, p. 13, p. 24, 211]- see **Annexes No' 29, 36, 43.**

**The Salary Satisfaction and its Influences on the Israeli Brain Drain-**

Actually, the relatively low salaries in Israel are considered the main reason for the brain drain from Israel, and only recently have salaries been raised in some professions and specializations in Israel, such as computer science and economic knowledge jobs. But still, if we compare the average salaries of Israeli academics to other countries, without any doubt, the average salaries in Israel are still relatively neither high nor satisfactory, and even relatively low compared to a large part of the OECD countries. In fact, comparing salaries, which is at the top of the scale of reasons for brain drain, can explain the trend of brain drain to other countries, and only if we reach somehow salary satisfaction, we will be able to see, even initially, a ray of light and hope at the end of the tunnel and think about the return of the brains that have already left [165, p. 22-23] [179, p. 26] [242, p. 52].

Figure 2.12., presents the average salary after 5 years of experience of professionals in some fields such as engineering, law, medicine, and mathematics in several developed countries such as the USA, Canada, France, England and Germany, including in Israel for a month in USD between the years 2014 and 2020**.**

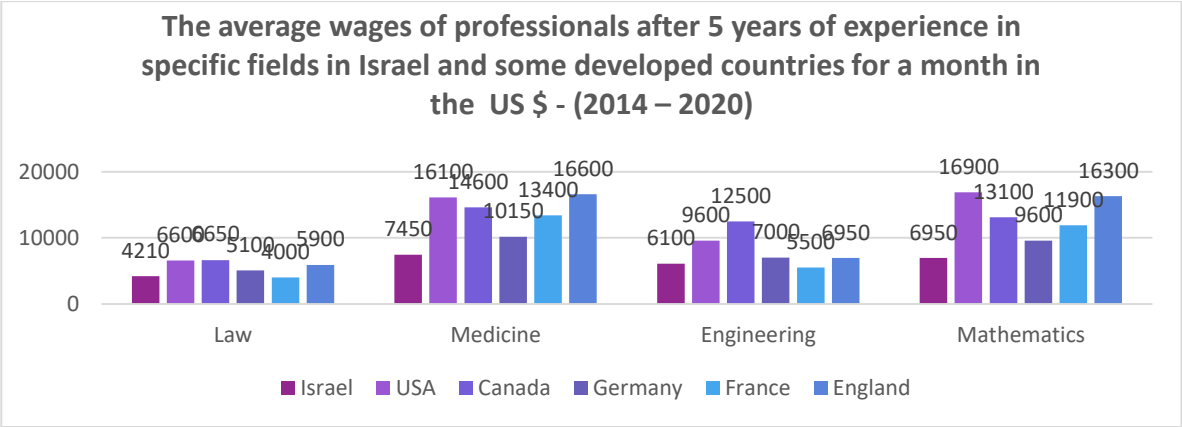



**Figure 2.12. The average monthly wages of professionals after 5 years of experience in specific fields in Israel and some developed countries in the US $ - (2014 – 2020)**

Source: Made by the Author from sources [27, 179, 201, 203, 206, 211]

From figure 2.12. which presents data regarding the average monthly salary of professionals in several leading and sought-after fields such as medicine, law, engineering, and mathematics after 5 years of experience in several developed countries, including Israel, between the years 2014 and 2020, compared to developed countries, the average salary of Israeli professionals is much lower than the salary of workers counterparts with the same professionalism. Developed countries attract the most skilled Israeli workers which causes them to immigrate, and these countries attract them through the high salaries they can earn there, which is the so-called academic brain drain, especially in the field of medicine, and then mathematics. Actually, the most attractive destination for Israeli professionals are USA, Germany, and Canada respectively [27, 165, p. 22-23, 211] - **Annexes No' 31, 33, 36**.

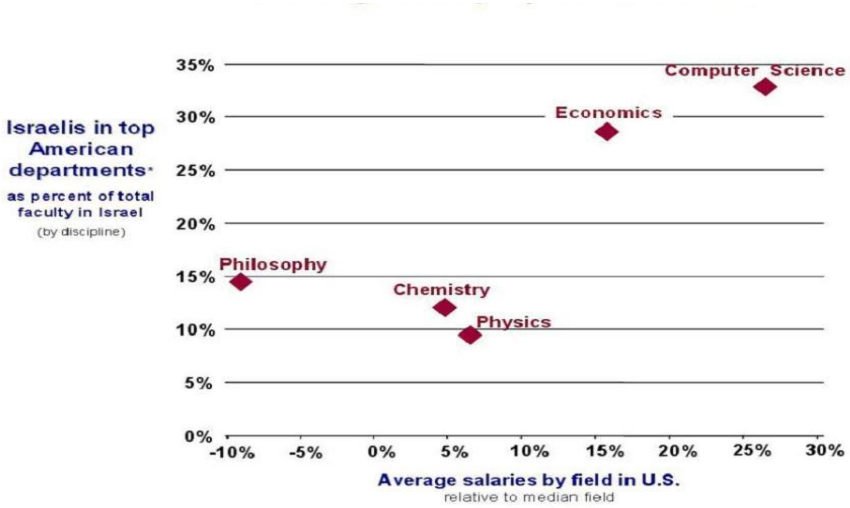



**Figure 2.13. Salary differences between fields and emigration by top Israeli academics**

Source: [25, 167]

The Israeli immigration rates to the leading American educational and academic institutions differ according to the fields, where the fields with the highest immigration rates were the fields that pay relatively very high salaries. In terms and statistical measures, the salaries in the fields of chemistry, physics, and philosophy are in the range of almost 10% of the American academic median. Also, the average salary in the economy is almost 15% higher, while the salary differences in the field are significantly higher (almost 46%) than the median standard deviation. This means that leading economists who are supposedly at the top end of the field's salary scale, earn a little more than the 15% difference between the academic and economics median.

Actually, while academic salaries in the US have risen over the past decade, Israeli academic salaries decreased, and the pay gap between American and Israeli academics has even increased. Also, the salary in Israel in specific competitive sectors and specializations rose significantly, which increased the relative erosion of academic income.

This is very noticeable in computer science, since in this field the average salaries are almost 26% higher than the academic median, while the income gap exceeds the academic median standard deviation by almost 60%, therefore, it is likely that a large number of Israeli scientists who have good positions in the best departments in American computer science field, get the highest salaries.

This indicates that when wage gaps increase significantly, immigration rates also increase accordingly as well, alongside other main reasons such as insufficient positions, insufficient and unsatisfactory funding for the research laboratories and an archaic institutional organization [25, 167].

Actually, Israelis, particularly between the ages of 25-40, who hold high degrees, immigrate outside the country's borders to look for jobs with higher wages, mainly to the United States and Europe, because there their opportunities are better in terms of the quality of the jobs, the invitations to develop professionally and certainly to obtain a correspondingly higher salary.

Israel, along with Italy and Greece in a global view, has lagged behind global trends of increasing incentives for professionals and especially young people to stay in their home countries. Israelis specifically, are less inclined to return to their homeland after completing their academic studies abroad.

In fact, The Israeli system does not reflect in a true and comprehensive way the reality of "wage gaps" according to specializations. There are almost no differences or at least no significant differences between experts working in the most sought after fields such as computer science and economics and those employed in less sought after fields such as literature. On the other hand, in many countries, the market determines the salary level of experts, what requires and even forces

somehow the State of Israel to further protect of its experts and academics by providing incentives that aims to bring the experts and encourages them to stay in their homeland.

These attractive conditions and especially the salaries satisfactory that other countries allow for researchers, experts and skilled workers have a negative and direct impacts on several contexts and fields in Israel, mainly: the quality of the Israeli academic institutions, the research field and as a whole in specific fields and specializations, which makes it difficult for the State of Israel to deal with the problem of brain drain, especially to the United States in the last decade. In fact, this phenomenon presents a bleak and negative image of the Israeli academy [27, p. 14, 126, p. 12, 157, p. 32] **Annexes No' 27, 33.**

**Brain Drains in Different Fields-**

**Brain Drains of Physicians-**

The latest information by the Israeli Ministry of Health and related researches indicated that about 4050 medical doctors immigrated in 2018, which represents approximately 11.9% of all medical license holders in Israel in this year [176]. Actually, related researches indicate that migration of Israeli doctors is a significant phenomenon mainly doctors who had immigrated to Israel, doctors who had studied abroad, and especially the generation of the seventies and eighties- the number of doctors living abroad is growing as they received their licenses earlier [17]. Doctors in all fields are defined as living abroad for three years or more, and most of them have a field of specialization [27, p. 13, 146, p. 1055, 147, p. 20, 152, p. 12]- **Annexes No' 37, 38.**

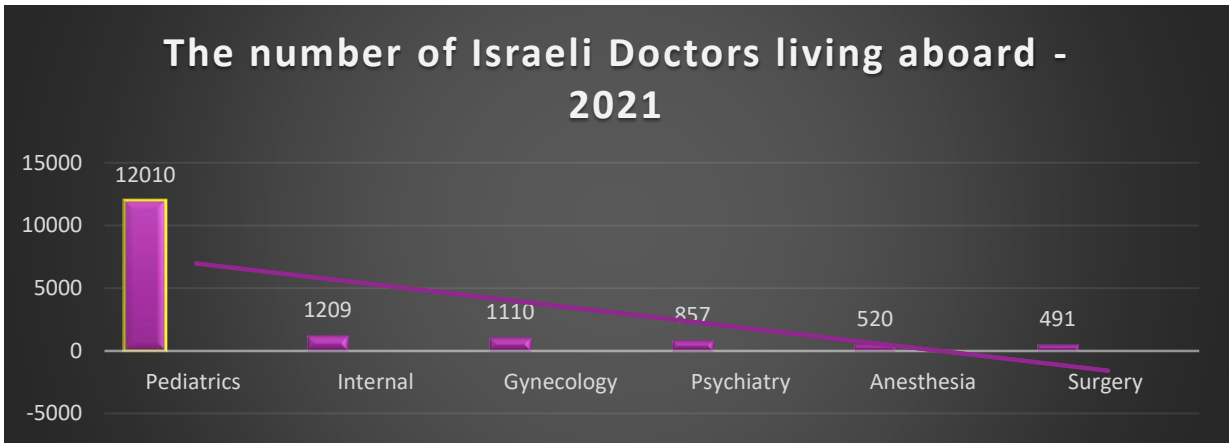



**Figure 2.14. The numbers of Israeli Physicians living abroad, by specialization -2021**

Source: Made by the Author from sources: [27, p. 13, 132, p. 499, 146, p. 1058, 152, p. 12, 176]

According to figure 2.14. which presents data regarding the numbers of Israeli Physicians living abroad, by specialization in 2021, among doctors the highest percentages are pediatrics- about 12,010 Israeli doctors in 2021 were abroad for three years or more, then Internals,

Gynecologists, Psychiatrists, Anesthetists, and surgeons respectively. Most researchers in these fields are older people - in their sixties and more, and their specialization is not popular in Israel, because they mainly can be treated within the framework of hospitals, so these experts/researchers have a greater desire to leave Israel and have a decent living by working in hospitals there. This enables and opens other developments and improvements in their fields, as well as self-development [27, p. 2**,** 146, p. 12]- **Annexes No' 39, 40.**

**Math and Science Brain Drain-**

There has been much wringing of hands and speech-making about perceived declines in the number and quality of Israelis prepared to work and do research in the fields of science, technology, engineering, and mathematics, and the implications of that trend for the country's standing in the world economy. A government report released aims to lay out exactly what programs are in place to educate and produce technologically skilled graduates and what might be done to prime the pump [26, p. 193, 152, p. 12-13]- **Annex No' 38.**

The government spends millions of shekels in different programs designed, at least in part, to improve the Science educational field, and to increase the number of students enrolled in science, technology, and math fields, even in underrepresented minority groups. In this regard, the major problem is, that most of the students enrolled in scientific fields occurred among bachelor's and master's degree students, while the number of students enrolled in doctoral programs in those fields actually declined [27, p. 2, 74, p. 331, 75, p. 487, 209]- **Annex No' 36.**

Based on interviews with officials at numerous universities and colleges, as well as some representative students, several suggestions should be taken into account for encouraging more students to enroll in the science fields and to ensure that they will come out better prepared and continue to Ph.D. studies. These suggestions included [10, p. 42]:

1- Mandating more and better mathematics and science courses in high school.

2- Improving the quality of teacher education and preparation in scientific disciplines.

3- government intervention in creating a national agenda for science and technology education and providing more funds for academic research.

**Brain Drains in the High-Tech and Computer Engineering-**

In the last decade, the Israeli left some 10,000 scientists. According to a report by "Taub Center for Social Policy Studies", the percentage of Israeli brain drain to the United States is much higher than the Western countries. Although, the rate of brain drain was arrestee somewhat in recent years because of the economic crisis, despite this Israel must think seriously about how to

prevent the escape of thousands of minds in the coming years by understanding the issue in-depth and design treatment plans, and monitor their implementation [217]. The related bodies in Israel should Provide resources and investment funds that will return to its coffers through companies which scientists will establish, and through trials that should take place. This is the main step for a better future and bringing back the Israeli minds. Otherwise, the Israel brain drain crisis will increase, especially because of the world's globalization [61, p. 33, 177, 205].

Actually, the situation on the ground shows that the movement of the minds is still increasing due to the lack of faith in the government's ability to improve their situation in the near future, and so, if no significant and comprehensive solution is found for high-tech workers, the loss of human capital in Israel will increase, and there will be a significant economic crisis [27, p. 2]- **Annex No' 40.**

There are a direct connection and positive correlation between the brain drain and the reduction in budgets in higher education and R&D. which means, hundreds of scientists won`t work in Israel [179, p. 11].

**Table 2.19. The numbers of Israeli high-tech experts and computer engineers in some leading and developed countries – 2021**

| The country | **The numbers of Israeli high-tech experts and computer engineers** |
|---|---|
| England | 2120 |
| Canada | **3295** |
| Australia | 1014 |
| France | *806* |
| Germany | 948 |
| England | *733* |
| New York | **5433** |
| Los Angeles | 1504 |
| Boston | 2213 |
| San Francisco | **3538** |

Source: Made by the Author from sources [27, 133, 179, 180, 181]

According to table 3.19. which presents data regarding the numbers of Israeli high-tech experts and computer engineers in some leading and developed countries – 2021, the highest were in New York (about 5433 experts), and then in San Francisco (about 3538 **experts),** and Canada (about 3295 **experts)**. The lowest numbers were in England (it's about 733 experts) and France (about 806 experts).

**The Brain Drains of Law Studies -**

There is a huge supply of lawyers against the employment capacity of the local market. There are about 53900 lawyers in Israel in various specialists: divorce, torts, criminal, medical

malpractice intellectual property or labor law. About 45% of them are women, and almost 60% of them are less than forty. About six- thousands of them are those who chose to suspend their licenses. Actually, most Law offices employ 2-10 lawyers, and there is about one lawyer per 165 residents in Israel which marks a world record [156, p. 153].

With comparison to leading countries around the world, In the United States, for example, there is one lawyer for 277 residents [206]. Moreover, UK lawyer to about 412 civilians. Germany - one lawyer to -614 people. In France, the ratio is one to 1,210 attorney residents. Japan's ratio is one lawyer to 4,800 residents, and China - Lawyer of 8,000 residents [198, 203, 216**]**.

Lawyers in Israel charge fees according to supply and demand in the market, competition in the industry and branding offices. A lawyer's salary ranges from 1800$ to 18,000 5200$ per a month [192].

Actually, the author Deduce that, although in recent years ***the Israeli government*** has stated its intention to bring back Israeli experts and fight the phenomenon of brain drain, but the results have not been impressive and no real or impressive progress has been achieved since the "Israeli brains" have remained abroad, and even more Israelis are looking for studies and careers abroad [27, 28, 102, p. 942, 165, p. 17]:

- the main ones are the commercialization of standards for the senior faculty, in addition to the lack of infrastructures that allow advanced research, which led to significant wage differentials. Most scholars to move abroad for post-doctoral training period but remain abroad because of these reasons,
- Many obstacles in the academic and educational system, along with difficult admission conditions at the academy,
- Poor quality of education in schools,
- Better professional opportunities in other countries,
- Relatively poor quality of life in Israel compared to many countries around the world,
- The economic crisis and terrible cost of living, especially in light of the corona crisis, which is reflected by the high costs of apartments alongside the high expenses on essential commodities such as food, electricity, fuel and many others,
- Low salaries,
- High costs of living,
- High level of taxes,
- High level of unemployment by fields and specializations,
- Personal choices, such as to live in the core cities, in the center of the world, or other

personal preference,

- Security instability in the State of Israel,
- Political instability,
- Lack of economic opportunity, which causes the skilled and talented workers to leave Israel and look for better opportunities elsewhere,

Skilled and talented Israeli workers sometimes leave because of the instability, lack of opportunities, due to feelings and thoughts that they can realize their goals and especially in the employment context more easily in other countries even distantly, and also due to the fear that Israeli companies and industries are not able to keep up with social and technological changes [26, p. 210, 27, p. 9, 28, p. 239, 102, p. 943, 155, p. 142, 165, p. 13].

As a result of the phenomenon of brain drain from Israel, many fields, especially the leading and prestigious fields, are losing skilled professionals, experts, researchers and academics, such as doctors, scientists, researchers, engineers, and others, which will cause double damage, both due to immigration and the loss of "brains" and expertise, which reduces the supply in those professional fields, and from an economic point of view since the country's economy is damaged due to this immigration [70, p. 5, 176].

In fact, the moves and steps that the Israeli government planned were not successful since the related institutions and bodies did not cope in an optimal and satisfactory manner. The responsible bodies and ministries for handling and dealing with the phenomenon in the State of Israel were supposed to take care of and handle in an optimal and holistic way the education system, the economic system and encourage economic growth, bring about social security and ensure its political stability, in order to reduce the dimensions and negative aspects of the phenomenon. The treatment was very partial, and students looked for alternative options for studies and a better life abroad [163, p. 66, 165, p. 9]. Therefore, the author thinks that intensive and comprehensive steps should be planned, adopted and taken for dealing with the main factors that lead to brain drain and all the direct and indirect elements related to this phenomenon, otherwise the damage will get worse especially in the economic, academic and occupational fields.

But still, some of the institutions and bodies involved in the issue managed to introduce positive practical changes to a certain extent, and the demand for mobility has partially stabilized according to data on the number of applicants for academic study visas abroad. But still, much more needs to be done in this regard [75, p. 488]. The relative level of demand was stable over several years, ranging from almost 5.4% to 4.8%, except in 2001 when the level of demand reached about 9.1% (probably due to the increased demand for studies in the country of Latvia) [144, p. 6].

Actually, the Israeli brain drain has economic and social implications such as [70, 155]:

• At the macroeconomic level -The Damage to national purchasing power - The brain drain may affect the combined purchasing power of the Israeli consumer. No doubt, there is a direct correlation between the level of wages and education. As mentioned before, one of the main reasons for educated people's immigration is improving salaries and welfare. Actually, these sectors-the upper parts of the salary tables spend more on goods and services than the average consumer [70, p. 8].

• The injury in the GDP/GNI - The Israeli brain drain leads to a drop-in income of those employed. The decrease in income taxes will affect output and growth. So, a decline in GDP and economic growth forecasts will lead to negative influences on the state's finances [70, p. 11].

• Injury on the demographic balance - The immigration of a very important part of the employment population outside of Israel's borders exacerbates the problem of burden-sharing in Israeli society and increases the burden on the working population and productivity. Therefore, it can be assumed that the increased brain drain, causes problematic demographic balance [107, p. 41].

• The Financial capability of the employed - it is important to affect and change the individual`s decision related to the emigration so they choose to enhance the well-being given the endogenous and exogenous conditions [155, p.143].

• The Injury per employee quality - basically setting the 'brain drain problem", rather than emigration. It can be assumed that brain drains entail damage to the top layer of human resources. Once derecognized quality labor inputs are caused by a direct hit on the level of growth and development. The working assumption is quality personnel, reasonable, and a greater capacity for portability to other markets [155, p.141].

In light of the facts presented and analyzed in the previous sub-sections, the author considers it appropriate and appropriate to utilize the mutual contribution and cooperation between the countries in the economic context, as well as with regard to educational and social needs at the local and global levels. At the local level, the needs and interests of Israeli students and professionals whose circumstances forced them to leave their homeland should be taken into account. Therefore, in the third chapter of the research work, the author deemed it appropriate to propose an original innovative academic-economic model. A model that offers comprehensive solutions and operational steps to be taken by the relevant ministries to provide a local response to Israeli "brains" in the hope of encouraging them to study and work in Israel, to bring back the "brains" who have left the country and provide them with attractive studies and jobs, and, importantly, to attract foreign students to study and work in Israel.

### 2.3. The impact of high-skilled migration (brain drain) on the Republic of Moldova, an analysis of possible consequences and approaches to manage this phenomenon

Highly skilled immigration is a very important term that is essential to discuss and research, especially in the context of the Republic of Moldova like many other parallel countries with the same conditions and elements, since it is a relatively small and developing country that needs a skilled workforce that is very essential especially for its future economic, occupational and academic development [243, p. 115]. High-skilled migration raises an important question - should this type of migration be regulated, controlled, and restricted?

In the last three decades, young Moldovans have managed to cope with a grim economic situation, with limited job opportunities and low wages [244, p. 54]. But the situation is getting worse for many local and global reasons such as global and regional crises like the COVID-19 pandemic, the Russian invasion of Ukraine and the unprecedented inflation. Therefore, the need for a strong and skilled workforce is increasing, but due to the worsening of conditions, many young Moldovans have found it appropriate to leave Moldova and look for opportunities elsewhere, which has left Moldova with a shortage of talent and necessary skills, which poses a risk to the competitiveness and growth of local industries. Indeed, the country has lost almost 50% of its young student population over the past 16 years [245, p. 58] [247, p. 88].

In fact, to address the problem, ensure a better future for Moldovan youth and ensure a trained talent pool that will lead the Moldovan industry and economy, massive and comprehensive measures are required. Operative measures are required such as the expansion of innovation centers to improve student skills, support for business development and fostering community involvement through innovation and cooperation between donors from the private, public and academic sectors will turn the brain drain into ***brain gain*** in the long term, even if only partially [39] [246, p.75].

This process must be differentiated from "brain/intelligence sharing" which involves a two-way flow of skilled people between the receiving states and the sending states. The exodus of intellect is also distinguished from the" **brain/intelligence circulation**" which refers to the cycle of moving abroad for studies or acquiring skills and an eventual return to the field of work of the migrant's country of origin. Experts in the field often ask themselves the following question: Does the exodus of intellect contribute to the depletion of local human capital? **The answer is not so obvious** if the prospects of migration induce the formation of new human capital. The exodus of intellect influences the economic development of the world, having **both negative and positive effects** on society.

Among the negative effects, is the reduction of the skilled human potential of the emigrants' home states, the increase of the tax burden on the remaining ones, and the reduction of labor productivity, competitiveness, and innovative/creative potential of the developing states. Particularly high rates of intellect drain negatively influence GDP growth and reduce its growth rates. The exodus of intellect in itself is already a significant loss of valuable human capital, therefore one of the negative effects is the reduction of the human potential of states. The lack of automatically qualified human capital reduces the number of investments in key areas of the economy such as innovation and where the most highly qualified personnel are needed [248, p.110].

Contemporary literature demonstrates the existence of positive effects generated by the exodus of intellect. The most positive contribution remains to be made by the migrants ' remittances, which through the foreign currency sent home contribute to the increase of the population's well-being, but also to the increase of the state's revenues, being an easy source of income, without any effort from the state.

Other positive effects can be considered the formation of valuable relations with foreign states. Once migrants settle in other states, they develop marital, economic, political, social, and cultural relations with the host country. These relationships may eventually be important to the migrant's home state. Migration flows also facilitate future migration. Human capital flows contribute to liberalizing migration, creating greater freedom, improving migration legislation, etc. It is particularly important to note that the main beneficiaries remain the countries that receive these large flows of skilled capital and reap the full benefits of its activity [249, p. 45]. These states are exempt from additional expenditures on primary, secondary, and higher education. They only get qualified staff, ready to be employed and contribute to the economic growth of the states. In the context of the brain drain, it is always the 'two camps', which are, on the one hand, the developing countries that supply the labor force to the second camp of developed countries that receive the influx of specialists. Economic and political stability, new development and research opportunities, better living conditions, and higher salaries are just some of the main reasons why emigrants leave their homeland in search of the enchanted land where their dream of self-fulfillment will become reality.

The findings of quite a few national studies point to both the positive impact of the migration of highly qualified specialists and the waste of the brains of Moldova's highly qualified labor force. ***The author agrees with the existence of the brain waste problem but considers it very controversial to argue that the migration of highly qualified specialists will have a positive impact on Moldova.***

Since there is no exact data on the number of Moldovan citizens living abroad, and even more so - what is the number of highly qualified specialists or university graduate students who fall into the category of "flight of minds", the author collected information from various sources. Based on these data, it is possible to estimate approximately the problem that clearly exists in Moldova.

Unfortunately, the author summarizes with respect to legal norms and other official studies, that in Moldova: there are no official instruments for registering and monitoring highly skilled migration; there are no normative acts aimed directly at the management of highly-skilled migration; and the existing tools have a fragmented and inefficient approach.

Therefore, we will present a perspective on the negative impact of highly skilled migration and *how it should be regulated**, using the recommendations proposed by the author to solve the same problem in Israel.***

Over time, the sectoral structure of the world economy has undergone changes, with a substantial loss of manufacturing jobs to the service sector. Thus, we can explain the growing demand for qualified personnel necessary for the economic activity carried out specifically in the service sector. Also, with the globalization and internationalization of the production process, which has led to the opening of factories, subsidiaries, and subsidiaries in different parts of the world, human capital can be freed from the physical presence of its owner. A good example may be that many inventions, technologies, and the fruits of their use can move from one country to another without the presence of the inventor, and the sphere of services offering a range of operations carried out online obliterates any need for physical contact between the consumer and the service provider. While abroad, highly skilled migrants establish important economic, social, and cultural links that facilitate the exchange of goods and human capital. This migration process creates connections that benefit future emigration, but also stimulate consumption. This can be both internal and external consumption. When emigrants return to their home country, with much greater financial means than the native population, they tend to consume various goods. Usually, the skills they have acquired abroad form certain preferences which, within the confines of the home country, will be reflected in the consumption of imported goods. This can be explained very simply: important goods have a high level of standardization, which ensures maximum consumer satisfaction and high quality. Knowing a better standard of living, the emigrant, even when he returns to his home country, will be inclined to consume better goods, probably imported goods.

From another point of view, the exodus of intellect can lead to the favoring of export, when emigrants will consume the goods produced in the Republic of Moldova even abroad, or

when they will establish economic activities based on export.

Human capital suffers greatly from the brain drain phenomenon. Economic experts believe that human capital is one of a nation's basic assets because it is the engine of progress, innovation, and development as a whole. Without the existence of highly skilled human capital, it is not possible to develop technologies in the international arena, nor even the take-up of new technologies and their application in their countries of origin.

All these economic changes that are taking place today put the emphasis on innovative ideas, and on optimal and effective solutions to the everyday problems facing the economic system. If in the past, cheap and unskilled labor was of great interest to investors, nowadays it is known that a lot of investors who would like to do business in the Republic of Moldova say that the country does not have enough highly qualified personnel and often investors have to import even personnel to the Republic of Moldova. This is a sad situation for the national economy because even when there are real opportunities for the country's population to earn a high wage for skilled work, the Republic of Moldova cannot benefit from them.

Remittances are always at the center of "brain drain" discussions. These are one of the most obvious positive effects in developing countries. The Republic Of Moldova is no exception and the contribution of remittances to GDP is colossal.

There are international data showing that the number of highly qualified workers in the total share of migrants is usually very high. Thus, Peter Stalker gives the following examples: In Africa in 2000, only 4% of the population had higher education, while 31% of African migrants showed that they had higher education. For Asia, the corresponding figures are 6 and 44%, and for Latin America and the West Indies, 12 and 28% [150, p. 139].

According to the IASCI study, published in 2015, Moldova has a similar proportion of highly qualified workers: 28% of all migrants have received higher education; 45% have completed secondary school or vocational education [55, p. 39]. Actually, the official data of the Bureau of Statistics of Moldova, show for 2017 a number of 318,400 Moldovan migrants working or looking for work abroad – **see table 2.20** and **Annex No' 22.**

**Table 2.20. The population aged 15 years and over, working and looking for work abroad by Age groups, Sex, Years, Quarters, and Areas (hundreds)**

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| | Annual average | Annual average | Annual average | Annual average | Annual average | Annual average | Annual average |
| | Whole country | Whole country | Whole country | Whole country | Whole country | Whole country | Whole country |
| Age | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| groups – total | | | | | | | |
| Both sexes | 316,900 | 328,300 | 332,500 | 341,900 | 325,400 | 319,000 | 318,400 |

Source: [175]

An analysis of table 2.20. which include data regarding the population aged 15 years and over, working and looking for work abroad by age groups, sex, years, quarters, and areas shows that, in both sexes, in an annual average, and in the whole country, there is a steady and continuous increase in their numbers between the years 2011 and 2014 (about 316,900 in 2011, and about 341,900 in 2014 - an increase of about 7.89%), while in the years 2015-2017, a moderate and steady decrease was diagnosed regarding their numbers (about 325,400 in 2015, and about 318,400 in 2017- a decrease of about 2.15%) .

**Table 2.21. The population aged 15 and over, working or looking for work abroad by Country of destination, level of education, Age groups, years, Statistical regions, and sex, (2010- 2017)**

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|
| | Whole the country | Whole the country | Whole the country | Whole the country | Whole the country | Whole the country | Whole the country | Whole the country |
| | Both sexes | Both sexes | Both sexes | Both sexes | Both sexes | Both sexes | Both sexes | Both sexes |
| All countries | | | | | | | | |
| Higher | | | | | | | | |
| Age groups – total | 33,300 | 33,600 | 34,800 | 36,100 | 37,700 | 42,900 | 42,400 | 46,600 |

Source: [175]

An analysis of table 2.21. which include data regarding the population aged 15 and over, working or looking for work abroad by country of destination, level of education, age groups, years, statistical regions, and sex shows that, in both sexes, and in the whole country, there is a steady and continuous increase in their numbers between the years 2010 and 2017 (about 33,300 in 2010, and about 46,600 in 2017 - an increase of about 39.94%), while in 2016, there was extremely minimal decrease.

The data provided by the National Bureau of Statistics in Moldova on the number of migrants or people looking for work abroad with higher education as presented in table 3.21. show that in 2017 their number amounted to 46,600 people, which is approximately 15% of the total number of migrant workers- see **Annex No' 22**.

The Ministry of Health of Moldova does not provide official data on the number of medical

personnel traveling to work abroad. Nevertheless, medical workers wishing to go to work abroad apply for confirmation of their higher and secondary medical education, which is necessary for the recognition of a diploma abroad. During 5 years (2007-2012), 2,869 medical workers - 1,269 doctors (44.2%) and 1,600 medical workers with secondary education (55.8%) applied to the Ministry of Health for confirmation of higher and secondary education. [212, p.11]. The outflow of medical workers is becoming a growing problem for Moldova because the recognition of Moldovan medical diplomas is simplified in Romania, the main destination country for medical workers migrating from Moldova. A trend that will lead Moldova to a tangible loss of its medical workers in the near future is similar to other small and developing countries. In Manchester, UK, for example, there are more doctors from Malawi than in Malawi itself. Of the 600 doctors trained in Zambia, only 50 works in their own country. [150, p.145].

As in the case of medical workers, there are no reliable data on the migration of education professionals. But we can conclude from past studies [39] - most educators who have emigrated from Moldova work in jobs with lower qualifications. Consequently, the migration of these specialists leads to the situation of loss of brains.

Researchers of the cartography of the Moldovan diaspora abroad show that out of 9% of education specialists who emigrated from Moldova to the Russian Federation, only 3% continue their work in this field [39, p.22]. In the EU countries, out of 11% of education professionals who emigrated from Moldova to Italy, Portugal, France, and the UK, only 2% continued to work in their field of study, although not always at the same job (for example, in In Moldova, a person worked as a professor at a lyceum/university, while in Italy - as a nanny) [39, p.24].

In the recent past, the term "brain drain" included, first of all, already trained and educated specialists, and today there is a new approach and it also includes talented students. As in the case of other categories of highly qualified migrants, there is no exact data on the number of students from Moldova who study abroad. The total number is suggested by the Extended Migration Profile of Moldova for the period 2010-2015. However, these figures include only students who study under bilateral agreements or official programs. They do not include all other students who independently decide to apply to study abroad. Therefore, these figures are far from accurate [8].

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| Number of students | 4009 | 4270 | 5356 | 5891 | 5469 | 5485 |

**Figure 2.15. Number of Moldovan citizens studying abroad (2010-1015)**

**Source:** [220]

From figure 2.15. which include data regarding the number of Moldovan citizens studying abroad between the years 2010 and 2015 shows that there is a steady and continuous increase in the number of students studying abroad (about 4009 in 2010, and about 5485 in 2015 - an increase of about 36.8%), while in 2014, there was an extremely minimal decrease, what returned to rise again in 2015.

The Department of International Relations and European Integration of the Ministry of Education of the Republic of Moldova confirms that the Republic of Moldova has 30 bilateral agreements in the field of education and none of them encourages the return of scholarship recipients to the country. Therefore, it is unknown how many Moldovan students return to the country after graduation and how many foreign students to whom the Ministry of Education has offered scholarships remain in Moldova.

Various sources confirm the fact that there are no official data on people moving abroad for educational purposes, these figures differ from all sources. But on the basis of the agreements of the Republic of Moldova from 2012 to 2013, more than 24,000 thousand young people went abroad to continue their studies. International statistics do not approve of these data, explaining that the number of foreign students in Moldova is four times higher than official data. The main destination countries have significantly changed their policies regarding international students. For example, if in the past they were usually not offered the right to employment, now they are usually able to study and work [2]. Many countries issue residence permits to graduates, which entitle them to family reunification for the duration of their studies. General migration policies have changed in a way that encourages potential migrants to enroll and subsequently stay in these countries. Special programs are being created in developed countries to attract talented young people.

***How does the migration of highly qualified specialists affect the Republic of Moldova?***

Those few studies on this topic in Moldova, which substantiate the opinion that migration of highly qualified specialists brings positive effects, refer to the examples of large countries, such as China, India, etc. Indeed, the migration of highly qualified specialists/brain drain from such large countries demonstrates positive effects, which cannot be said about small countries, including Moldova. An interesting analysis of this aspect is made by Paul Collier in his book "Exodus: How Migration changes our World". Paul Collier talks about the existence of a so-called talent pool and incentives for education as an investment to access future emigration options [44]. In larger countries, the pool of talent is larger, and not all of these talented people manage to emigrate. And those who succeeded may not have been successful and returned to their countries. Therefore, the talent pool in large countries is not depleted enough to create a

crisis in the domestic labor markets. But there are studies that show that the negative effects of highly skilled labor migration occur only if a certain amount of migration exceeds the optimal "brain drain. Up to this threshold, migration can stimulate higher levels of educational engagement due to the benefits that people expect to invest in education by going abroad [39, p.10]. Paul Collier gives an example of the emigration of highly qualified specialists from Haiti to the United States. Haiti, with a population of 10 million, has lost about 85% of its educated population due to emigration. To compensate for this loss, a sevenfold increase in the number of talented young people is necessary [44, p.272]. It is unlikely that this will happen, so this country faces eternal stagnation. Another British researcher, Peter Stalker, also shows that a larger percentage of the highly skilled labor force emigrates from small countries: in Suriname, 89.9% of citizens with higher education currently live in OECD countries. This figure is more than 80% for Guyana, Jamaica, and Haiti [150, p.139]. Thus, small countries have the problem of maintaining an optimal level of brain drain, while large developing countries such as China, India, Brazil, Indonesia, Bangladesh, Egypt have no such problem. There is both growth of talents and migration of highly qualified personnel. However, these countries can maintain an optimal balance of brain drain and can create attractive conditions for highly skilled migrants, thus facilitating their return home [44].

One could say that for small countries, emigration is a flight of wits and a loss of human capital. And for large countries, migration can be a stepping stone to professional growth. As Paul Collier explains, a Chinese emigrant may see his experience in Silicon Valley as a step he needs to acquire in order to get a top position in a Chinese corporation [44]. This approach rarely works for smaller countries that do not have such opportunities. Drawing an analogy, it is clear that the Republic of Moldova, being a small country, suffers negatively from brain drain. Its talent pool will not be replenished, as is the case with other small and developing countries. Moreover, the lack of professional prospects will not motivate well-trained and experienced Moldovan migrants to return home.

Another important problem is that highly skilled Moldovan migrants, according to 2020 UNDP Moldova and ILO Moldova surveys, are employed in low-skilled occupations, especially in construction and domestic work- **Annex No' 22**.

According to the same study, there is also evidence of significant underemployment and, consequently, “brain waste” occurring before migration. This conclusion is confirmed by the NBS data, which showed that 25% of all people employed in Moldova with higher education were employed part-time. A similar situation, but on a higher scale, is typical for workers with specialized (38%) and vocational education (30%). This issue is also confirmed by the ILO: the

proportion of young people (aged 15 to 29) who do not work, study or undergo vocational training in Moldova is higher than in any other country in the region (29% in 2019), and according to government estimates, less than 40% of graduates are employed in the first year after graduation from the university [2, 4, 5, 208]. Thus, even before migration, the lack of communication between the labor market and educational institutions contributes to the graduation of young professionals who are not in demand by the national economy, a further increase in the number of Moldovan migrants.

Another argument that can be found in national migration studies is that the migration of highly qualified specialists increases remittances [39]. However, Paul Collier, shows that highly skilled migrants send fewer money transfers, this fact is confirmed through the use of point immigration systems and is most likely explained by the fact that highly skilled migrants are not going to return to Moldova, but on the contrary, they are looking for opportunities to join their family in the host country [44, p.292].

Actually, it appears that migrants with low qualifications tend to send more money transfers to their countries of origin. Consequently, Moldova will not benefit from a significant increase in remittances if it loses its skilled workforce.

Finally, another argument put forward by Paul Collier and Peter Stalker is that a brain drain is a form of aid to rich countries nor than poor ones. Such "aid" deprives poor countries of development prospects and increases these prospects for rich ones, making the gap between rich and poor countries greater. According to Peter Stalker, there are 3 million immigrants with college degrees in OECD countries, and if we invest 20,000$ in each professional's education, this will lead to a siphoning of about 60$ billion from developed to developing countries [150, p.145].

### 2.4. Conclusions of the 2 Chapter

1. The Interactions between global and national brain drain, (labor and educational migration) - The Israeli brain drain is part of a global phenomenon and is expected to increase in the near future. According to statistical data about 28 countries (western economies- in order to have a better comparison to the state of) In the years 2013-2020, the average measure for college and universities graduate immigrants per 10,000 residents is 12.40 while the Israeli number is higher than three times of this number- it is about 41.44. Although the Israeli brain drain is a global phenomenon, the rate of academic emigration from Israel to the U.S. is the highest and can't be compared to the western world. for example, the number of Israelis in the top 40 American departments in economics, computer sciences, chemistry, physics, and philosophy as a percentage of their remaining colleagues in Israel, is over twice the overall academic emigration rates from European countries. Basically, it's an active

process of educational immigration which is a part of the labor migration. The Israeli government is concerned about this migration, whether at the general level - labor migration or at the specific level - educational migration.

2. The development of the modern international labor market is affected by various main trends such as:

- the international labor market is growing at the expense of migrants from countries with economies in transition;
- increased competition in the global labor market;
- discrimination against migrants continues to exist;
- entrance barriers to the world labor market increase;
- the activity of trade unions, striving to defend the interests of the national labor force, is intensified;

The role of the ILO and other international organizations in the regulation of the international labor market is increasing.

3. The main market forces pushing for labor migration can be summarized as follows:

- the difficulty in finding employment, or the difficulty in finding employment that provides a livelihood in the mother country;
- Excess demand for work in different sectors in certain rations, in parallel with the excess supply of workers in the labor market of other countries;
- Demographic changes;
- political and socio-economic crises;
- Aspirations for career development and availability of promotion channels;
- Widening the wage gap between developed and developing countries, and between them.

4. Most researchers in the presented work agree with the fact that, the "brain drain" from Israel is in its essence a negative phenomenon for the development of the country and for its place in the world community. in our opinion, consideration of the problem needs approaches on the basis of which the picture of migration of scientists and specialists could appear as a component of the global world system.

The Bologna reform had managed to connect itself to the State of Israel. Despite its lack of acceptance to the European "academic zone", and being rejected twice, Israel continued establishing an academic response that is consistent with the reform demands and preserved its academic relevance in comparison to other higher education institutions around the world, by adopting several steps by the Israeli Council for Higher Education [169, p.72].

One of the major reasons for this accommodation is the interest in increasing the demand for academic studies in Israeli Universities [74, p. 326]. Within the framework of operating international programs in Israel, several programs exist, such as the DARE, TEACHES, and LAHAV Programs. But despite that, it didn`t bring a significant rise in the demand for academic studies in Israel [171]**.**

5. The exodus of intellect influences the economic development of the world and has both negative and positive effects on society. But still, the main beneficiaries remain the countries that receive these large flows of skilled capital and reap the full benefits of its activity.

6. Regarding ***the Republic of Moldova***, there are no official instruments for registering and monitoring highly skilled migrants; there are no normative acts aimed directly at the management of highly-skilled migration; and the existing tools have a fragmented and inefficient approach. Drawing an analogy, it is clear that the Republic of Moldova, being a small country, suffers negatively from brain drain.

Its talent pool will not be replenished, as is the case with other small and developing countries. Moreover, the lack of professional prospects will not motivate well-trained and experienced Moldovan migrants to return home. Another important problem is that highly skilled Moldovan migrants, according to 2020 UNDP Moldova and ILO Moldova surveys, are employed in low-skilled occupations, especially in construction and domestic work.

7. The work`s process included collecting data from all Israeli universities: Ben-Gurion, Bar-Ilan, the Technion, Tel Aviv University, the Hebrew University, the Weizmann Institute, and the University of Haifa.

8. Actually, several findings can be deduced from the collected and analyzed data:

- ✓ There were only a few cases where postdoctoral students abandoned their field of research and moved to completely different jobs unrelated to the fields of study and degrees they received. In fact, this phenomenon also shows that, as a rule, postgraduate and postdoctoral studies in Israel are appropriate, good, and rewarding [149, p.16].
- ✓ The high proportion of doctoral students who continue to work at the institution where they studied is noticeable [115, p. 13].
- ✓ The proportion of women completing a doctorate is higher than the proportion of men, but this picture is reversed when it comes to post-doctoral studies, especially abroad.
- ✓ A relatively high proportion of doctoral holders who went abroad for a post remained there [116, p. 28].
- ✓ The minority of Israeli Academia members leads to about 25 students per member, which is a bad numerical ratio relative to developed countries [148, p. 23].

## 3. THE MODEL FOR COMBATING THE ISRAELI BRAIN DRAIN: RESPONSIBILITIES AND RECOMMENDATIONS

### 3.1. The Phenomenon of Brain Drain in a Global vision and the Adopted Solutions and Strategies in Different Countries Around the World

In the proposed subchapter, the author will present a description of the solutions and strategies adopted by different countries to deal with the phenomenon of brain drain:

**I.** **Australia** has overcome the discussed phenomenon by achieving an extremely high academic level, and by being one of the leading in the world. In recent years, a lot of students around the world choose to study in Australia, and so, Currently, Australia is considered the third most popular country for international students, behind the United States and the UK. In some countries, Australia is the most popular choice for international study. Australia is a popular destination for international students for a variety of reasons, including the cultural diversity of the country, quality of education available, and friendliness of its inhabitants.

The National Strategy for International Education 2025 will enable Australia's international education sector to be more adaptive, innovative, and globally engaged. It will further strengthen our internationally recognized education system, increase global partnerships and drive collaboration with local communities and global partners. consortia and partnerships – to compete on a global scale [188].

**The New Colombo Plan Mobility Program in Australia –**

This program provides funding to Australian universities and consortia to support Australian undergraduate students to participate in the semester-based or short-term study, internships, mentorships, practicums, and research in 38 host locations across the Indo-Pacific region.

Actually, the State of Australia suffers at this time from negative migration and brain drain like many developed countries. The percentage of brain drain is not high, but it is very important to redesign the employment in some professions such as technical professions, software engineering, and medicine.

According to a study in 2014 by DIMA, real actions by the Australian government should be made, because the brain drain creates a negative bank employed, and there are similar reasons for academic mobility worldwide, namely, the desire to improve quality of life and professional development. Academic mobility in these countries serves as a mean of socio-economic advancement [73, p. 227].

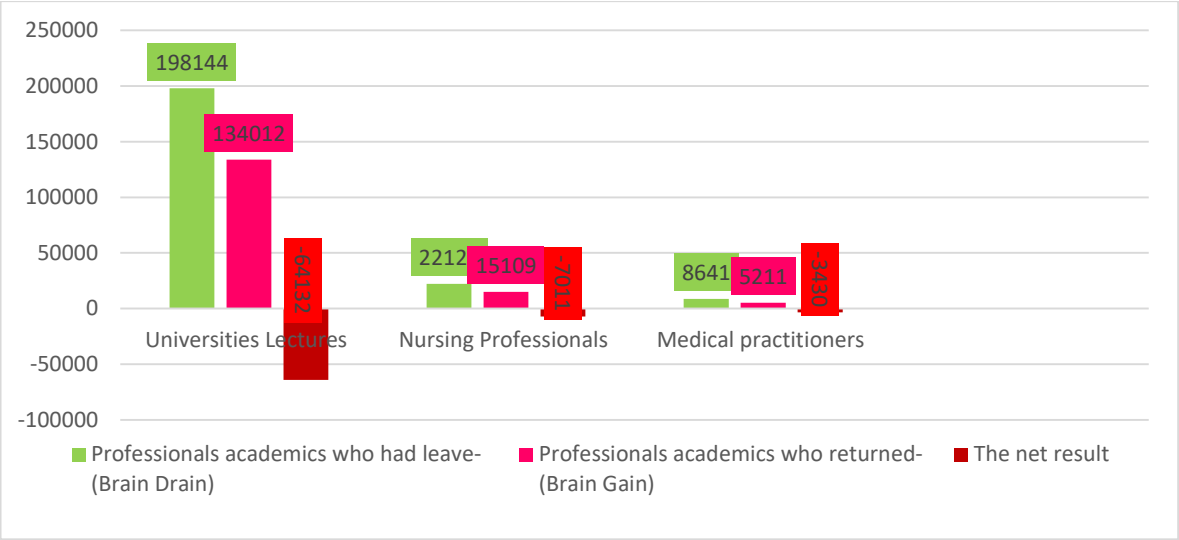



**Figure 3.1. Brain drain and brain gain of academics and professionals in Australia, 2010 – 2020**

Source: Made by the author from sources [45, 114, p. 14, 202]

An analysis of figure 3.1. which presents data regarding the brain drain and brain gain of academics and professionals (university lectures, nursing professionals, and medical practitioners) in Australia between the years 2010 and 2020 shows that there is a deep problem in medical practitioners and nursing professionals. This finding is in light of the professionals/academics who had left (brain drain), compared to those who had returned (brain gain), and accordingly the net result.

If so, the Australian government has adopted several actions and solutions, as the Israeli government has adopted, by supporting economic resources mainly in these fields.

**II.** The **United Kingdom** has adopted many solutions to combat the phenomenon of brain drain from it, while the main ones were reforms in the higher education system alongside joining international programs. Since 1999 The United Kingdom is a full member of the Bologna Process/ European higher education area. When UK accession to the Bologna reform, there was a clear division between universities, which provided research and advanced degrees, and colleges, which gave mainly undergraduate degrees and professional certificates. A decade after accession, the UK has completed the reforms of the Bologna process and reports the presence highest grade of all the indicators required [112, p. 29, 128, p. 778].

Although Britain is committed to the process, it attaches great importance to the autonomy of its institutions, admission criteria, curriculum, and foreign relations. It`s important to sign, that the British Council for Higher Education contains 2,743 institutions including universities, colleges, and specialized schools. Most of them are in England. In 2017, the national expenditure on education was 5.9% of GDP, and the national expenditure on higher education was 1.3% of

GDP [151, p. 317].

Actually, the UK Implemented many reforms and is one of the countries that run many international programs. One of them is the partnership with Erasmus + [128, p. 778, 185].

**III. The Republic of Moldova** has not paid due attention to the migration of highly qualified specialists, despite the fact that the economic potential of highly qualified workers is very high and they, being abroad, do not contribute to the development of their homeland. In Moldova, as in many other countries, there is no systematic legal approach to managing and controlling the migration of highly skilled workers. Therefore, national authorities should manage the emigration of highly skilled workers, support young professionals during the first 10 years of their activity in their home country, and develop strategic sectors where jobs for highly skilled workers can be created, e.g., IT (Information Technology) and ITES (Information Technology Enabled Services).

**IV. The** Ukrainian **has adopted a reform agenda. According to the reform, new administration promises to tackle the issue by first and foremost abolishing MPs' parliamentary immunity from prosecution. The move would be an important first step in improving Ukraine's image and creating a more hospitable climate for meaningful economic development.**

The judiciary is also in major need of reform, and cleaning it up is a top priority. The new administration appears to be deeply aware of the need for these reforms, and if so, Ukraine will grow up economically and develop closer relationships with the West.

It's important to investigate the controversial ruling of Ukraine's highest court on the issue of illicit enrichment. This aims to abolish corruption, and led to widespread public disapproval. It`s also important to maintain the country's course towards NATO and European Union (EU) membership, which is a clear sign to young talent and overseas investors [144].

**V. In global vision**, dealing with the issue of brain drain in different countries around the world has focused on common factors that are mainly raising the academic level and research performance and everything related to the academic system - reforms, strategies and more. And on the other hand, economic reforms related to employment conditions, salaries especially for experts and academics, increasing the quota of jobs and more.

In addition, there were concrete solutions regarding the causes of brain drain in the specific country, and applicable solutions in the specific context [105, p. 53].

Nevertheless, **the solutions can be summarized as follows** [105, p. 60, 121, p. 9]:

The Suggested Solutions and Policies Offered in Different Countries Around the World-

The report "Lack of qualified labor in Europe", prepared by the Advisory Committee for Industrial Research and Development, already in the early 1990s, indicated that the share of new

graduates of educational institutions entering the labor market was significantly lower than the share of devaluation of “intellectual capital”. This significantly reduces the effectiveness of the total labor force of developed countries.

Western countries are trying to solve this problem by various methods, by the modernization of production and increase in labor productivity of national personnel, the construction of enterprises abroad and the export of jobs, the mobilization of the economically inactive population (elderly workers, women), etc. However, we are convinced that using these methods the problem can only be partially solved.

In the meantime, a lot of experts say that this phenomenon is due to the shortage of skilled and qualified specialists mainly in information technology. For example, the growing shortage of highly qualified personnel in the United States is mainly covered by foreign specialists: from 1985 till 1996, 75% of those who defended doctoral theses in the natural and exact sciences were foreigners, and most of them chose to stay in the USA. However, the influx of highly qualified specialists into developed countries is not always explained solely by a shortage of labor force of the corresponding type. Referring to the calculations of a number of other American specialists (P. Ong, N. Matloff, R. Zaher), S. Makhroum emphasizes that today the demand for qualified foreign labor should be more and more tied to its relative cheapness of labor force, and not in response to staff shortages.

Actually, various policies are adopted by developing and developed countries from which skilled workers and intellectuals migrate, to combat the brain drain phenomenon and to minimize its effects. These policies are of four types [56, p. 35, 57, 117, p. 620, 126]:

1. Restrictive policy: The aim is to make it difficult for skilled workers to migrate and reduce it in general or in certain sectors where the supply of labor is already low.

2. Compensatory policy:

- Option diaspora as a source of economic development (resourcing), to compensate for the loss of human capital;
- reparation for loss caused by the loss of human capital by imposing a "brain drain tax" on the immigrant or the destination country (this policy was introduced in the 1970s and no longer exists).

3. Restorative policy:

- Encouraging return to the homeland, and recruiting skilled workers from abroad.
- Signing of international agreements (bilateral and multilateral) with countries of origin and destination, with the aim of restoring, at least in part, the human capital stock.

Rehabilitation policy requires the state to create incentives such as wage levels and

infrastructure similar to those in the countries to which skilled workers have migrated.

4. Development policy: Encouraging growth and economic development. This policy tool includes incentives aimed at encouraging the retention of skilled workers in the country and making immigration less worthwhile.

### 3.2. The Suggested Solutions of the State of Israel which aim to stop or minimize the Israeli academic brain drain and its Negative Effects– The author`s suggested national model and recommendations to improve the system

In recent years, the government has declared many times that it intends to fight the phenomenon of brain drain and return to Israel the "brains" that have left, so a national program for the restoration of academics was established in 2013, which took into account, both the suggested solutions and policies in different countries around the world, as mentioned in the sub-chapter above, and the needs of the Israeli economy, employment, and academic fields. Actually, until we succeed in bringing back the Israeli minds, it's important to integrate the Israeli "brains" who reside abroad in the related Israeli fields and get mutual cooperation.

The suggested program assists also in finding jobs in the industry and academic fields, accompanying the process of returning the Israeli "Brains" and their families, and providing individualized treatment for each academic and his family. Nevertheless, still, no significant achievements have been made [165, p. 18].

***Actually, the suggested solutions and policies that were offered to overcome the Israeli brain drain were:***

**In the Academic Field:**

The Israeli Council for Higher Education has adopted various reforms and held several changes such as [74, p. 336, 75, p. 487, 226, 227]:

1. Uniform accreditation of B.A. degrees, M.A, PH. D,

2. Quality control of the teaching and instruction of curriculum, unification, and recognition of curriculums;

3. A uniform evaluation of accreditation, which enables mobility of higher education students and academic staff.

4. The Israeli Council for Higher Education has recognized institutions in order to increase the accessibility to education.

5. The Israeli Council for Higher Education has encouraged the advancement of quality control and the methodological improvement amongst institutions of higher education,

6. The Israeli Council for Higher Education developed relevant dimensions in the general

higher education system, and, in particular – the curriculum,

7. the cooperation amongst institutions of higher education, training, and research.

**Projects and Programs Aim to Bring Back the Israeli Minds:**

**1-The Project of the "Centers of Excellence"**

The project of setting up centers of excellence is part of the implementation of a government decision from 2010 entitled " The Israel **Brain Gain** Program- Bringing Knowledge." The project includes the gradual establishment of 20 centers of excellence in the coming years in various research fields in the natural sciences and humanities. The budget construction and operation of centers of excellence will be a total of 1.35 billion. Yet, centers of excellence led to the return of only 15 scientists [216, p. 26].

2- **The Suggested National Program Aims to Restore Highly Qualified Specialists-**

the National Program for the return of academics established following the government's decision on the issue and launched in June 2013. The program's vision is the needs of the economy, the need for high-tech personnel, scientists, researchers, managers, and engineers. The program aims to ensure assistance in finding a job in industry and academia and to provide personal contact and attention to each individual academic, which should help them return to Israel [172].

**The Partners-**

The related bodies are the National Council for Higher Education and academic institutions and universities, the Planning and Budgeting Committee (PBC), various government ministries such as the ministry of immigrant absorption, the social security, the ministry of education, IDF, the ministry of tourism and the local municipalities.

The Israel **Brain Gain** program aims for all Israelis living abroad and their families who are interested in returning to Israel throughout the entire process of returning from finding a suitable job until adapting to daily life in Israel, providing they hold a Bachelor`s degree or above. The program will assist them with: Finding employment in Israel, directly contact employers while still abroad, getting information about the proposed plans, and ensuring and providing all the information that the family needs [147, p. 316].

The Center for Absorption in Science helps employers with assistance which will be given in the form of participation in funding the cost of employing the scientist in R&D work, provided he meets the determined conditions [16].

**The Strategy for Developing a Policy and a Comprehensive Initial Model for Dealing with the Israeli Brain Drain-**

It is very important to formulate a legal and legislative policy that aims to stop the demand for Israeli students and academics to study, work and live outside of Israel. Such policy Intends to

deal with the situation on the ground and suggest solutions.

The author decided to construct, and formulate an economic national-organizational model based on the data presented in the previous chapter- chapter 3, which aims to give an answer to the research's question and hypothesis in the proposed research, and stop or even minimize the demand for Israeli students and academics to study and live outside of Israel. Such a model is combined with a comprehensive program that addresses large-scale responsibilities.

**THE PROPOSED MODEL-**

The synthesis of the data from the previous chapters, the strategies and solutions taken in different countries around the world to deal with the phenomenon of brain drain, along with sharing related and responsible bodies in the state of Israel, served in offering a comprehensive approach and analysis that addresses the issue of the Israeli brain drain and academic mobility of students of higher education, at national and international levels, and were as the cornerstones for the proposed model by the author, what constitutes as a scientific novelty and originality of the research due to the fact that it research includes developing and presenting an innovative economic model and solutions, developing a qualitative model of the circulation of intellectual resources, assessing the current regulation of international migration of intellectuals and providing methodological recommendations, formulating the principles of state policy in the sphere of migration of intellectuals, and providing innovative recommendations to the Israeli Ministry of Education and related Ministries which aims to reduce the demand for academic mobility and brain drain and minimize its dimensions.

1. **Academically:**

| Degree | Year 1 | Year 2 |
|---|---|---|
| **Master's** | 44,280 | 22,140 |
| Employer | 6,500 | 6,500 |
| **Doctoral** | 61,500 | 30,750 |
| Employer | 9,000 | 9,000 |
| **Physicians** | 47,340 | 47,340 |

**Figure 3.2. The Israel's Academically Ranking at the International Levels**

The rate of academic growth, Ranking of the Israeli Universities and the R&D outputs -

It is very important to ensure a high ranking of Israeli universities compared to leading universities around the world. University rankings are based on different combinations of different metrics from a wide variety of sources. The rise in the types of methodologies and criticism indicates that there is no broad consensus on the subject, and yet special attention is paid to these ratings and they also have practical and economic implications. The ranking may contribute to the prioritization of individuals, institutions, and countries as well as to promoting competition. However, it is not an exact science and its results depend on the details of the methodologies [200, 223].

There is a direct connection and correlation between the R&D outputs in Israel and its trends as it is reflected in scientific publications over time and in an international comparison with Israel's ranking academically at the international level [179].

The author recommends increasing the dimensions of productivity in research and development and the rate of academic growth, which will lead to an increase in the number of publications and especially in the number of publications per capita. In an international comparison, Israel's ranking continues in a declining trend in various productivity indices: the number of publications, the number of publications per capita, and its share in world publications. This decline is due both to Israel's internal factors (low academic growth rate that actually leads to a stagnation in the number of publications and especially to the number of publications per capita) and to global factors (steep growth in the number of publications in general, and in developing countries in particular) [183, p. 22].

Israel shows an increase in all measures of scientific influence, but this does not keep pace with the rate of increase in other countries, so Israel's ranking among the countries that published at least 0.5% of world publications decreases. So, it's important to increase all measures of scientific influence in a manner appropriate to the international publications and levels.

**1.1. The Number of Academic Institutions and the Universities Supply-**

There is a connection between the number of academic institutions and the universities supply to the number of students going to academic studies, and the number of outbound students. The analysis of the data shows that the greater the number of universities, the greater the competition between universities, and then also their supply increases in terms of the subjects of study and the proposed faculties. Such wide supply, eases the admission requirements for universities, especially in the requested faculties [179, p. 18].

Such variety and admission criteria, will bring the Israeli students' satisfaction from what the universities offer them, so they won’t search for an alternative outside of the Israeli borders. in parallel, the supply of institutions will even attract foreign students.

So, the author recommends increasing the number of universities and the universities supply to the diverse student's population by supplying and offering various subjects and faculties. Actually, the proposed national model aims to supervise the Israeli academic activity in all aspects related to the Israeli`s academic brain drain as well as mobility to Israel [180, p. 28, 215, 226].

**2. <u>Integrated Academic-Economic Topics-</u>**

**2.1.** There is a direct correlation between **the number of academics, specialists and researchers leaving Israel and the level of salaries they receive**. According to data analysis, the salaries they receive do not match and fit the level and quality of academic and research work they do, nor their contribution to the Israeli science and research field, both at local and international levels. Therefore, the author seeks to raise and adjust the salary level of Israeli experts to the level of their performances and their contribution to Israeli science and academia, which will bring them economic and social satisfaction [60, p. 1168, 102, 183, p. 23, 205].

**2.2.** There is a direct correlation between **the number of experts leaving Israel and their academic conditions, which means:** respectful academic status, favorable employment conditions with freedom of choice, a flexible system that is customized to the needs and convenience of the experts alongside the academic and research needs, and more. According to them, their education, professionalism, experience and tremendous contribution to science are not well valued and do not fit their academic status in the Israeli institutions [102].

According to the author, this is a very important and crucial issue for solving the problem of highly qualified brain drain. It is important to bring these "brains" into satisfaction and contentment, by fitting their education, professionalism, experience, and tremendous contribution to science to their academic status and to the salaries they receive.

**2.3.** there is a great need for **immediate reform** in order to upgrade the higher education system and compete with parallel systems in countries around the world. The first step in such an arrangement should start from the tuition fees, **since the tuition of international students in the programs should be adapted to the European countries with similar academic standards** and in accordance with the reform countries in Bologna, Europe, and the OECD countries [200, 222, 227].

**2.4. The career paths of doctoral students and the number of academic positions available for post-doctoral students-**

Doctoral students and post-doctoral students are key factors in the advancement of scientific research and contribute greatly to the success of activities in research laboratories in academia, industry, and government research institutes. So, it is important to formulate recommendations for policy-making related to the careers that doctoral students choose, which aims to promote solutions

and to bridge the growing gap between the number of postdoctoral students and the number of academic vacancies [10, p. 46, 102, p. 945, 110].

**2.5. Research Grants in the Academia-**

In analyzing the relationship between research grants and the number of publications and their impact, the main research outputs in academia are scientific publications. An analysis of Israel's publications shows that ISF grants make a significant contribution to the number of scientific publications in Israel and their scientific impact. Basic government-supported research mainly in academia is a public asset that can be applied in many different industries and for many years to come. Government funding Accelerates and promotes the innovation that leads to job creation, a competitive industry, and entrepreneurial success. So, the author recommends increasing and expand the research grants and funding to academia [183, p. 23].

**3. Government Funding Bill for Academic and Research Institutions-**

In light of the strong and significant correlation between the gross domestic expenditure and the number of Israeli outbound students, it is advisable to legislate or re-evaluate all legislation regarding government funding for academic and research institutions, in order to support academic publications, since high investments in higher education and research fields will be applied in various different industries and employment fields in the future, what will lead to job creation, a competitive industry, and entrepreneurial success [49, p. 16, 163, p. 82].

**4. The Involvement and Integrating of the Local Councils and Municipalities as an Advisory and Supportive Partner Organizations-**

Municipalities have a huge responsibility in raising awareness among students and their parents in the earliest stages in everything related to academia such as admission requirements, fields and subjects of study, manner and forms of study, duration of the study, conduct in academia, opportunities and risks, and all relevant information. This is very important because a very large proportion of high school students have no idea at all about what is going on in academia, which makes it difficult for them to make decisions or even make wrong decisions regarding the field of study, which institution to choose, curriculum and all related issues. In many cases, such decisions lead to latent and overt dropouts in students, to professional retraining, to low achievement, which makes it difficult for students to complete their studies on time or even not to continue to higher studies. This has also other effects such as economic effects because students pay more and more tuition, psychological effects because they are not satisfied and others.

In parallel, the arrival of foreign students will bring foreign money into the local business systems, which certainly has a positive economic impact on the host cities. Therefore, local authorities should ensure that as many foreign students as possible arrive, and for this, they should

take care of everything related to international programs ran by the national institutions of higher education, besides all related to hosting conditions and requirements.

**5. Encouraging So-Called" Academic Tourism"-**

Enact "student tourism" regulations that offer all kinds of attractions and packages that are suitable for students. This will attract more and more students, which will lead to **huge economic benefits**, both from tuition, rents, living expenses, and everything related to the arrival of foreign students to the country. On the other hand, this will help the **marketing of the Israeli academy** and contribute to it. A similar move was made in Spain and yielded a lot of success [109, p. 2-3].

**The Existence of International Relations** -

It is important to get advantages of the stay of Israeli students abroad and of foreign students in Israel, and developing relationships and collaborations with foreign countries. Such collaborations in all kinds of fields: academic, economic (industrial, agricultural, and commercial), tourism, health, technology, political, social and others, may promote relationships and bring significant benefits to both parties and indirectly to the global level as well.

In the proposed model, the author believes that in order to overcome the problem of Israeli brain drain and even achieve **brain gain**, it is important to share and integrate several related institutions, authorities, strategies, and programs, which are supposed to work in coordination and collaboration as detailed below.

**The Related Bodies and their responsibilities- Annexes No' 41, 42**

**1. The Following Ministries:**

**1.1.** The Ministry of International Relations is responsible for promoting international programs, getting advantages of the stay of Israeli students and specialists abroad and of foreign students and specialists in Israel, and developing relationships and collaborations with foreign countries.

**1.2.** The Ministry of Truism is responsible for refreshing and upgrading the marketing system specially "student tourism" regulations in order to encourage so-called "academic tourism". This will lead to huge economic benefits, from all related to the arrival of foreign students to Israel, besides the marketing of the Israeli academy.

**1.3.** The Ministry of Finance is responsible for:

I. Budgeting and financing the model.

II. Raising the salaries of researchers, lectures and experts. It is important to bring them into satisfaction and contentment by raising and adjusting their salary level to their performances, and improving their academic conditions.

III. The allocation of a larger quota of standards and jobs for lecturers and researchers.

IV. Providing economic benefits and all kinds of discounts and facilitation to lecturers, researchers and high qualified educated people, in order to keep them and not think about the option of escaping from Israel.

V. Increasing the number of academic positions available for post-doctoral students-

It is very important to find solutions that bridge the growing gap between the number of postdoctoral fellows and the number of vacancies.

VI. Increasing the research grants and the sources of funding for academic research in Israel.

VII. The responsibility for budgeting a part of the foreign students' tuitions and all that accompanies in order to attract foreign students to study in Israel, and the adjustment of the student's tuition to the international tuition in these programs with similar academic standards and in accordance with the reform countries in Bologna, Europe, and the OECD countries.

VIII. Increasing the number of universities.

**1.4.** The Ministry of Education is responsible for:

I. The universities ranking- It is very important that Israeli universities be ranked at a high level according to various indices, criteria, and methodologies in an international comparison. The high ranking may contribute to the prioritization of individuals, and institutions, as well as to promoting competition, which will increase the demand for academic studies at the Israeli universities. So, there is a great need for an immediate reform in order to upgrade the higher education system and compete with parallel systems in countries around the world. This means, adopting innovative teaching methods, diverse and up-to-date teaching strategies, available applications and clear set-ups. In parallel, the tuition of international students in the programs should be adapted to the European countries with similar academic standards and in accordance with the reform countries in Bologna, Europe, and the OECD countries.

II. Research and development productivity and academic growth-The author recommends to increase the dimensions of research and development productivity and the rate of academic growth, which will lead to an increase in the number of publications and especially in the number of publications per capita. Actually, it's important to increase all measures of scientific influence in a manner appropriate to the international publications and levels.

III. Variety and diversifying faculties and subjects- It`s important to offer and supply the student population variety and diversifying faculties and subjects. So, institutions should adopt unique and attractive programs which attract more and more students and provide a response to the demand of both Israeli and foreign students. Such variety will bring the Israeli students, satisfaction from what the universities offer them, so they won’t search for an alternative outside of the Israeli borders. On the other side, the supply of institutions will also attract foreign students.

IV. Academic institutions should follow and keep pace with the modern technology adopted in the developed countries.

V. formulating recommendations and policy-making related to the careers that doctoral students choose, which aims to minimize the gap between the number of postdoctoral students and the number of academic vacancies.

**2. The Government-**

**2.1.** Government Funding and Support-The government is responsible with collaboration with the ministry of finance for 5funding and increasing the research grants to the academia. Also, it is responsible for legislation regarding government funding for academic and research institutions.

***2.2.*** laws and regulations- *The laws that need to be updated are mainly the laws related to the ministry of education and ministry of employment such as tax breaks for academics, and the budgeting of employment standards for researchers and academics. Also, t is advisable to legislate or re-evaluate all legislation regarding government funding for academic and research institutions.*

*The Government is also responsible for enacting laws and regulations concerning aspects related to the model itself, as well as other aspects related to the responsibilities of the various bodies and ministries related to the model.*

**3. The Local Municipalities**-

Municipalities are responsible in raising awareness among students and their parents in the early stages in everything related to academia including international programs such as admission requirements, fields and subjects of study, manner and forms of study, duration of the study, conduct in academia, opportunities and risks, and all relevant information. In parallel, local authorities should ensure the arrival of as many foreign students as possible. So, they should take care of everything related to international programs run by the national institutions of higher education, besides all related to hosting conditions and requirements.

**4. Related Stakeholders and Partnerships** such as Universities, Academic Institutions, The Council for Higher Education in Israel, and the Ministry of Justice.

**5. Strategies, Programs, and New Systems**-New and appropriate strategies, programs, and systems should to be activated and adopted in all fields:

I. Strategies, collaborations and international relations in different fields: academic, economic (industrial, agricultural, and commercial), tourism, health, technology, political, social and others,

II. The Education system should adapt international academic programs and run marketing

system and program in the best way in order to prevent the Israeli brain drain and raise the number of foreign students in the Israeli institutions.

The responsibilities of the related ministries and bodies for the operating, financing, and supervision of the implementation of the model are presented in table 3.1., as follows.

**Table 3.1. The responsibilities of the ministries and bodies related to the operation, financing and supervision of the implementation of the model**

| **The related ministries and bodied are responsible for:** | | | | | |
|---|---|---|---|---|---|
| **The Government -** 1- funding and increasing the research grants to the academia. 2- Updated legislations and lows regarding governmen t fundings and aspects related to the model. | **The Ministry of education-** 1-An immediate reform and upgrading of the academic system. 2- Adapting the tuition of international students in Israel. 3- Increasing productivity in research and development, the academic growth, and measures of scientific influence. 4- Diversity of the demanded study subjects and faculties by Israeli and foreign students. 5- Adopt attractive programs 6- TO keep pace with modern technology. 7- Policy-making regarding the fields available to doctoral students. | **The Ministry of Finance-** 1-budgeting the model and academic system. 2-Raising the salaries and improving academic conditions. 3- Larger quota of standards and jobs 4- Benefits and discounts 5-Increasing the number of academic positions for post-doctoral students. 6-Increasing the research grants and funding. 7-Budgeting a part of the foreign students' tuition. 8-Increasing the number of academic institutions. | **The Ministry of internationa l relations-** 1-Promoting International programs, 2- getting advantages from the stay of Israeli students and specialists abroad and vice versa 3-developing collaboration s with foreign countries. | **The local Municip alities-** 1- Raising awarene ss among high-school students. 2- Ensuring the arrival of foreign students | **The Ministry of truism-** Refreshing and upgrading the marketing system and "student tourism" regulations. |

Source: Made by the Author- **Annexes No' 41, 42**

Actually, an analysis of table 3.1. shows that the responsibility for operating the model and achieving the goals which aim to prevent the drain of the "Israeli minds" and to bring back as many "brains" as possible that have already drained is divided and intersected among the following bodies as detailed below:

1. **The Government** - The model will be funded by the government for at least 5 years, while the subtotal cost of the investment per a year is about 36,100,000 US $, but will be operated independently. The government is also responsible for unifying all the bodies involved in the operation of the model on all its components. The ministries of education, economics, and international relations, besides related municipalities will have a heavy responsibility in terms of designing, operating, and monitoring the operation of the model in the best way. So, the laws related to budgeting should be updated, tax breaks for academics, the budgeting of

employment standards for researchers and academics, and other policies should be changed.

2. **The Ministry of Education** - the ministry's responsibility is to Improve the teaching infrastructure in all spaces, adapting new academic programs including international programs, curricula, and teaching methods.

   - The Ministry of Education`s strategies:

The strategies for the Ministry of Education are to create and enable "an economical-educational-and professional umbrella" which aims to reduce and minimize the brain drain and academic mobility of Israeli students, by considering new policies and taking the following steps:

I. Choosing the right policies in accordance to the relevant ministries.

II. An overall contribution from brain drain and academic mobility by sharing international interests with other countries, especially the academic bases.

III. Investment and budgeting universities, Institutions of research, the research infrastructure the and the National Science Foundation with millions of dollars in the next coming years.

IV. Ensuring, activation, and assimilation of new strategies, programs, and systems in the Academic and research fields. Also, adapting international academic programs and running marketing programs.

V. Cooperation and collaboration with the related ministries, especially the Ministry of Tourism which aims to market the Israeli academia in target countries according to an understandable strategic plan, and allow and offer packages for foreign students studying in Israel.

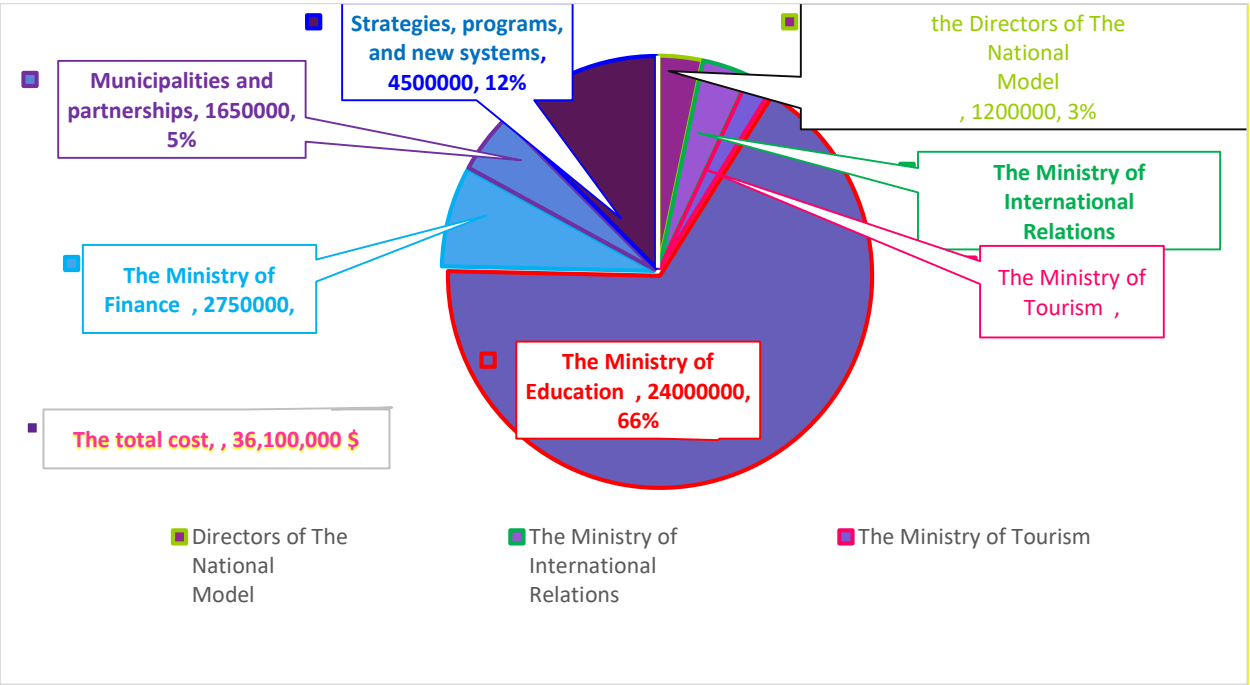



**Figure 3.3. The financial estimated costs of the Model per a year (US $)**

Source: Made by the author

According to Figure 3.3., the subtotal total cost of the investment per a year is about: 36,100,000 $.

**The different responsibilities related to the model and its implementation:**

**1. The Ministry of Economic and Finance** is responsible for funding the model, the reforms, systems, scholarships and all the expenses.

**2. The Ministry of International Relations** is responsible for all foreign relations and transactions related to Israeli students and academics outside the country, foreign students inside the State of Israel, as well as all international programs.

**3.** The model should include and involve **official bodies and related stakeholders** from all aspects involved to the model.

**4. The Ministry of Tourism** will take responsibility for marketing the national Academy, Universities, Institutions, and Israeli programs and projects around the world.

**5. The Municipalities`** responsibilities are to strengthen the partnership with the Israeli academy and raising the awareness of the high school students and their parents in all related to the Israeli Academy.

### 3.3. Conclusions of the Chapter 3

1. Many countries tried to deal with the phenomenon of brain drain and academic mobility of students and suggested solutions and processes deal with the phenomenon. These strategies increased GDP during these years.
2. The Israeli government has a huge responsibility because it needs to find a comprehensive and thorough solution and stop discrimination in favor of Israel's business sector. The Israeli government must support potential start-up entrepreneurs, including Arab entrepreneurs since such support is certainly essential to the Israeli economy.
3. The academic Universities and Institutions in Israel have established a comprehensive system of academic study frameworks, while the leading universities are Tel Aviv University, Ben Gurion University, and the Hebrew University.
4. The suggested model aims to enable national multi-system strategic solutions for dealing with, *managing, and reducing the phenomenon of the Israeli brain drain and even enables a future forecast. Furthermore, proposing and finding solutions to the labor market problems involved and affected by the brain drain phenomenon both at the local and global levels.*

The dependent variable is the number of Israeli outbound academic students, professionals, and highly qualified academics. The independent variables explain the dependent variable, which

is the reason for the Israeli brain drain and academic mobility.

*It is important to note that the model has been already submitted to several related ministries, institutions, and related bodies, and there is an initial agreement to adopt the significant parts of it in the academic, economic, and employment fields, after completing and finalizing all the research work and making the required changes and adjustments.*

Actually, the model aims to get the following aspects:

i. A significant increase in investment in education especially in academic education and a significant increase in the number of academic institutions and research institutions in the periphery as well as in the central cities of the country.
ii. Government investment in academic infrastructures which include: the establishment of institutions, centers of excellence, tax benefits, raising salaries, positions for researchers, professionals, and academics, personal and professional development options, and housing solutions.

This will lead to an opportunity for the creation of international relations with other countries in order to cooperate with other academic systems in a similar situation.

While the total estimated costs of the model are about 36,100,000 $ per year, in parallel, the practical estimated solutions are mainly academically, economically, and occupationally:

1. Educationally:

I. Improving the educational system, including elementary education, due to the biggest obstacles in obtaining a balanced system.

II. The government should demonstrate a sincere commitment to support research while allowing scientists to remain as independent as possible, and creating scope for scientific research.

2. High salaries, equivalent to their specialties.
3. Political and employment stability, besides other solutions.

Actually, the proposed model aims to offer a comprehensive solution to the problem of the Israeli brain drain and its impacts on the local labor market, as a continuation of the steps and plans that the Israeli government took earlier but didn`t succeed to bring back Israeli brains.

Although there are a lot of specialists in Israel, it will take a long time for them to attract others and make Israel one of the world's leading nations for technical innovation. But, if this brain drain is in a form of a **cycle**, there won't be any problems if they assure to come back to Israel. maybe the talents they used and the works they did in other countries were more, but the resources they own always remain. if they can implement the work in Israel there will be a good future in Israel.

## GENERAL CONCLUSIONS AND RECOMMENDATIONS

Israel's stagnant labor productivity, increasing tax burden on the educated population, and rising cost of living threaten the country's ability to retain its most skilled citizens. While the number of emigrants may be objectively small, it has a disproportionate impact on the most educated segments of the population - those who help Israel stay ahead on the technology front.

The academy has a major part in the steering of the economic-social society towards a better future. Globally, not only in Israel, due to the changes in various fields (demographic, economic, social, cultural, technological, and educational changes), professionals and specialists don't hesitate to move to foreign countries in order to advance professionally or academically and to change their standards and quality of life.

Actually, we are witnessing a trend of brain drain from various developed and developing countries all over the world of all kinds-educational mobility, labor mobility, social mobility, cultural mobility, and other kinds of mobility.

In The proposed research, the author of the thesis discussed this phenomenon of brain drain by providing National and international theoretical background, various definitions of related concepts, a presentation of the data, an analysis of the presented data, and most importantly building a preliminary and comprehensive model that offers solutions, strategies and clear formula of actions in order to overcome the problem of the Israeli brain drain, including the ministries, authorities, institutions and other related bodies involved in the process and the responsibility of each of them, including estimated results, and presenting the overall conclusions and recommendations, which the author of the thesis aims to offer to the involved authorities alongside the model in all its details as a practical scientific-economic novelty in order to reduce and minimize the dimensions of the phenomenon of Israeli brain drain and its influences on the Israeli labor market and reach a long term and stable solution, even relatively with comparison to the international situation and solutions offered in different countries around the world for dealing with the discussed phenomenon.

<u>The results of the research obtained by the author on a global level:</u>

1. A general scheme has been developed that conveys the strategic trend of the development of migrations in history by taking into account the main factors, the needs for economic development, and the use of populated territories at the most important stages of migration of peoples and groups.

2. General and specific tendencies of migration of intellectuals are identified and systematized, confirming the assumptions about the growing disproportion in the world economy.

3. A classification of factors responsible for the migration of intellectuals is made, with

the presentation of controlled factors and the rationale for the specificity of the process for the countries of the core, semi-periphery, and periphery of the modern world system.

4. The expediency of using the world-systems approach to study the migration of intellectual resources is substantiated, which makes it possible to clarify how the process influences individual countries and the world economy as a whole, reflecting the balance of losses and gains for countries of exporters and importers of intellectual labor.

5. The available forms of accounting for indicators of international migration flows of professional elites in countries with different levels of development have been evaluated, the main reasons for their imperfections have been identified, the principles of control methods and the possibility of participation of Israeli universities in organizing intellectual migration studies have been substantiated.

6. The principles of the state policy in the sphere of migration of intellectuals were formulated and regional recommendations were given.

The main provisions and conclusions of the study were approbated during the author's speeches at international, Israeli, and interregional scientific conferences and seminars.

**Conclusions:**

The scientific novelty of the dissertation research consists of the following, in global and national stages. The concept of "migration of intellectuals" has been introduced and presented as specific mobility of labor resources carries fundamental knowledge, which contributes to the innovation component of scientific and technological progress, by distinguishing mobility of various types of labor and expanding the analysis of migration across the world systems.

A qualitative model of the international movement of intellectual resources has been suggested. It differs from the previously known synthesis of the elements of the intellectual and innovative potential of countries belonging to different levels of development and allows to clarify the place of scientific knowledge in the modern world economy and to present the growing trends in the concentration of intellectuals by the countries of the core of the world-system, the deepening contradiction between the open, humanistic and creative nature of scientific work and the elements of hegemony embedded in the principles of the modern world-system.

1. The principal necessity is substantiated and methodological recommendations are given on the establishment of accounting for the migration of intellectuals in domestic settings based on the organizational capabilities available to scientific organizations and higher educational institutions in order to form an adequate presentation of the “brain drain” process from Israel and the development of based policy at the national and regional levels.

2. On the basis of homeostatic and categorical-system methodology, a qualitative model has

been developed. The model allows presenting of the main trends and conditions in the sphere of international migration of intellectuals, as well as the methods of modeling situations, such as counseling, and the decision-making process, making the system accessible for the application of modern methods of management.

3. The conceptual bases for the formation of the strategy of different bodies in the state of Israel are suggested, allowing to carry out an effective policy in the sphere of intellectual mobility, aimed at protecting the geo-economic interests of Israel.

Actually, the proposed study aims to provide a professional and reliable basis for a worthwhile coping of the systems of academic education alongside the economic system, and of the decision-makers with the phenomenon of Israeli brain drain. Furthermore, the proposed research can also be used and provides strategies and policies for dealing with this trend in different countries around the world with regard to social, economic, and academic essence in each of them.

4. The Ministry of Education and the Institution of Higher Education are responsible for all the educational and academic elements and issues- professional content, academic strategies that are implemented, the Academic process, as well as increasing the financial investments aimed at the establishment of new and modern academic institutions.

Practically, the Council for Higher Education is responsible for the operating, implementation, and steps that should be taken according to the proposed model, which aims to decrease the academic brain drain and outbound students, in parallel to increasing the demand for academic studies in the Israeli universities by foreign students.

5. Brain drain is a worldwide social phenomenon, which even developed countries such as Germany, Australia, and the USA suffer from. lately, due to changes in various fields (demographic, economic, social, cultural, technological, and educational changes), professionals and specialists move more than ever to foreign countries, in developed and developing countries, in order to advance professionally or academically and to improve their standard and quality of life. Actually, there are several kinds of brain drain, while the academic drain is the main one, due to the fact that it may lead to any other kind of mobility.

6. Educational drain means, the movement of students, lecturers, specialists, and researchers to another country as a desire for higher education and development both professionally and personally, and receiving self-realization. From the host countries' perspectives, it's a source of qualified workers, either during their studies or through subsequent recruitment.

7. The State of Israel has to take actual steps to change its economic occupational policies with regard to its major target populations (researchers, lecturers, engineers, medical doctors).

8. We can solve a certain part even partially, of the problem by applying what is so-called

"Educational tourism" which means a combination between the academic world with its target populations (students and lecturers) and the world of tourism.

9. The tuition for Israeli higher education students in Israeli Universities isn't relatively high, and there are a great number of various scholarships that students are able to get, but the major problem is the limited availability in the prestigious faculties, such as medicine, pharmaceuticals, veterinary medicine, clinical psychology, and computer engineering which leads to an aggravation of admission requirements for these professions. As a result, many students are not accepted and decide to study out of Israel which's the easiest admission requirement.

10. Characterization of career paths of Israeli doctoral students. Doctoral students and post-doctoral students are key factors in advancing scientific research and contribute a lot to the success of the research fields in academia and research institutes. Actually, doctoral students and post-doctoral students along with the Masters are the primary and cheapest army that contribute major performances to science missions in academia. So, the careers, doctoral students choose, are so important in order to build suitable study programs` models and policy-making that will promote important activities according to the required careers and allow solutions to bridge the growing gap between the number of postdoctoral students and the number of academic vacancies.

11. According to the Israeli Council of Higher Education and the databases of the OECD and UNESCO, the number of Israeli outbound students in various countries around the world Is about 15,120 (estimated- since not all Israeli students studying abroad and not all Israeli experts working abroad are registered). The most sought-after professions are medicine, pharmacy, nursing, high-tech, engineering, especially computer engineering, architecture, business management, and law.

The countries most in-demand by Israeli students are, Romania, Germany, Moldova, Italy, and some of the Eastern European countries, and for the Israeli Arabs, also Jordan, and the Palestinian Authorities. Also, the USA is relatively demanded by Israeli students, especially Jewish even though there are high tuition and accompanying costs. The less sought-after countries were Britain, due to high tuition and accompanying costs.

12. The State of Israel does not have a great deal of economic-academic partnerships with other countries, except for some countries like Germany and the USA, and these partnerships are in specific fields such as hi-tech, medicine, and research.

13. Israel's capacity to keep its most skilled citizens is threatened by the country's stagnant labor productivity, rising income taxes, and rising living expenses. Even though there aren't many people leaving Israel, those who are best educated and contribute to the country's technical advancement are disproportionately affected.

14. The academy has a major part in the steering of the economic-social society towards a better future. Globally, not only in Israel, due to the changes in various fields (Changes in the population, economy, society, culture, technology, and education), professionals and specialists don't hesitate to move to foreign countries in order to advance professionally or academically and to change their standards and quality of life.

15. Actually, we are witnessing a global trend of brain drain from both developing and developed countries- educational mobility, labor mobility, social mobility, cultural mobility, and other kinds of mobility.

16. In The proposed research, the author of the thesis discussed the brain drain phenomena by providing National and international theoretical background, various definitions of related concepts, a presentation of the data, an analysis of the presented data, and most importantly Building a preliminary and comprehensive model that offers solutions, strategies and clear formula of actions in order to overcome the brain drain problem in Israel, involving the ministries, authorities, institutions and other related bodies involved in the process and the responsibility of each of them, including estimated results, and presenting the overall conclusions and recommendations, which the author of the thesis aims to offer to the involved authorities alongside the model in all its details as a practical scientific-economic novelty in order to reduce and minimize the dimensions of the Israeli brain drain and its influences on the labor market in Israel and reach a long term and stable solution, even relatively with comparison to the international situation and solutions offered in various world-wide countries for dealing with the phenomenon under discussion.

17. Yet, the State of Israel, couldn't succeed to solve the brain drain problem in Israeli and coping with the rising demand for academic mobility among Israeli students who desire to continue their studies overseas. The author suggested steps and recommendations and established a national model that is meant to provide overall solutions to the problem of brain drain in Israel and associated issues, which enables a stable future for the long term, forecasting, and scientific importance. The main factors that can stop the brain drain phenomenon are salaried satisfaction alongside investment in all related to the Israeli academy, studies and research field, academic infrastructures, and the work positions of lecturers, specialists, and researchers. In light of the results of the study, the main reasons for the brain drain phenomenon in Israel are:

1- seeking out quality education,

2- The high rate of unemployment in several professions;

3- The desire to pursue better work and professional prospects abroad;

4- Low salaries in comparison to high living expenses and high tax rates. Actually,

numerous research indicates that wage satisfaction is the only way to access even partly solution.

5- Inferior academic education;

6- Other personal preferences.

18. Regarding the ***Republic of Moldavian brain drain*** we can draw the following conclusions:

- ✓ The migration of highly talented migrants has negative effects on Moldova since it is a small and developing country, and Moldova will not be able to maintain the optimal level of highly skilled labor migration like other countries in comparable reality and conditions.
- ✓ Remittances to Moldova won't significantly rise as a result of the movement of people with high levels of education.
- ✓ The lack of communication between the labor market authorities and universities and academic institutions, contributes to a further increase in intellectual labor waste.
- ✓ Several primary causes of the brain drain are searching for economic and political stability, research opportunities, better jobs and high salaries and better living conditions.
- ✓ While highly talented professionals have enormous professional potential when they work in their native countries, after migrating, they do not contribute as much to their countries (except by sending money to their families).
- ✓ There are neither national regulations nor systematic legal strategies to govern and monitor the migration of highly skilled workers and specialists.
- ✓ The author agrees with the existence of the brain waste problem but considers it very controversial to argue that the migration of highly qualified specialists will have a positive impact on Moldova.
- ✓ The Moldovan authorities do not pay enough necessary attention to highly qualified migrants. If so, the national authorities should prioritize [3]:
- ✓ The management and control of the emigration of highly skilled workers,
- ✓ Adaptation and academic-occupational cooperation, which means, adjusting the supply of academic institutions to the demand in the labor market,
- ✓ Supporting strategic thriving services branches that encourage high professional jobs, such as IT and ITES (also in Israel and countries where these and other branches are thriving).

Actually, from the data analysis, the State of Israelis doesn't do enough in this regard and doesn't express concern with regard to the loss of quality of human assets, which no doubt can lead to economic crisis and social instability, that means a decline in the abilities, resources and the economic productivity of the state.

The aforementioned reasons put the country's capacity to retain its most talented "minds" in jeopardy, which has an impact on the most educated populations, and Israel's ranking academically

and research-wise compared to leading countries at the world level.

**Recommendations**

Actually, a radical reorientation of the national budget's goals is necessary to reverse the tides. A large portion of Israel's working population will be more productive as a result of investments made in infrastructure and education for the country's minorities. The solutions to the academic mobility and brain drain phenomenon should suggest integrative treatment and an overall policy that includes various components such as the establishment of employment centers with appropriate wage conditions, tax benefits for academics, and self-development and professional development options.

The government should make a significant and practical move, change the way of thinking and acting, change the existing policies and legislation, and precede the practical aspects through the proposed model, which ought to be funded by the government. It is true that the implementation of the model will actually cost about 36,100,000 US $, but such a move will preserve and keep the most skilled Israeli human asset and aims to yield significant economic, social, and academic improvements and results directly at the local level and indirectly at the international level.

Although the author of the thesis used practical government and macro-finance legislation and macroeconomics to present examples of budget ad government policies in various government offices in Israel such as the report of the committee to examine the higher education system - July 2007, the national plan to "bring minds" to Israel through the establishment of centers of academic excellence - the Knesset June 2010, the Knesset's research and information center, June 6, 2010, the contact center for returning researchers - December 2014, government resolution 4434 The 31st, the establishment of an inter-ministerial committee regarding the admission of scientists and senior researchers with advanced degrees -January 2009, resolutions 803 and 1503 of the 32nd government "bringing brains" to Israel, March 14, 2010, and more but still new and updated laws, legislation and regulations are required in this context for the implementation of the suggested model and recommendations by the related bodies and ministries.

These laws are the law of the council for higher education and the student's rights act- 1958, the law of the council for higher education (amendment No. 20), 2018, the wage protection law, and the workers' protection law, alongside the inter-ministerial committee for the return of academics with advanced degrees - 2009, which aims to allow easy and safe reception for returnees and help to strengthen the chief scientist's mechanisms to accommodate the returnees.

The author recommends that all the related and responsible bodies provide a proper response for solving the discussed problem "The Israeli brain drain and academic mobility, and its influences on the Israeli labor market and the economic and academic fields", in accordance with

the proposed model. Also, each of these authorities is recommended to elect a representative, as a contact person, who is responsible for everything related to its responsibilities.

1. In light of this, the author recommends that the CHE in collaboration with universities and academic institutions, take care of the following steps:

2. Formulating, embedding, and implementing an urgent reform and upgrading of the higher education system in order to compete with parallel institutions worldwide. The essence of the reform is strengthening and improving scientific research in Israel, improving and upgrading the research infrastructures in universities and encouraging innovation and multidisciplinary, providing financial grants and scholarships to Israeli researchers, including financing equipment for research, to locate the Israeli scientists and experts and link them to the academy and research institutions, strengthen the academic staff and raise the level and elevate the standards in the universities and academic institutions, creating collaborations between the Israeli universities and academic institutions and worldwide academic institutions, improving and optimizing the supply of the Israeli universities and academic institutions and as a result also the demand for the academic institutions in Israel, which aim to make the state of Israel attractive among outstanding researchers from across the globe including Israeli researchers.

3. Operating additional study tracks in sought-after faculties such as medicine, nursing, engineering, and computer sciences and engineering.

It`s important to supply the student population, with diversified study subjects and various sought-after faculties, as mentioned above.

4. Increasing the enforcement and control measures regarding the quality of teaching services and academic methods, and keeping up with the modern and contemporary technologies adopted in developed countries, such as online and offline learning, synchronous and asynchronous learning, interdisciplinary teaching, innovative pedagogy through digital integration in teaching, research through technology and digital means, digital campuses such as model, campus IL, etc. It is important that such a process be an integral part of the teaching-learning process and that it enables continuity of the teaching-learning process in any situation or context.

5. Increasing the number of positions of experts who are responsible for handling the operated programs, Especially the establishment of "centers of excellence" (i-core) in order to strengthen scientific research in Israel, and technological improvements bias human resources - (SBTC - Skill Biased Technological Changes), in the hope of improving the research status of the State of Israel and its attractiveness among leading researchers in Israel and the world. The amount allocated for this purpose should not be less than 600-800 thousand dollars per year.

6. Formulating updated policies through a structured and comprehensive plan and

strategy related to doctoral fields and processes, which aim to minimize the gap between the number of postdoctoral students and the number of academic vacancies.

7. Designing and offering attractive and unique programs which attract Israeli and foreign students and provide a response to them, which is actually one of the main responsibilities of universities.

8. Increasing all indicators of scientific impact by increasing the number of scientific publications and increasing their level in line with parallel publications at the international level.

9. Locating Israeli researchers and academics staying abroad and linking them to academic bodies in Israel in order to return them, absorb them in Israel, and integrate them into the industry in Israel, especially the high-tech industry. The goal is to integrate them with the help of the contact center in the various research institutions in Israel, academic colleges, and research institutes.

10. In order to implement the proposed model successfully, the author recommends that the Ministry of Economics and Finance should take heavy responsibility for the following aspects:

✓ provide the budget required according to the model for at least 7-10 years, in order to ensure the model will have the necessary required budget and cover its costs.

✓ Renewing the running programs and funding new ones.

✓ Be responsible for the establishment of new international relations with core and leading countries, especially in academic and economic aspects.

✓ Be responsible for increasing the salaries of researchers, lecturers, and experts, and for the allotment of a greater quota of standards and jobs for lecturers and researchers.

✓ Providing financial advantages, facilitation, and various types of discounts to lecturers, researchers, and high qualified educated people.

✓ Be responsible for increasing the number of academic positions available for post-doctoral Moldov

✓ Be responsible for Increasing research grants and sources for funding the Israeli academic researches.

✓ Be responsible for budgeting a part of the foreign students' tuitions and all that accompanies, in order to attract foreign students to study in Israel, and be responsible for the adjustment of the student's tuition to the international tuition in parallel programs and in accordance with the reform countries in Bologna, Europe, and the OECD countries.

11. The department of Economics and Finances is recommended to act in accordance with the following principles:

1. Decreasing the tuition costs of the academic institutions.

2. Funding the establishment of sufficient and worthy students' dormitories, laboratories, lecture halls, investment in advanced technologies and required equipment, and investing in R&F and researches which bear economic and national profitability.

3. To establish additional academic institutions operated by advanced human capital infrastructures, which will enable the absorption of scientists and researchers, which will attract Israeli scientists to come back to Israel. Also, a budget should be allocated for the expansion and development of the existing institutions and enriching them by sought-after faculties and subjects.

4. Funding the Ministry of Tourism in all related to the marketing of the Israeli academy.

12. The Ministry of International Relations is recommended to be responsible for–

1. Activating and developing economic and social interests with host countries of Israeli students and "Brains", and strengthening relationships with Israeli experts while being abroad, and offering them collaborations with Israeli institutions and organizations.

2. Promoting International programs, and getting advantages from foreign students and specialists while being in Israel.

3. developing relationships and collaborations with leading and core countries.

13. The Ministry of Tourism is recommended to be responsible for –

1. Marketing the Israeli academy in other countries, providing temporary housing, and Cultural and leisure tourism for foreign students and their families while being in Israel.

2. Refreshing and upgrading "student tourism" regulations and all related to the arrival of foreign students to Israel.

14. Municipalities- are recommended to run all kinds of programs aimed at raising the awareness of high school students and parents in their jurisdiction in everything related to academia: general information, academic and admission requirements, fields of study, tuition, everything related to matriculation and psychometric tests, rights and obligations in academia and all relevant and related elements.

This will be done by building collaborations between the municipal education departments and representatives from the academy, which will be presented by joint workshops and activities integrated with students from the academy, lectures in this regard both to the students and parents, tours in the universities, distribution of brochures and leaflets that include photos and information of the Israeli universities.

Such activities and moves will be funded by the local councils, the Ministry of Education, and the Council for Higher Education alike.

15. Budgeting activities and responsibilities of the model-

Although the model, as mentioned above, is recommended to be budgeted by the government, those responsible for implementing the model on all its components have the full right to make independent decisions. The model should be composed of representatives of the aforementioned government ministries and shall be responsible for the whole program– its operation, measures of supervision and control, timetables, and allocation of the necessary resources. The model will cost tens of millions of dollars, which includes the expenses of manpower, ongoing activities, the costs of operated programs, the investment in educational institutions and the increase of the number of academic institutions, and the implementation of all the elements related to the model.

16. Regarding the Republic of Moldova, it is highly important, for the national academic community in Moldova to give increased attention and analysis to the high-skilled migration phenomenon, bringing the topic in front of the national authorities and proposing effective measures for its monitoring, management, and control. Furthermore, it`s recommended to develop an effective strategy for managing highly skilled migration, and, it will be worthy and appropriate to offer and implement the model, developed by the author which aims to deal with the Israeli brain drain, to the responsible authorities in the Republic of Moldova after making the required adjustments, for implementing, dealing with, and minimizing the dimensions of the Moldavian "brain drain" and negative effects.

Also, there is a unique need for the expansion of innovation centers that enhance student skills, which support business development, and foster community engagement through innovation and collaboration between donors, the private and public sectors, and academia, which aims to transform brain drain into brain gain. Such drastic measures aim to brighten the future for young Moldovans and ensure that Moldovan industries have a suitably trained talent pool from which to draw.

## BIBLIOGRAPHY


1. ACEMOGLU, D., AUTOR, D. *Skills, tasks and technologies: Implications for employment and earnings*. Handbook of labor economics, Vol. 4, 2011. 1043-1171 p.

2. ACEMOGLU, D., RESTREPO, P. *Secular Stagnation? The Effect of Aging on Economic Growth in the Age of Automation*, American Economic Review, 2017. 107(5): 174-79 p.

3. ADAMS, RH. *International Migration, Remittances, and the Brain Drain. A Study of 24 Labor-Exporting Countries. The World Bank Report on Poverty Reduction and Economic Management Network Poverty Reduction Group.* Policy research working paper 3069. Washington, DC: World Bank Organization, 2003.

4. ADLER, S. *Training and Retraining Programs in Israel,* Israel Ministry of Immigrant Absorption, a presentation prepared for the Metropolis Inter Conference Seminar. Tel Aviv: Aviv publication, 2002. 32-41 p. ISBN: 965-21-9651-62-1.

5. AEDO, C., HENSCHEL, J., MORENO, M., LUQUE, J. *From occupations to embedded skills: a cross-country comparison*, World Bank Policy Research Working Paper, 2013.

6. AHOLA, S., NURMI, J. *Choosing University or Vocational College – The Formation of Educational Preferences.* Stockholm: Scandinavian Journal of Educational Research, 2007. 39-47 p. disponible: https://doi.org/10.1080/0031383970410202

7. AKAN, H. *Bilimsel Yayınlarda Taraf Tutma Sağlık Bilimlerinde Süreli Yayıncılık*. 2008. 89-95 p.

8. ALTBACH, P. G. *The costs and benefits of world- class Universities*, Washington: Academe University, 2004. 20-23 p. ISBN: 978-081213-7865-6.

9. ANDERSEN, J.E., WINCOOP, E.V. *Gravity with Gravitas: A solution to the border puzzle*, American Economic Review, 2003. 93(1): 170-92 p.

10. ARIAV, T. *Planning studies towards 2020: Issues, Trends and directions,* Kfar-Saba, Israel: Beit-Berl College, 2011. 37-62 p. ISBN: 965-18-822-4124-6.

11. ARMSTRONG, M. *Brain Drain Within the EU?* Distribution of scientists and engineers in the European Union, by location, 2017. *Sep 20, 2018*

12. ARNTZ, M., GREGORY, T., ZIERAHN, U. *The Risk of Automation for Jobs in OECD Countries*, A Comparative Analysis, OECD Social, Employment and Migration Working Papers, No. 189, OECD Publishing, Paris, 2016.

13. AUTOR, D.H., DORN, D. *The growth of low-skill service jobs and the polarization of the US labor market,* American Economic Review, 103(5), 2013. 1553-97 p.

14. AUTOR, D.H., KATZ, L.F., KEARNEY, M.S. *The Polarization of the US Labor Market*, The American Economic Review, 96.2, 2006. 189-194 p.

15. AUTOR, D.H. *Why are there still so many jobs? The history and future of workplace automation,* Journal of Economic Perspectives, 29(3), 2015. 3-30 p.

16. AVVEDUTO, S. *Brain Drain and Brain Gain: The Challenges of Internalization: Introduction,* Vienna: Management of Human Resources in Higher Education, 2005. 3239 p. ISBN: 978 -93-5296- 675-9.

17. BACH, S. *International Migration of Health Workers: Labor and Social Issues,* Geneva: International Labor Office, 2003. disponible: www.ilo.org/public/english/dialogue/sector/papers/health/wp209.pdf.

18. BAIER, S., BERGSTRAND, J. *Bonus vetus OLS: A simple method for approximating international trade cost effects using the gravity equation*, Journal of International Economics 77(1), 2009.

19. BAIER S.L., BERGSTRAND, J.H. *Approximating general equilibrium impacts of trade liberalization using the gravity equation: application to NAFTA and the European Economic Area*, The Gravity Model in International Trade: advances and applications, edited by Peter A.G. van Bergeijk and Steven Brakman. Cambridge University Pres,s, USA, NY, 2010. ISBN 978- 0-521-19615-4.

20. BALDWIN, G.B. Brain Drain or Overflow, Foreign Affairs, Vol. 48, 1970. 358B372 p.

21. BANA, L. *Brain Circulation, the Phenomenon and Challenges, European Journal of Interdisciplinary Studies*. Vol.4 Nr.1, 2016.

22. BARSLUND, M., BUSSE, M. *Making the Most of EU Labor Mobility*, Report of a Centre for European Policy Studies (CEPS) Task Force, 2014.

23. BATES, A. W. *National Strategies for E-learning in Post-Secondary Education and Training,* Paris: International Institute for Educational Planning, UNESCO, 2008. 75-83 p. ISBN: 92-803-1214-6.

24. BEINE, M., DOCQUIER, F., RAPOPORT, H. *Brain Drain and Economic Growth: Theory and Evidence,* in Journal of Development Economics 64, 2001. 282-286 p. ISSN: 03043878

25. BEN-DAVID, D. *Brain Drained: A Tale of Two Countries,* CEPR Discussion Paper No. 6717, 2008.

26. BEN-DAVID, D. *"Clean Head" - the phenomenon of "brain drain" of academics from Israel,* Tel Aviv: press by the Department of Public Policy at Tel Aviv University, 2006. 189-230 p. Disponible: https://www.tau.ac.il/~danib/econ-rankings/BrainDrained.pdf.(In Hebrew)

27. BEN-DAVID, D. *Leaving the Promised Land A look at Israel's emigration challenge*, Shoresh Research Paper, May 2019.

28. BEN-DAVID, D. *Soaring Minds: The Flight of Israel's Economists*, Tel- Aviv: University of Tel – Aviv, 2009. 221 – 256 p. ISBN: 965-25-5369-08.

29. BENJAMIN, A., EDWARRD, G., LAWRENCE, S. *Saving the Heartland: Place-based policies in 21st Century America*, The Brookings Institution, 2018. disponible: https://www.brookings.edu/bpea-articles/saving-the-heartland-place-based-policies-in-21st-century-america/, accessed March 11, 2019.

30. BERGEIK, P.V. *Economic Diplomacy and the Geography of international trade*, Edward Elgar Publishing, 2009.

31. BIRAN, Y. *Israel and the European Union - 50 years of cooperation*, Jerusalem: Knesset of Israel, 62, 2009. 17-31 p. Disponible: https://main.knesset. gov.il/Activity /Info /Pages /default.aspx.

32. BRENDER, A. *Radical reform or same old subservience?* Washington: Chronicle of Higher Education, 2012. 23-47 p. disponible: https://www.chronicle.com/article/In-Japanhttps://www.chronicle.com/article/In-Japan-Radical-Reform-or/17757Radical-Reform-or/17757

33. BUSETTI, S. et al. ESPON, *The Geography of New Employment Dynamics in Europe, Applied Research, Delivery 4 – Draft Final Report*, 2017. disponible: https://www.espon.eu/employment.

34. CARRINGTON, W.J., DETRAGIACHE, E. *How extensive is the brain drain? Finance Develop*, 1999. disponible: http://www.imf.org/external/pubs/tt/tandd/1999/06/carringt.htm

35. CASTRO – COHEN, A. *Emigrating Israeli families: who goes where? Characteristics of families of Israelis who immigrated to three destinations*, Los Angeles, US: Central Bureau of Statistics – Demography and Census Department, 2013. 88-116 p. ISBN: 978-92-3100147-5.

36. CEBOTARI, M., *The impact of high skilled migration (brain drain) on republic of Moldova, an analysis of possible consequences and approaches to manage this phenomenon*, CSEI Working paper series. Issue 10, December 2018.

37. CERVANTES, M., DOMINIQUE, G. *The brain drain: old myths, new realities, OECD Observer, 2002*.

38. CHALAMWONG, Y. *The Migration of Highly Skilled Asian Workers in OECD Member Countries and Its Effects on Economic Development in East Asia*, 2004.

39. CHEIANU-ANDREI, D. Migrația cadrelor didactice din Moldova: Brain Gain sau Brain Waste? Monitor Social, Institutul pentru Dezvoltare şi Inițiative Sociale (IDIS) „Viitorul‖, Nr. 15, Chişinău, 2012

40. CHOUDADA, R., CHANG, L. *Trends in International Student Mobility*, New -York: World Education Services, 2012. 18-27 p. disponible SSRN: https:// ssrn.com /abstract =2184988.

41. CHOUDADA, R. *Social Media in International Student Recruitment*, New-York: Association of International Education Administrators Issue Brief, 2013. 76-93 p. disponible: https://www.aieaworld.org/assets/docs/OccasionalPapers/social

42. COHEN–GOLDNER, S., ECKSTEIN, Z. *Labor Mobility of Immigrants: Training, Experience, Language, and Opportunities*, N.Y: Economics Department of the University of Pennsylvania- International Economic Review 49(3), 2014. 837-872 p. disponible: SSRN: https://ssrn.com/abstract=321069.

43. COHEN, Y. *Size and selectivity patterns among Israeli born immigrants in OECD Countries*, Jerusalem: for European university institute - Robert Schuman center for advance studies, 2009. 217-222 p. disponible: DOI: 10.1177/0020715210379430.

44. COLLIER, P. *Исход: Как миграция изменяет наш мир*, Moscov: Институт Гайдара, 2016.

45. CONNEL, J., BROWN, R. *The remittances of migrant Tongan and Samoan nurses from Australia. Human Resources Health,* 2004. disponible: www.human-resources-health.com/content/2/1/2/abstract

46. CROTENCO Iu., GRIBINCEA A. Mirovaia ekonomika i migratsionnie protsesi v Moldove. // State University of Moldova. Studia universitatis. Scientific Journal. Seria „Ştiinţe exacte şi economice". 2008, №8 (13). P.215-220. (0,6 c.a.).

47. CROTENCO Iu., GRIBINCEA A. Procesele migraţionale în Moldova şi perspectivele acestora. // Republica Moldova: provocările migraţiei / Acad. de Ştiinţe a Moldovei: coord. Victor Moraru. – Ch.: Î.E.P. Ştiinţa, 2010. 148 p. P.142-145. (0,25 c.a.). Migration processes in Moldova and their perspectives. // Republic of Moldova: migration challenges / Academy of Sciences of Moldova: coord. Victor Moraru. - Ch .: Î.E.P. Science, 2010. 148 pp. P.142-145. (0.25 a.c.)./

48. CUBAN, L. *Neo-progressive visions and organizational realities*. Massachusetts: Harvard Educational Review, Vol -59, 1999. 217-233 p. ISBN : 07507-0969-3

49. CYRANOSKI, D. A. *great leap forward*, Nature, 2001. 410: 10–12 p.

50. DAGAN – BUZAGLO, N. *Right to higher education legal and budgetary perspective*, Tel Aviv: by Adva Center, 2007. 11-32 p. disponible: https://adva.org/wp-content /uploads /2014/09/Educationfull1.pdf

51. DAUGELIENE, R. *The Peculiarities of Knowledge Workers Migration in Europe and the World, in Kauno Technologists Universität's*, 2007. 57-64 p. ISSN: 1392 – 2785.

52. DAULET KHNOVA – BAZHENOVA, E. *Content Analysis of the Category "Academic Mobility of Students*", Taldykorgan City: Kazakh National University, Abaci, 2013. 483-486 p.

53. DE BRUYNE, K., MAGERMAN, G., HOVE, J.V. *Revealed Multilateral Trade Resistance in Gravity Models: A Network Approach*, ETSG conference paper, 2013.

54. DE FILIPPO, D., SANZ CASADO, E., GOMEZ, I. *Quantitative and Qualitative Approaches to the Study of Mobility and Scientific Performance: A Case Study of a Spanish University*. Research Evaluation, Vol. 18 (3), 2009. 191B200 p.

55. DE ZWAGER, N., SINTOV, R. *Driving Innovation in Circular Migration: Migration and Development in Moldova*: Market Analysis, Chişinău: Tipogr. "Elan Poligraf", 2014.

56. DOCQUIER, F., LOHEST, O., MARFOUK, J. *Brain Drain in Developing Regions (19902004)*, Bonn: IZA, Discussion Paper No. 1668, 2007. 33-41 p. disponible: https://papers. ssrn.com/soL3/papers.cfm? abstract_id=761624.

57. DOCQUIER, F., RAPOPORT, H. *Skilled Migration and Human Capital Formation in Developing Countries – A Survey*, 2004.

58. DOLADO, J. J., LALE, E., SIASSI, N. *From dual to unified employment protection: Transition and steady state,* IZA DP No. 9953, published in: Quantitative Economics, 2021, 12 (2), May 2016. 547-585 p. https://econpapers.repec.org/scripts/redir.pf?u=https%3A%2F%2Fdocs.iza.org%2Fdp9953.pdf;h =repec:iza:izadps:dp9953

59. DUSTMANN, C., GLITZl, A., FRATTINI, T. *The labor market impact of immigration*, Oxford *Review of Economic Policy*, Vol. 24 No 3, 2008. 477-494 p.

60. EDO, A. *The impact of immigration on native wages and employment, The BE Journal of Economic Analysis & Policy 15.3, 2015. 1151-1196 p.*

61. EISMAN, G. *Report for the years 2006-2012*, Jerusalem: Council for Higher Education, 2013. 32-35 p. disponible: http://lang.che.org.il/en/?page_id=8903

62. FLORIDA, R. *America's Leading Creative Class Metros*, 2012. disponible: https://www.citylab.com/life/2012/07/americas-leading-creative-class-metros/2233/#slide1, accessed March 11, 2019.

63. FLORIDA, R. *The Great Mobility Divide, City Lab*, October 12, 2017. disponible: https://www.citylab.com/life/2017/10/the-great-mobility-divide/542646/. accessed March 8, 2019.

64. FLORIDA, R. *When It Comes to Skills and Talent, Size Matters, City Lab*, July 6, 2017. disponible: https://www.citylab.com/equity/2017/07/when-it-comes-to-skills-and-talent-size-

matters/531411/, accessed March 11, 2019.

65. FRANZONI, C., SCELLATO, G., STEPHAN, P. *"Foreign-born scientists: mobility patterns for 16 countries"*. *Nat Biotech*, **2012**, 30: 1250. DOI:10.1038/nbt.2449.

66. FULLAN, M. *The meaning of educational change*, New York: Teachers College Press, 2015. 10-18, 76 p. ISBN-13: 978-0807756805.

67. GARCIA P. A. J. *Brain drain and brain waste*, Journal of Economic Development, Volume 40, issue 1, 1-34, 2015. https://econpapers.repec.org/RePEc:jed:journl:v:40:y:2015:i:1:p:1-34

68. GETS, S. *Personal Resources, Motivations to Study and Considerations of Occupational Choice in Selection of Learning Trajectories for the First Degree*, Journal USE press, 2000. 6-38 p. ISSN: 1565-1495.

69. GLITZl, A. *The labor market impact of immigration: A quasi-experiment exploiting immigrant location rules in Germany, Journal of Labor Economics 30.1, 2012. 175-213 p.*

70. GOLD, E., MOHAV, O. *The brain drains from Israel, the social and economic institute*, Tel Aviv: Israel Economic Review, Vol. 5, No. "Shalem Center", 2007. 1-22 p. SSRN: https://ssrn.com/abstract=2180400.

71. GOLOVATAIA, L., Škutovă, D., *Influența exodului de intelect asupra dezvoltării economice a statelor*. În: Relaţii Internaţionale Plus. Revistă ştiinţifico-practică Nr. 2 (12) 2017 ISSN 1857-4440. p. 112-19.https://iap.gov.md/images/publicatii/revista_ri/2_2017.pdf

72. GOOS, M., MANNING, A. *Lousy and lovely jobs: The rising polarization of work in Britain*, The review of economics and statistics 89.1, 2007. 118-133 p.

73. GREEN, M., FERGUSON, A. *Internationalization of U.S. Higher Education in a Time of Declining Resources*, Australia: Australian Government - Education International, 2011. 211-238 p. OCLC Number:767731817.

74. GURI – ROSENBLIT, S. *Trends in Access to Israeli Higher Education, 1981-1996: From Privilege to Right*, in European Journal of Education, 1997. 321-341 p. ISSN: 01418211

75. GURI – ROSENBLIT, S. *Virtual universities: Current models and future trends*, Rah nana: Open University, 2010. 487-489 p. disponible: https://doi.org/10.1080/03797720220141807.

76. **HABASHI, M.** *Complete equality between female educators and male educators in an environment dominated by male mentality*. În Revista EcoSoEn, nr 4, 2018. 147-151 p. ISSN: 2587-344X.

77. **HABASHI, M.** *Consecințele economice ale migrației forței de muncă.* În: materialele

Conferinței "Ştiinţă, educaţie, cultură", nr. 1, Comrat, Moldova, 15 februarie 2020. 41-46 p. ISBN: 978-9975-83-092-8.

78. **HABASHI, M.** *Correlation between professional performances and cross-border migration: conceptual discussions*. În: materialele Conferinței "Dezvoltarea economico-socială durabilă a euroregiunilor şi a zonelor transfrontaliere", v.35, Iași, România, 25 octombrie 2019. 227-233 p. ISBN: 978-606-685-687-4.

79. **HABASHI, M**. *Cross-border migration of human resources.* În: materialele Conferinței "Dezvoltarea economico-socială durabilă a euroregiunilor şi a zonelor transfrontaliere", v.33, Iași, România, 9 noiembrie 2018, 276-285 p. ISBN: 978-606-685-616-4

80. **HABASHI, M**. *Cross-border migration of human resources.*In: Carmel college web-site, Israel, February, 2022. http://www.mcd.org.il/.http://mcd.org.il/site/wp-content/uploads/2022/02/cross-border-migration-MANAL-H.pdf

81. **HABASHI, M.** *Cross-border vision on the labor market*. În: materialele Conferinței "Dezvoltarea economico-socială durabilă a euroregiunilor şi a zonelor transfrontaliere", nr.35, Iași, România, 25 octombrie 2019. 220-225 p. ISBN: 978-606-685-687-4

**HABASHI, M.** *Cross-border vision on the labor market*. In: Carmel college web-site, Israel, February, 2022 http://www.mcd.org.il/.

http://mcd.org.il/site/wp-content/uploads/2022/02/Cross-border-vision-MANAL-H.pdf

82. **HABASHI, M.,** GRIBINCEA, A., CARABEȚ, M., COJOCARU, V**.** *Economia Cunoasetrii Şi Exodul Creieril Iaşi*, 2019. 183-187 p. ISBN: 978-606-13-4996-8

83. **HABASHI, M.** *Education administration - the basis of the country's competitiveness*, All Arab newspaper site, 2021. disponible: https://www.alarab.com/Article/990961.

84. **HABASHI, M.,** COJOCARU, V., GRIBINCEA, A**.** *Education management - the basis of the country's competitiveness.* În revista EcoSoEn, nr. 1-2, 2020. 7-13 p. ISSN 2587-344X. ISSN:2587-344X.

85. **HABASHI, M.** *Gradul de corelare dintre migraţie şi dezvoltarea economică.* În: materialele Conferinței "Ştiinţă, educaţie, cultură", nr. 1, Comrat, Moldova, 15 februarie 2020. 32-38 p. ISBN: 978-9975-83-090-4 (IN ROMANIAN)

86. **HABASHI, M.** *How does the state of Israel try to deal and coop with the phenomenon of brain drain and academic mobility?* In: Carmel college web-site, Israel, March, 7, 2022 http://www.mcd.org.il/; http://mcd.org.il/site/wp-content/uploads/2022/03/FINAL-__Article-3-Manal-A.H.-How-does-the-State-of-Israel-try-to-deal-and-coop-with-the-phenomenon-of-brain-drain.pdf

87. **HABASHI, M.** *Immigration From Israel: a Problem or an Opportunity*. In: Application

participant in the international scientific and practical conference "Actual questions of economic science in the XXI century ", October 15, 2020. UDC 37.07, 338.24. ISBN

**HABASHI, M.** *Immigration From Israel: a Problem or an Opportunity*. In: Carmel college web-site, Israel, February, 2022. http://www.mcd.org.il/.

http://mcd.org.il/site/wp-content/uploads/2022/03/IMMIGRATION-FROM-ISRAEL-A-PROBLEM-OR-AN-OPPORTUNITY.pdf

88. **HABASHI, M.** *Impactul exodului creierilor asupra economiilor țărilor.* În: materialele Conferinței "Проблемы и вызовы экономики региона в условиях глобализации", nr. 4, Comrat, Moldova, 19 decembrie 2018, 99-111 p. ISBN:978-9975-83084-3.

89. **HABASHI, M.** *Israel-Asia Relations: Balancing Economic and National Security*. In materials of VI International round table on the topic: «Science and Innovation: Domestic and World Experience». Institute of international relations of Moldova (IRIM), Chisinau, Moldova, May 13, 2020. 31-54 p. UDK: 001.891.+378.14

90. **HABASHI, M.** *Knowledge in the service of mankind*. În: materialele Conferinței "World economy and international economic relations", nr.3, 2020, Chişinău, Moldova, 1 ianuarie 2020. 94-99 p. ISBN: 978-611-01-1615-2

91. **GOLOVATAIA, L., HABASHI, M.** Migration of intellectuals in the context of the modern world economic system. Scientific-practical Journal International Relations Plus, No. 1 (21) 2022. Chisinau, Moldova. ISSN 1857-4440, eISSN 2587-3393, Tipe B.https://doi.org/10.52327/1857-4440. Pp. 127-133 (in english)

92. **ГОЛОВАТАЯ, Л., ХАБАШИ М.** Миграция интеллектуалов в контексте современной мировой экономической системы. Revistă ştiinţifico-practică Relaţii Internaţionale Plus Nr. 1 (21) 2022. Chişinău, Moldova. ISSN 1857-4440, eISSN 2587-3393, Tipul B.https://doi.org/10.52327/1857-4440. Стр.48-54 (in russian)

93. **HABASHI, M.** *si al. Model of economic development on the way to overcome unemployment and labor force growth* . In: Journal of Advanced Research in Law and Economics, 9(6), 2018. стр. 2060–2071 p. (indexat Scopus). ISSN: 2068-696X. disponible: https://doi.org/10.14505//jarle.v9.6(36).21

94. **HABASHI, M.** *Problema economică globală: sărăcirea factorilor de producție*. NIER, International Conference on Theoretical and Applied Economic Practices: Economic growth in conditions of globalizytion: welfare and social inclusion, v.1, the 14th Edition, October 10-11, 2019, Chisinau. 133-138 p. ISBN: 978-9975-3305-6-5.

95. **HABASHI, M.,** GRIBINCEA, A**.** *Promovarea valorilor epocii cunoştinţelor: de la teorie la practică*. In revista Administrarea Publică, nr.3(103), 2019. 104-110 p. ISSN 1813-8489. ISSN:

1813-8489.

96. **HABASHI, M.** Provocări și modalități de gestionare a educației (academice) migraționale și mobilitatea academică în Israel. Administrarea Publică Revistă metodico- ştiinţifică trimestrială Nr. 3 (115) iulie - septembrie 2022, Chișinău, p. 83-97. ISSN 1813-8489, Tipul B. https://doi.org/10.52327/1813-8489

97. **AMOUN-HABASHI M**. Problems and ways of managing educational (academic) migration and academic mobility in Israel. Revistă metodico-ştiinţică trimestrială "Administrarea Publică" Nr. 3 (115), iulie - septembrie 2022. Chișinău, 2022.ISSN 1813-8489, Tipul B. https://doi.org/10.52327/1813-8489. Pp.83-99 ((in russian).

98. **HABASHI, M., COJOCARU, V., LAZARIM, S.** *Reglementarea Economica Şi Politica De Migratie In Zona Uniunii Europene*, În: Conferinţa ştiinţifico-practică internaţională, dedicată aniversării de 30 ani de la fondarea Universităţii de Stat din Comrat 11 februarie 2021. 47-52 p. ISBN: 978-9975-3496-1-1. (IN ROMANIAN)

99. **HABASHI, M.** The causes of the Israeli brain drain. In: Școala doctorală a Academiei de Administrare Publică, Chișinău: AAP, 2022. Materiale ale Conferinţei ştiinţifico-practice internaționale, a studenților, doctoranzi, ediția I, noiembrie 19, 2021. 13-17 p. ISBN 978-9975-3418-2-0 (PDF).

https://aap.gov.md/files/conferinte/19.11.21/19.11.21.pdf

100. **HABASHI, M.** *The Israeli brain drain and it`s causes*. In: Carmel college web-site, Israel, March, 7, 2022. http://www.mcd.org.il/

http://mcd.org.il/site/wp-content/uploads/2022/03/FINAL-Article-2-Habashi-Manal-The-causes-of-the-Israeli-brain-drain.pdf

101. **HABASHI, M.** *The Israeli brain drain and academic mobility of higher education students- The existing situation.* In**:**

102. **HABASHI, M.** *Training qualified specialists of Israel labor market*. În: materialele Conferinței "World economy and international economic relations", nr.3, Chișinău, Moldova, 1 ianuarie, 2020. 61-66 p. ISBN: 978-611-01-1615-2

103. HAG-YAHYA, K., ARAR, H. *In the speech on Higher Education: Studies on the Mobility of Arab Students from Israel abroad, Al-Ayyam Publishing*, Ramallah, February 2014.

104. HAIRONG, W. *Bringing About Brain Gain. China*: lure talent from overseas, 2011. 112-119 p. disponible: https://medium.com/@HarvardAsh/from-brain-drain-to-brainhttps://medium.com/@HarvardAsh/from-brain-drain-to-brain-gain-39d54722101fgain-39d54722101f

105. HALL, P. Brain drains and brain gains: Causes, consequences, policy. International Journal

of Social Economics 32 © November, 2005. 939-950 p. DOI:10.1108/03068290510623780

106. HAROLD, C., ARIAN, L. *Market entry and economic diplomacy, Applied Economics Letters*, 20:5, 2013. 504-507 p.

107. HAUPT, A., JANEBA, E. *Education, Redistribution, and the Threat of Brain Drain, in International Tax and Public Finance*, 2009. 31-41 p. ISSN: 0927-5940.

108. HAVA KLEIN, A., MICHAL, O., YELENA, K. *Planning and Policy Division*, the planning and budgeting committee, Council for Higher Education, May 2014. 1-75 p.

109. HERSHKOVITS, S., FORKUSH, A. *A case study of Israeli higher-education institutes sharing scholarly information with the community via social networks*, N.Y: Elsevier for Higher Education, 2011. 58-68 p. disponible: https://doi.org/10.1016/j.iheduc2011.08.003.

110. IAN S, L. Israel's *Migration Balance Demography, Politics, and Ideology*. Israel Studies Review, Berghahn Books, Vol. 26, No. 1 (Summer 2011), pp. 33-65 pp. https://www.jstor.org/stable/41804745

111. JALLADE, J. *Access to Higher Education in Europe: Problems and Perspectives*, in Conference on Access to Higher Education in Europe, Paris, 1992. 25-32 p. ISSN: 00181560, ISSN: 1573174X.

112. JESUS, S. *Brain drain / brain gain (with a focus on Spain*), Biofisica #5 Magazine, ICMol, Valencia Spain, May-Aug 2016. 1-5 p. http://biofisica.info/

113. KESSELMAN, L., SOMECH, J. *The Hebrew University of Jerusalem - Annual Reports* 2014-2015, Tel Aviv – Israel: KPMG Publishers, 2016. 32-36 p.

disponible : https: //che. org.il/wp-content/uploads/2016/11/%D7%AA%D7%9C.

114. KHADRIA, B. *Skilled Labor Migration from Developing Countries*, Study in India, 2002.

115. KIM, T., LOCKE, W. *Transnational academic mobility and the academic profession*. *London – UK: The Open University, Centre for Higher Education Research and Information*, 2010. 25-34 p. disponible : http://oro.open.ac.uk/21282/

116. KING, R. S. *The Global Brain Trade, a survey reveals the worldwide migration patterns of researchers,* Oklahoma City: Oklahoma University, 2012. 73 p. ISBN 978-92-7981480-8.

117. KNIGHT, M. *Strategic review of the student visa program in Australian Government*, Sydney Australia: Australia Government, 2016. 11-19 p. disponible: https://www.homeaffairs.gov.au/reports-and-pubs/files/2011-knight-review.pdf

118. KOST, F., GABAI, Y. *Ben – Gurion University - Annual Reports 2014-2015*, Tel Aviv – Israel: EY- Publishers, 2016. 2-22 p. disponible: https://che.org.il/wp-content/uploads/2016/11/%D7%91%D7%9F .

119. KOST, F., GABAI, Y. *Haifa University - Annual Reports 2014-2015*, Tel Aviv: EY-Publishers, 2016. 26-32 p. disponible: https://che.org.il/wp- content/uploads/2016/11 /%D7%97%D7%99%D7%A4%D7%94 .

120. KUPFER, L., HOFMAN, K., JARAWAN, R., McDERMOTT, J., BRIDBORD, K. *Roundtable, Strategies to discourage brain drain*, Bull World Health Organ ;2014. 82: 616–19 p.; discussion 619–23 p.

121. LEVI, E. *Knesset Research and Information Center, Description and Analysis of the Higher Education Budget in Recent Years*, October 2013.

122. LEVY, L. F. *The first world's role in the third world brain drain*, July 2003. *BMJ*; 327:170. Doi: https://doi.org/10.1136/bmj.327.7407.170

123. LEVY, P. *The absence of tools for planning medical personnel in Israel*, Jerusalem, Israel: "Knesset Israel" - Report and Information Center, 2010. 3-22 p. disponible: https://fs.knesset.gov.il/globaldocs/MMM/20ef6d8d-f1f7-e411-80c8-00155d01107c/2_20ef6d8d-f1f7-e411-80c8-00155d01107c_11_7127.pdf.

124. LONDON, G., SAMAFF, S. *Managing human resources*, units 8-10, New Edition. Rahanana: Bar-Haim publish books, 2016. 13-24 p. ISBN: 978-965-06-1480-5.

125. MAOZ, L. *International Higher Education - International Students in Israel - Proposal for Policy Principles*, Tel Aviv: Council for Higher Education, 2015. 5 – 37 p. disponible: https://fs.knesset.gov.il/globaldocs/MMM/2cc18d55-f7f7-e411-80c8-0155d010977/2_

126. MARTIN, RD., TEROUANNE, D., NEHER, E. *Higher Education in France and The International Migration of Scientists,* Washington, DC: Centre National de la Recherché Scientifique, 1998.

127. MEEK, L. V., GOEDGEBUURE, L.C. *Change in higher education: The Australian case, in the Australian Educational Researcher*,16, 2002. 1-22 p. ISSN: 0311-6999.

128. MENIN, A. *The impact of globalization on the brain hunting and the brain drain,* (case study – Israel). In Social Economic Debates, vol. 6, 2018. 11-18 p. ISSN 23601973; ISSN – L 2248 – 3837

129. MEYER, J.B., BROWN, M. *Scientific diasporas: a new approach to the brain drain, Management of Social Transformations,* Discussion paper No. 41. Paris: UNESCO, 1999.

130. MEYER, J.B., KAPLAN, D., CHARUM, J. *Scientific Nomadism and the New Geopolitics of Knowledge.* International Social Science Journal, Vol. 53, 2001. 309-321 p.

131. MORRISON, C., MURRTIN, F. *The Kuznets Curve of Education: A Global Perspective on Education Inequalities*, London: Centre for the Economics of Education, London School of Economics, 2010. 777- 780 p. ISSN: 2045-6557.

132. MOUNTFORD, A. *Can a Brain Drain Be Good for Growth in the Source Country?* In Journal of Development Economics 53, 1997. 287-303 p. disponible: https:// doi.org /10. 1016/S0304-3878(97)00021-7

133. NEMIRI TAICI, F., GOLOVATAYA, L. Interconexiunea dintre piața muncii şi migrația internațională. Cazul Algeriei. IRIM, Revistă științifico-practică Relații Internaționale Plus, Nr.1 (13) 2018. ISSN 1857-4440; eISSN 2587-3393. Chisinau, 2018. Pp.165-178/ The interconnection between the labor market and international migration. The case of Algeria. IRIM, Scientific-Practical Journal of International Relations Plus, No.1 (13) 2018. ISSN 1857-4440; eISSN 2587-3393. Chisinau, 2018.

134. ÖZDEMIR, O.R. *Medikal İstatistik, In: Özdemir O, editor*. Baskı İstanbul: İstanbul Medikal Yayıncılık, 2006. 20 p. ISBN: 9756395478

135. PANG, T., LANSANG, MA., HAINES, A. *Brain drain and health professionals*, 2002. *BMJ* ;324: 499–500 p.

136. PERELMAN, J.L. *School's out – Hyper learning, The New Technology and Education*, New York, USA: William Morrow and Company, 2002. 66-72 p. ISBN-13: 9780688112868.

137. RATHA, D. *Workers' remittances: an important and stable source of external development. In: Striving for Stability in Development Finance,* Washington (DC): World Bank, 2003. 157–175 p.

138. RAVITCH, D. *Left Back: A Century of failed school reform,* New York: Simon and Schuster press, 2010. 63-81 p. ISBN: 978-0-684-84417-6.

139. REQUENA, J. Economy crisis: Venezuela`s brain drain is accelerating. August, 2016

140. RESNICK, J. *International organizations, the "Education – Economic Growth" Black box, and the development of world education culture,* Chicago: Comparative Education Review, Vol 50, 2005. 173-195 p. disponible: https://doi.org/10.1086/500692.

141. RON, T. *The brain drains and mobilizing minds in the world and in Israel*, Jerusalem: Israeli Knesset - Research and Information Department, 2014. 4-49 p. disponible: https://www.academy.ac.il/SystemFiles2015/Knesset%20Committee%20on%20Returning%20 Academics%20English%202014.pdf

142. SAMEK LODOVICI, M. *The Geography of New Employment Dynamics in Europe: Key Findings and Policy Suggestions, presentation at the ESPON Seminar 'Territorial Cohesion Post 2020: Integrated Territorial Development for Better Policies'*, Sofia, Bulgaria, 2018.

143. SANGREN, S.P. *Rhetoric and Authority of Ethnography postmodernism and the social reproduction texts,* Chicago: Chicago press, Vol- 29, 2008. 410-415 p. ISSN: 00113204.

144. SARASON, S. *The Predictable failure of Educational Reform,* San Francisco: "Jossey Bass" press, 2009. 51-63 p. ISBN: 1-55542-269-1.

145. SCHEININ, S., HERZOG, V. *Strengthening of higher education through students from other countries,* Hertzeliya: "Economic Models" - for Hertzeliya Conference, 2009. 3-71 p. disponible: https://www.idc.ac.il/he/research/ips/documents/2010/%D7%A0%D7%99%D7%99%D7%A8%D7%95%D7%AA/economicdevelopment_israeliarab2010.pdf

146. SCHOMBURG, H., TEICHLER, U. *Higher Education and Graduate Employment in Europe: Results from Graduates Surveys from Twelve Countries*, Dordrecht: Higher Education Dynamics press, 2006. issue – 15, 28-45 p. ISBN 978-1-4020-5154-8.

147. SCUTIN, S. D. *Reforming higher education from within: Lessons learned from other mature sectors of the economy,* Hertzeliya: Israeli Knesset, 2016. 13 p. ISSN: 0738-0593.

148. SEMCHUK, L. *Ukraine: why brain drain is a national crisis and how new president can halt it?* May, 2019.

149. SESSLER, D. IMREY, PB. *Clinical Research Methodology 3: Randomized Controlled Trials*. Anesth Analg, 2015. 121:1052–64 p. disponible: http_://dx. DOI. org/ 10.1213/ ANE. 000000000 0000862.

150. SHEMES, A., ROTEM, N., HALKALAI, Z. *Occupational characteristics of physicians in Israel- 34 doctors residing abroad, Health Policy Branch,* Jerusalem, Israel: Press by the Ministry of Health, 2017. 6-28 p. Available at: doi.org/10.1186/s13584-017-0157-0.

151. SOMECH, Y., CHAIKIN, V. *Technion Institute, annual reports from 2014 - 2015,* Tel Aviv: KPMG PRESS, 2016. 22-24 p. disponible: https://web.iem.technion.ac.il /he/ statistics-laboratory/reports-and-publications.html.

152. OMECH, Y., CHAIKIN, V. *Tel Aviv University, annual reports from 2015 - 2016* Tel Aviv: KPMG PRESS, 2017. 15-22 p. disponible: https://en-humanities. tau.ac.il /sites/humanities_en.tau. ac.il/files/Minerva%20Annual%202015-2016 %20 Web. Pdf

153. STALKER, P. *International migration,* Moscow: Book Club bibliologist, 2015.

154. STREITWIESER, B. *Internationalization of Higher Education and Global Mobility Oxford Studies in Comparative Education,* Oxford: Symposium Books, 2014. 312-334 p. ISBN: 978-873927-42-7.

155. SUBBOTIN, A., AREF, S. *Brain drain and brain gain in Russia: analyzing international mobility of researchers by discipline using Scopus bibliometric data 1996-2020*. MPIDR Working Paper WP, l May 2020 Revised December 2020. disponible: https://doi.org/10.4054/MPIDR-WP-2020-025

156. SUDEEP, L., ANIP, SH. *Global student mobility trends- 2021 and beyond, L.E.K*

*Insights*, June, 2021. disponible: https://www.lek.com/insights/ar/global-student-mobility-trends-2021-and-beyond

157. SULS, R. *"Educational divide in vote preferences on track to be wider than in recent elections",* Pew Research Center, 2016. 1-6 p. disponible: http://www.pewresearch.org/fact-tank/2016/09/15/educational-divide-in-vote-preferences-on-track-to-be-wider-than-in-recent-elections/, accessed March 11, 2019.

158. SVIRSKY, S., KONOR – ATIAS, E. *The social situation in 2016,* Tel Aviv: Central Bureau of Statistics (CBS), 2017. 139-152 p. disponible: http://adva.org/wp-content/uploads/2017/03/SocialReport2016.pdf.

159. TEICHLER, U. *Careers of University Graduates: Views and Experiences in Comparative Perspectives.* Dordrecht: springer- (Higher Education Dynamics – 17), 2007th edition. 1-288 p. ISBN: 13978-1-4020-5926-1.

160. TESCHNER, N. *The brain drains and mobilizing minds in the world and in Israel*, Jerusalem: The Knesset – Research, 2014. 21-44; 125-171 p. disponible: https://m.knesset.gov.il/EN/activity/mmm/me03375.pdf

161. TIMOTHY, P.C. *Alienated America: Why Some Places Thrive While Others Collapse*, New York: Harper Collins, 2019. 1-349 p.

162. TROW, M. *From Mass Higher Education to Universal Access: The American Advantage. Research and Occasional Paper Series*. UC Berkeley: Higher Education press, 2000. 24-61 p. disponible :https://cshe.berkeley.edu/sites/default/files/publications /pp.trow.masshe.1.00.pdf

163. VAN NOORDEN, R. *"Global mobility: Science on the move"*. *Nature* 490, **2012**. 326-329 p. DOI: 10.1038/490326a.

164. VRAA – JENSON, J. *Making Bologna a Reality. Mobility of Staff and Students. Bologna Process through Third Country Training*. Copenhagen: The International Official Seminar, 2007. 8-9 p. DENMARK

165. WASCHUK, A., KAMENETSKYY, A. *How Ukraine can go from brain drain to brain gain. August*, 2020.

166. WOLINSKY, A. *Academy in Changing Environment: higher education policy in Israel in 2004 – 2010* Tel Aviv: KOTAR Press, 2011. 63-94 p. ISBN: 965-02-0280-3.

167. YEMINI, M. *Implementation of the Bologna process in higher education in Israel*, Jerusalem: Taub Center, 2014. 3-9 p. disponible: http://taubcenter.org.il/wphttp://taubcenter.org.il/wp-content/files_mf/h2014.01internationalizationofeducation.pdfcontent/files_mf/h2014.01intern

ationalizationofeducation.pdf

168. ZERED, E. *Israelis with Academic Education Abroad and Steps Taken to Return Them to Israel*, June 2020. 1-34 p.

169. ZUSMAN, N. et – al. *Differences in the quality of education between universities, colleges: test using the proceeds in the labor market,* Tel Aviv: Samuel Neaman Institute, 2007. 122-139 p. disponible: https://www.neaman.org.il /Files/higheco.pdf Web sites with.

**SOURCES OF STATISTICAL DATA, REPORTS AND WEBSITES**

170. ARWU, *Academic Ranking of World Universities*, 2007.

171. *Bank of Israel, Data and Statistics, the State of Israel web-site*. ©2018 [Date of visit: 6.7.2019]. disponible: https://www.boi.org.il/he/DataAndStatistics/Pages/Default.aspx.

172. BFUG (Bologna Follow-Up Group). *The European Higher Education Area (EHEA) In a Global Context*, Madrid: Report on overall developments at the European, national and institutional levels, 2010. 38-101 p. Disponible: http://ehea.info/cid103973/bfug-meeting-20.html .

173. BOLOGNA DECLARATION. *Joint declaration of the European Ministers of Education Retrieved*, Italy: Bologna Declaration, Vol - 92-6, 1999. 3-7 p. ISBN: 978-3-319-77407-7.

174. *Bologna Work Programmed Lifelong Learning Website 2007-2010*. The official Bologna Process ©2016 [Date of visit: 3.1.2019]. disponible: https://onderwijs.vlaanderen.be/personeel-universiteiten

175. *Bologna Work programmed Mobility*. The official Bologna processes. ©2010 [Date of visit: 14.11.2019] disponible: https://onderwijs.vlaanderen.be/personeel-universiteiten

176. *Brain Drain across the Globe*. Country Case Studies, Mario Alberto Aráuz Torres, Urszula Wittchen. ©2017[ Date of visit: 2.8.2019]. disponible: http://freedownloadb. com/doc/ analysis-of-global-trends-in-brain- drain-b-and-gain-6606697.html .

177. Bureau of Statistics of Moldova - http://www.statistica.md/ [visited on 10.10.2018]

178. *Calacalist web-site*, the publication of newspapers regarding the treatment of doctors who leave Israel. ©2017 [Date of visit: 19.5.2019]. disponible: https://www.calcalist .co.il/ home /0,7340,L-8,00.html

179. Central Bureau of Statistics of Israel- *CBS web*-site, ©2019. 1-41 p. https://www.cbs.gov.il/he/publications/doclib/2019/9.shnatonlabourmarket/st_eng09.pdf [Date of visit: 26.11.2019].

180. Central Bureau of Statistics of Israel- *CBS web*-site, Students at institutions of higher

education (2007/8-2018/19), ©2020. https://www.cbs.gov.il/en/publications/Pages/2019/Students-Institutions-of-Higher-Education-2007-2019.aspx [Date of visit: 26.5.2021].

181. *Council for higher education in Israel* – Knesset Web site of CHE© 2018. DIRECTORATE FOR EMPLOYMENT, LABOUR AND SOCIAL AFFAIRS EMPLOYMENT, LABOUR AND SOCIAL AFFAIRS COMMITTEE. OECD SOCIAL, EMPLOYMENT AND MIGRATION WORKING PAPERS No. 239. A Global Profile of Emigrants to OECD Countries: Younger and More Skilled Migrants from More Diverse Countries, February 2020. 1-40 p. [Date of visit: 8.10.2021]. disponible: http://www.oecd.org/els/workingpapers

182. Database on Immigrants in OECD Countries (DIOC) 2015/16 and World Bank. 2020. 1-40 p. [Date of visit: 8.10.2021]. disponible: http://www.oecd.org/els/workingpapers

183. *ECONOMIC INNOVATION GROUP*. The New Map of Economic Growth and Recovery, 2016. disponible: https://eig.org/recoverymap#mapReport, accessed March 8, 2019.

184. *Education at a Glance 2016* – OECD© Indicators-2016 in: OECD website ©2016. 1-510 p. [Date of visit: 1.12.2019].disponible: https://www.oecd-ilibrary.org/education/education-at-a-glance-2016_eag-2016-en

185. *Education mirror statistics - 2005-2015 In Israel's Central Bureau of Statistics*. Tel Aviv: The CBS Press, 2016. 21-24 p. disponible : https://www.cbs.gov.il/he/pages/default.aspx

186. *Erasmus© plus European Mission* – wallpapers site, ©2012. [Date of visit: 4.2.2019]. disponible: http://europa.eu/rapid/press-release_IP-14-1025_en.htm

187. Erasmus + programme of the European Union. © 2022. [Date of visit; 14.2.2020]. disponible: https://www.erasmusplus.org.il/israeli-projects-results

188. *ESU -The European Students Union, Bologna at the finish line: An account of ten years of European higher education reform,* Brussels, Belgium, 2010. 15-96 p. ERIC Number: ED539510. disponible: https://files.eric.ed.gov/fulltext/ED539510.pdf

189. *European Association of Institutions in Higher Education web-site*. © 2017 [date of visit: 7.2.2019]. disponible: https://www.eurashe.eu/

190. *European Bank* – web-site of the data- bank. © 2017[Date of visit: 2.8.2019] disponible: https://www.ecb.europa.eu/home/html/index.en.html

191. *European Commission. The ingredients for building a world-class university*, Belgrade: CORDIS News, 2004. 32-39 p. ISBN: 978-94-6209-034-7.

192. *European University Association* – Data Information. © 2017 [Date of visit: 9.11.2020]. disponible: https: //eua.eu/

193. EUROSTAT, Statista, *brain drain within the EU- Distribution of scientists and engineers in the European Union, by locality*, 2017. *https://www.statista.com/chart/15528/eu-scientists-by-location/* [Date of visit: 30.4.2022]

194. *Globes – Israeli Economic News paper* - The departure of professionals from the courts and lawyers. ©2017[Date of visit: 1.12.2019]. disponible: http://www.globes.co.il /news/article.aspx ? did

195. Government Decision no. 655 of 08.09.2011on the approval of the National Strategy on Migration and Asylum (2011-2020)Published on: 16.09.2011 în Monitorul Oficial Nr. 152-155.

196. Government Decision no.339 dated May 20, 2014, Action Plan for 2014-2016 to support the reintegration of the citizens returned from abroad,Published: 30.05.2014 in the Official Gazette No. 134 –141.

197. Government Decision no. 200 of 26.02.2016, National Plan Diaspora 2025, retrieved from: https://brd.gov.md/sites/default/files/sn_diaspora_2025_web.pdf

198. Government Decision no.724 from September 8, 2017, Action Plan for 2017-2020 on (re)integration of Moldovan citizens returning from abroad,published on:15.09.2017 in Monitorul Oficial Nr. 335-339.

199. *"Haarets" – Economic Journal* - The presence of the Israeli students. ©2017 [Date of visit: 16.7.2019]. disponible: https://www.haaretz.co.il/

200. *HESA, Resources of Higher Education Institutions 2007/08*, Cheltenham, UK: Higher Education Statistics Agency, 2009. disponible : https://www.hesa.ac.uk/collection /c07051 /n/styloid

201. *Higher Education Council (HEC): Web – site* ©2013 [Date of visit: 26.8.2018]. disponible: https://www.hec.gov.rw/index.php?id=4

202. *Higher Education Council: web-site.* ©2016 - 2019 [Date of visit: 6.10.2019].

203. *Higher Education in Australian Government*- Data web-site. ©2017 [Date of visit: 22.8.2019]. disponible: http://www.australia.gov.au/information-and-services/educationhttp://www.australia.gov.au/information-and-services/education-and-training/ higher-educationand-training/higher-education.

204. *Higher Education in Germany*- Data- web-site. © 2017 [Date of visit: 4.6.2019]. disponible: https://www.hrk.de/activities/higher-education-%20system/

205. *Information about economic and social data* - Investment in higher education- web site/ © 2018 [Date of visit: 10.12.2019]. disponible: https://www.cia. gov/library /publications /the-world-factbook/

206. *Information about the brain- drain from Israel*. © 2017 [Date of visit: 2.11.2019].

disponible: http://www.brainreturn.org.il/web/8888/nsf/sbs.p.

207. Institute of International Education- *IIE web-site.* American statistics data of Academic mobility all over the world. ©2019 [Date of visit - 12.2.2020]. disponible: http://www.iie.org/Research-andhttp://www.iie.org/Research-and-Publications/Open-DoorsPublications/Open-Doors

208. *International Association of Universities (IAU) web-site*. ©2020 [Date of visit: 8.3.2019]. disponible: https://www.iau-aiu.net/

209. International Labor Organization (2020), Evaluarea prestării serviciilor de ocupare pentru tineri de către Agenţia Naţională pentru Ocuparea Forţei de Muncă, retrieved from: http://anofm.md/page/rapoarte1

210. IOM- UN MIGRATION REPORT, World migration report, 2020.

211. Labour Migration: Profile and current challenges of Moldovan migrant workers in main destination countries, 2020, p.23. https://moldova.iom.int/sites/g/files/tmzbdl1626/files/documents/Migratia%20in%20scop%20de%20munca_5.pdf

212. Ministry of Aliya and Integration, Assistance for Employing Returning - Resident Scientists, July, 2021. https://www.gov.il/en/departments/general/financial_help_returning

213. Ministry of Health of Republic of Moldova (2013), National Center for Health Management, Destinații prioritare pentru recunoașterea diplomelor medicale eliberate de instituțiile de învățământ medical din Republica Moldova, retrieved from:https://brd.gov.md/sites/default/files/document/attachments/studiu_destinatii_prioritare_pt_recunoasterea_diplomelor_medicale_in_republica_moldova_2013.pdf

214. Ministry of Internal Affairs of the Republic of Moldova Bureau of Migration and Asylum (2016), The Extended Migration Profile of Republic of Moldova 2010-2015, retrieved from: https://mai.gov.md/sites/default/files/document/attachments/raport-analitic-pme_2010-2015_ed._2016.pdf

215. Ministry of Internal Affairs of the Republic of Moldova, Bureau of Migration and Asylum (2016), The Extended Migration Profile of Republic of Moldova 2010-2015, retrieved from: https://mai.gov.md/sites/default/files/document/attachments/raportanalitic-pme_2010-2015_ed._2016.pd

216. OECD, AFD, *Migration Data Brief*, The new immigrants' Global trends in migration towards OECD countries between 2000/01 and 2015/16, N°4 June 2019. www.oecd.org/migration.

217. *OECD. Education at a glance 2010: OECD indicators*. Paris: Policy Workshop on

Institutional Approaches to Policy Coherence for Development, 2010. 4-16 p. ISBN: 97892-64-07566-5.

218. *OECD. PIAAC Problem Solving in Technology-Rich Environments: A Conceptual Framework*, 2018.

219. *OECD. Skills Outlook* 2016: *First Results from the Survey of Adult Skills*, OECD Publishing, 2016.

220. *PIAAC Expert Group in Problem Solving in Technology-Rich Environments*. OECD Education Working Papers, No. 36, OECD Publishing, 2017.

221. Profilul Migrațional Extins al Republicii Moldova 2010-2015, https://moldova.iom.int/resources/extended-migration-profile-republic-moldova-2010-2015

222. *RUSSKIY MIR FOUNDATION, Information about Brain Drain from Russia*. "Russkiymir" web-site. © 2018 [Date of visit: 2.2.2021]. disponible: https://www.russkiymir.ru/en/

223. *Shochat Committee in 2007* - a committee discussing the reform of higher education. © 2017 [Date of visit: 25.6.2020]. disponible: https://che.org.il/wp-content/uploads-2007. pdf

224. *Tekhnion Institute*- The web site of international programs at the Tekhnion. ©2017 [Date of visit: 6.12.2019]. disponible: http://int.technion.ac.il/partnership-and-exchange.

225. The Global Economy.com- Business and economic data for 200 countries. https://www.theglobaleconomy.com/Moldova/human_flight_brain_drain_index/

226. *The international programs` web-site*, Tel Aviv University. ©2019 [Date of visit: 7.2.2020] disponible: https://international.tau.ac.il/ .

227. *The Israeli Council for Higher Education*, The Higher Education System in Israel, 2015.

228. *The Israeli innovation authority's website*. The plan restitution of Academics. ©2018[Date of visit: 3.10.2019]. disponible: https://www.israel-braingain.org.il /article. Aspx?id=7120

229. *The World Bank*, August, 2021.

230. *The world bank* – the brain drains. ©2019 [Date of visit: 16.9.2020]. disponible: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/657051570692065211/world-bank-eca-economic-update-fall-2019

231. *UCEA.* Recruitment and Retention of Staff in Higher Education, London: Universities and Colleges Employers Association, 2008. 77-93 p. disponible: https://www.Universitysuk.ac.uk/policy-and-analysis/reports/Documents/2008/recruitment-and-retention-of-staff -in-he2008.pdf

232. *UNESCO*, Institute for Statistics, Data for the Sustainable Development Goals. ©2020.

[Date of visit: 16.6.2021]. disponible: http://uis.unesco.org/en/blog/brain-drain-gain-benefits-arising-international-knowledge-networks

233. *UNESCO*, Institute for Statistics, Global Flow of Tertiary-Level Students, 2022. [Date of visit: 12.7.2022]. disponible: http://uis.unesco.org/en/uis-student-flow

234. *UNESCO*, Institute for statistics, *How much does your country invest in R&D?*, 2021.

235. UNESCO. *Report on Trends and Developments in Higher Education in Europe: 2006-2016*, 2013. Paris: European Centre for Higher Education press, 2013. 36 p. disponible: https://unesdoc.unesco.org/ark:/48223/pf0000130336

236. *UNESCO* - The web site with the data of the world's mobile students ©2017 [Date of visit: 10.11.2019]. disponible: http://www.uis.unesco.org/ Education/ Pages /international

237. WORLD BANK DATA, Age dependency ratio (% of working age population)- 1960-2020, 2019. disponible: https://data.worldbank.org/indicator/SP.POP.DPND

238. WORLD BANK GROUPP, Migration and Brain Drain, Europe and Central Asia economic update, Office of the Chief Economist, Fall, 2019. 39 P. ISBN (electronic): 978-4648-1506-5. disponible: https://books.google.co.il/books?id=Vo-3DwAAQBAJ&pg=PR4&lpg=PR4&dq=The+ratio+of+the+working+age+population+to+the+total+population+in+high-income+countries,+low-income+countries+and+the+world,+1980%E2%80%942060&source=bl&ots=Hpbqn5Ha_a&sig=ACfU3U0C4GELyzCF0-Snah9RvtMbmjZB5w&hl=en&sa=X&ved=2ahUKEwj87aSW3af5AhWKCOwKHZCgCG0Q6AF6BAgCEAM#v=onepage&q=The%20ratio%20of%20the%20working%20age%20population%20to%20the%20total%20population%20in%20high-income%20countries%2C%20low-income%20countries%20and%20the%20world%2C%201980%E2%80%942060&f=false

**RUSSIAN REFERENCE**

239. Быстряков А Я, Григорьева Е.М, Должикова А В. *Интелектуальный Капитал и Интелектуальная Миграция в условиях глобализации: монография*, 2018, Moscow: Проспект. 600 с.

**MOLDAVIAN REFERENCE**

240. CIULPAN-DRAGOMIRESCU, L.-L. *Migrația internațională a tinerilor.* În: Centre for Studies in European Integration Working Papers Series, 2019, No. 13, p. 59-66. ISBN 978-9975-3590-2-3.

241. COSTIN, N. *Rethinking Brain Drain in Moldova: Migrant Youth Development.* În: Central European University, 2012, No 5, 61 p.

242. LAZARI, S., GRIBINCEA, A., SULYM, A. *The experience of countries in diminuing the*

*experience of brain drain.* În: World economy and international economic relations, 2020, No 3, pp. 51-60. ISBN 978-611-01-1615-2.

243. MORARU, V. *Brain drain: cazul Republicii Moldova*. Chișinău: Sirius, 2011. 260 p. ISBN 978-9975-57-015-2.

244. NICHITCIN, C. *Exodul de intelect în contextul globalizării: cauze şi consecinţe*. În: Materialele Conf. şt.-practice Intern., Bălţi, 21-22 oct. 2012. No 1, p. 53-54.

245. PORCESCU, S., NESTOROWICZ, J., MARKOWSKI, S. *Moldovan Migration Policy Dilemma: Brain Drain or Jobless Growth?* În: CARIM-East Research Report, 2014, pp. 56-61. ISSN 1857-1999 EISSN 2345-1963.

246. PORCESCU, S., VARZARI, V. *Diaspora ştiinţifică a Republicii Moldova: de la exodul de creiere la circulaţia cunoştinţelor.* În: Mediul Ambiant, 2011, No 56(2), pp. 73-84. ISBN 1810-9551.

247. REICU, A. *Exodul de creiere–un fenomen de neoprit în Republica Moldova*. În: Interuniversitaria, 2019, no. 7, pp. 87-90. ISBN 978-9975-50-234-4.

248. STOICA, I. *Exodul creierelor–premise și implicații. Cazul României*. Monitor Strategic, 2009, No 3-4, pp. 109-120. ISSN 1582-3156.

249. STRATAN A., CHISTRUGA M., CLIPA V., FALA A., SEPTELICI V. *Development and Side Effects of Remittances in the CIS Countries: The Case of Republic of Moldova*. În: Working paper, Institute of Economy, Finance and Statistics, Chisnau: Academy of Sciences of Moldova, 2013, No 3, 56 p.

# ANNEXES

## Annex 1

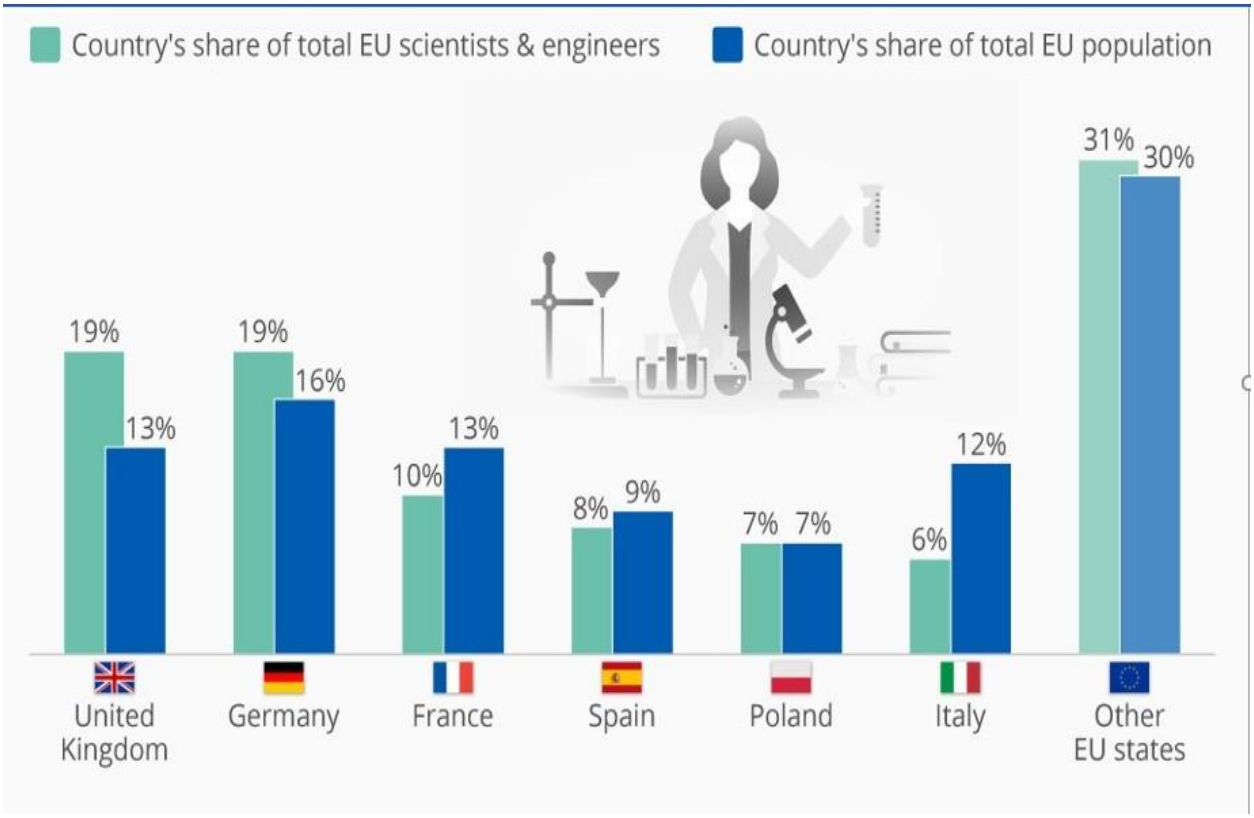
## Social and economic factors of the world-system

| Social and economic factors of world-system | Expenses for education and for preparation of specialists and scientists | Overall number of specialists and scientists | The level of qualification of specialists | National specialists' composition | The number of jobs in high-tech sector | Level of payment for professionals in high-tech industries | The efficiency of economic growth |
|---|---|---|---|---|---|---|---|
| The center (core) of the world-system (developed countries), mainly import specialists and scientists | Money is saved in the range of 60 billion $ at the expense of migrants from all developing countries (UN data) - up to trillion dollars only at the expense of migrants from Israel (estimates of Israeli scientists). | It is growing, reaching about 3.5 million people in OECD countries(OECD data). | In general, it grows with the growing shortage of personnel covered by 10-40% (in different industries) at the expense of migrants (data from the HSE and the Center for Scientific, Information and Educational Programs). | The foreign component is growing. Only the Hindus make up 12% of US scientists, Europeans - about 40%. In the US IT sector, about 18.3% (640,000 people) are foreigners (data from I. Tsapenko). | It is shrinking. Only in the US IT sector in 2004 - by 100,000 in 2005 - by 120,000, according to forecasts - in 2006 - by 150,000 in 2008 - by 220, 000 In 2010-by 275,000. In 2002-2010, a reduction of 30% was expected. In the financial sphere, in the next 5 years, the loss of 500 thousand places is expected (data and forecast of the company “AT Keagpegu”). | It is partially falling. For 2002-2003 the salary of programmers in the United States fell by 15% and in the coming years another 10% of fall is expected (data from the research company Forrester). | Positive and long-term growth while maintaining the existing conditions. Improving the quality of labor. The complication of the situation in the labor market, and the manifestation of elements of erosion of national-cultural identity. |
| Semi and Periphery of the world -system (NIC and developing countries), mainly export professionals and scientists | Significant direct financial loss (see above), not counting incommensurably big missed benefits from unreceived results of specialists who left the country | In general, it is growing, with a noticeable braking because of the departure. General number is in the range of 1.5-2 million people. (Calculations of the author). | Practically it does not grow in conditions of loss from 10 to 40% of specialists, and in some countries of Southeast Asia - up to 50%, in Africa - even up to 75%. There are elements of the degradation of human capital (ILO data). | Practically, it is not changing | It is growing. In India alone, higher education institutions annually increase the output of programmers by 10 thousand people. Totally, in India there are 160 thousand programmers of the highest qualification. and about 500 thousand ordinary specialists (data from the Newsweek magazine. 2004. 14.06.-20.06.) In Israel 2003/they provided more than 225 thousand programmers of various qualifications, which is 11.2% more than the previous year (data from the newspaper Izvestiya Nauki. 04.08.04.). | It is lowly growing. It can be explained taking into account the existing difference in the amount of payment: for the same work, the American programmer receives 50-80,000 dollars a year, Indian - 3-5,000 dollars (data from the journal "Expert". 2004. № 10). | Unsustainable growth, partly due to the accumulated potential of catch-up development, including access to the newest industries through the specialists in developed countries. The special influence should be paid increasing the dependence on foreign labor demand. |

Sources: [5, 23, 60, 68, 72, 105, 233]

**Annex 2**

**Brain drain within the EU? Distribution of scientists and engineers in the European Union, by location, 2017**

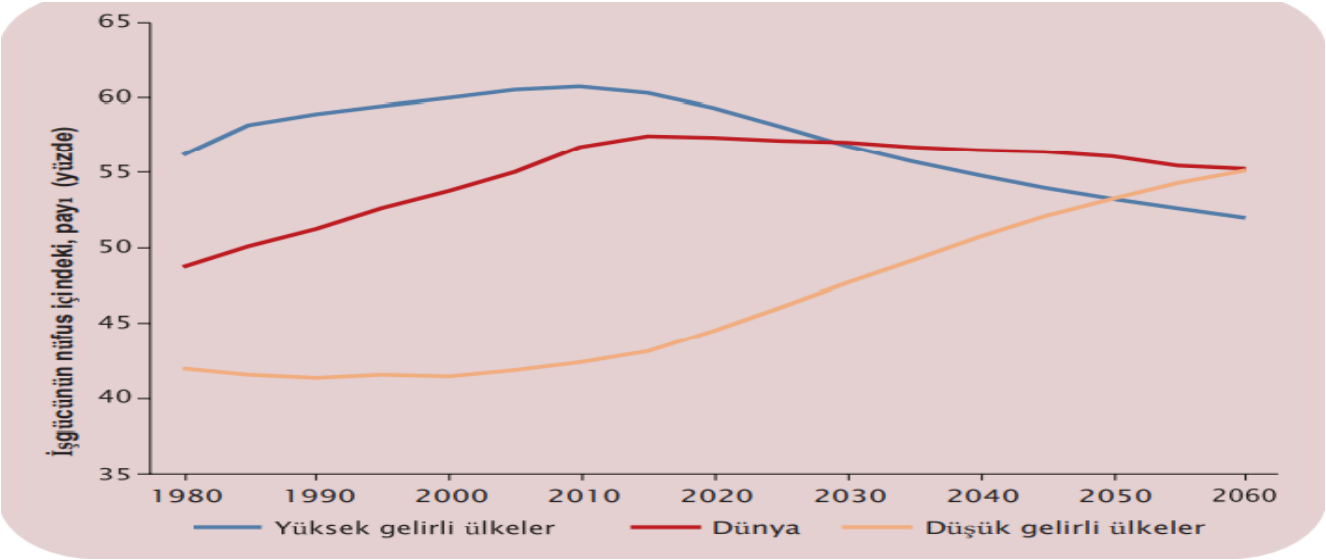



(Aged between 25 and 64)

Source: [191]

**Annex 3**

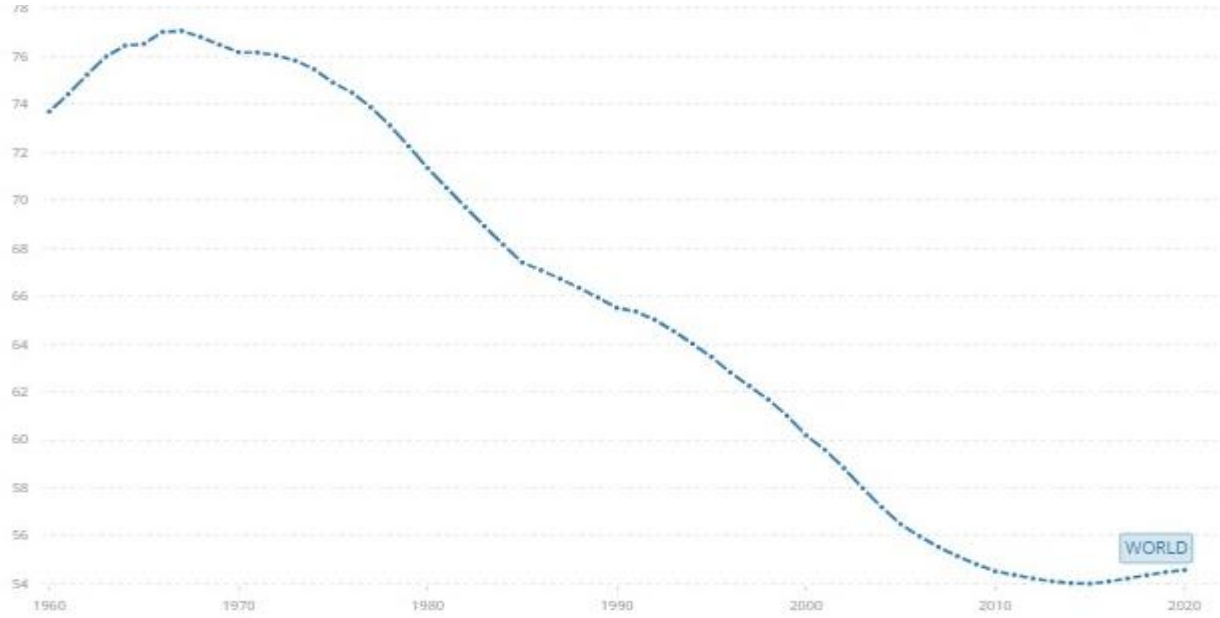
**The ratio of the working- age population to the total population in high-income countries, low-income countries and the world, 1980—2060**




Source: [237, p. 39]

**Annex 4**

**Age dependency ratio (% of working age population)- 1960- 2020, 2019**

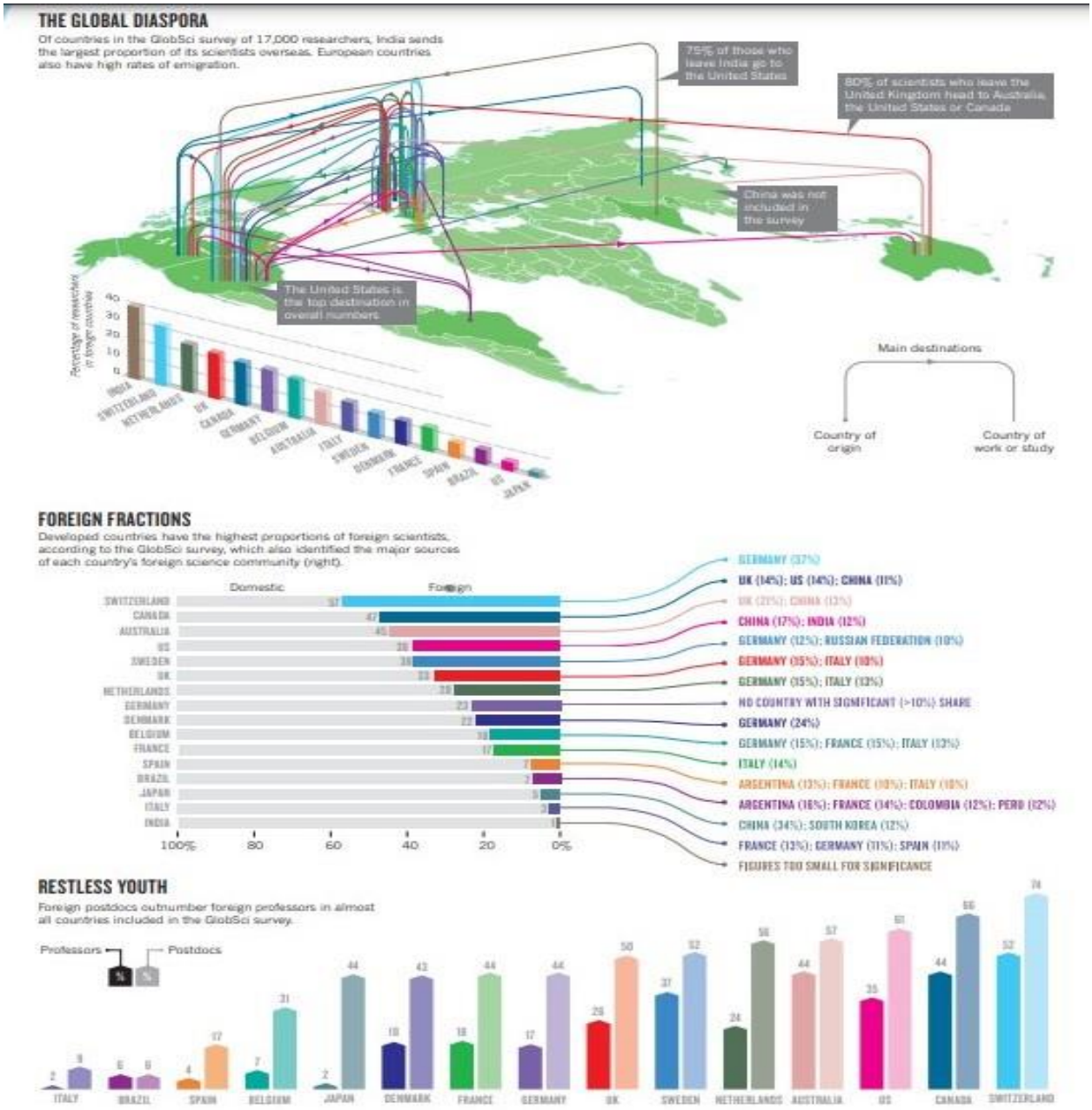



(World Bank staff estimates based on age distributions of United Nations Population Division's World Population Prospects: 2019 Revision.)

Source: [236]

**Annex 5**

**Proportions of foreign scientists in 16 countries according to the GlobSci survey, 2016**

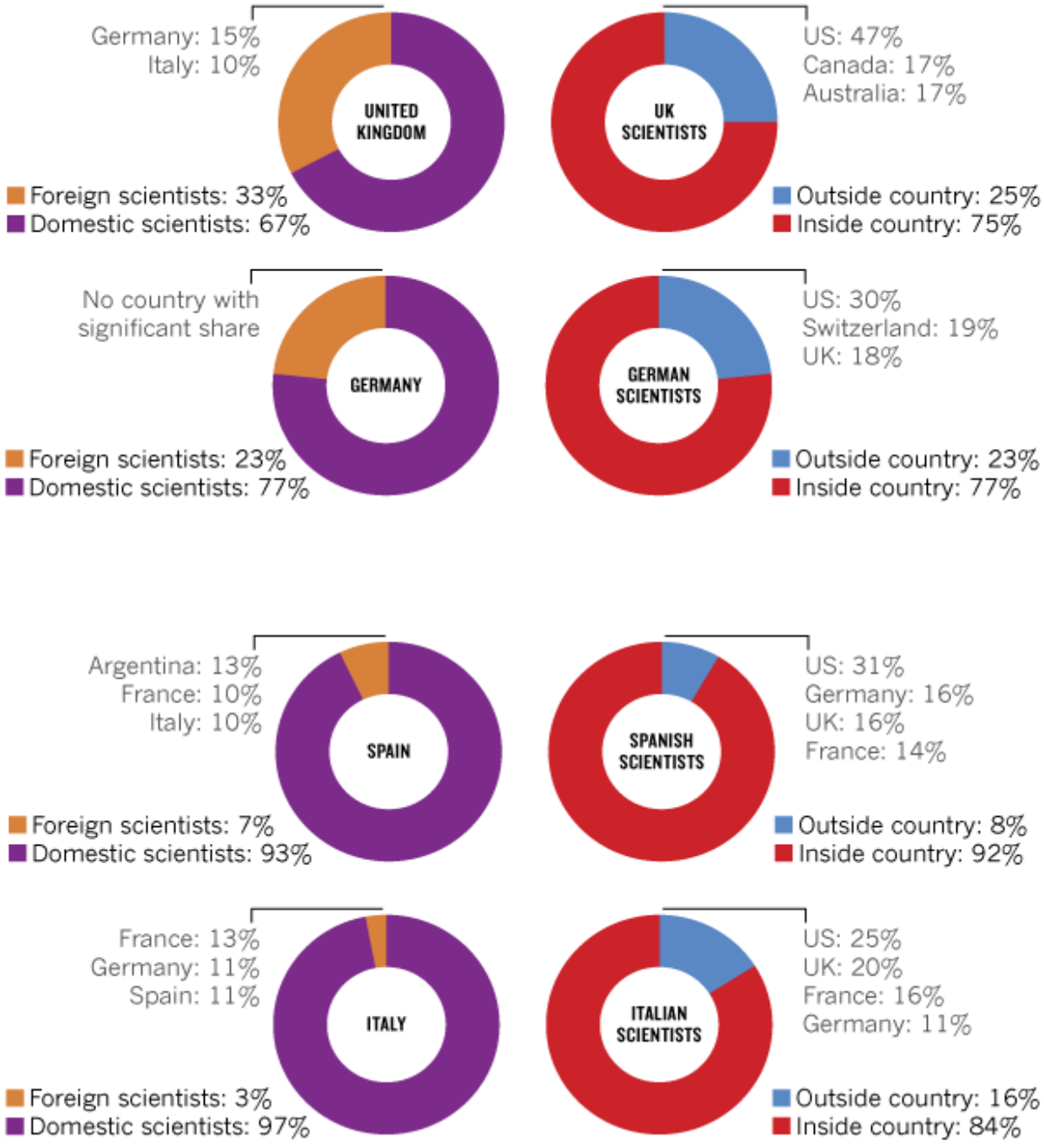



(*The bottom bar graph distinguishes shares of postdocs and professors in the European countries appearing in the top graph.)*

**Sources:** [109, p. 2, 160, p. 327]

**Annex 6**

**Proportions of incoming foreign scientists (left) and outgoing national scientists (right) in selected European countries, 2016**



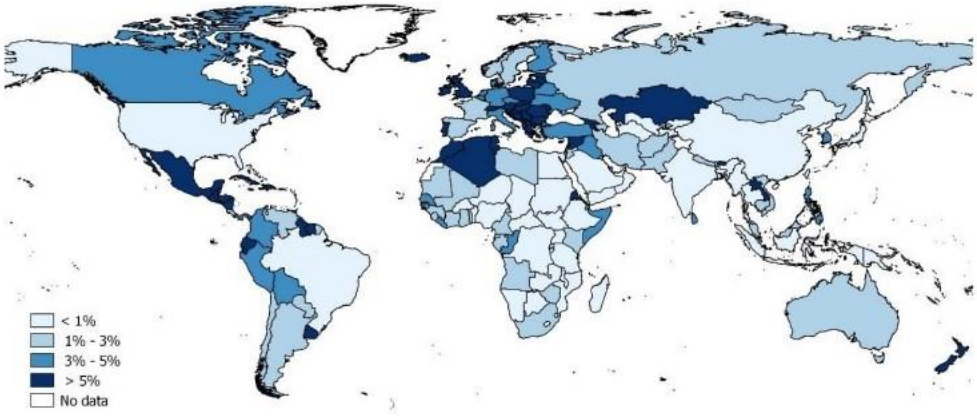

(The countries of origin or destination are specified if they correspond to at least 10% of total migrating scientists)

Sources: [65, p. 169, 109, p. 3, 215]

**Annex 7**

**Comparing The total emigration rates to OECD countries**

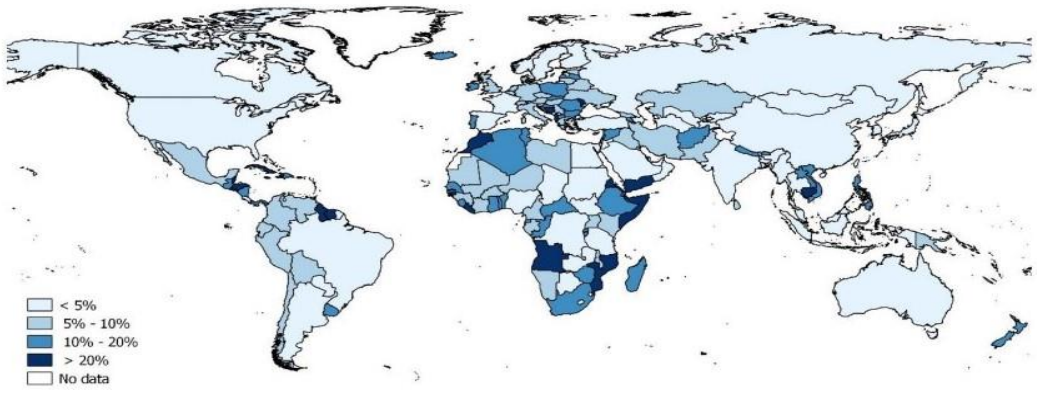
**A7.1 The proportion of the total emigration rates to OECD countries, 2015/16**




Note: The emigration rate is calculated as the ratio between the number of emigrants living in OECD countries and the total sum of the resident population and emigrants living in OECD countries.

**Source**: [180, p. 23]

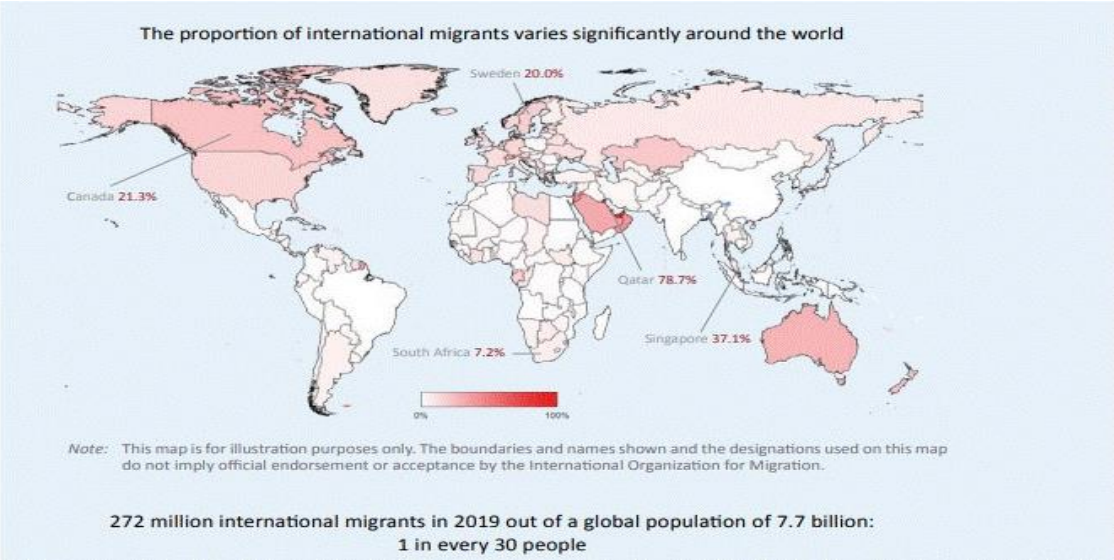
**A7.2 Emigration rates of the highly educated to OECD countries, 2015/16**




Note: The emigration rate is calculated as the ratio between the number of migrants living in the OECD countries, and the total sum of the resident population and emigrants living in OECD countries.

**Source**: [180, p. 25]

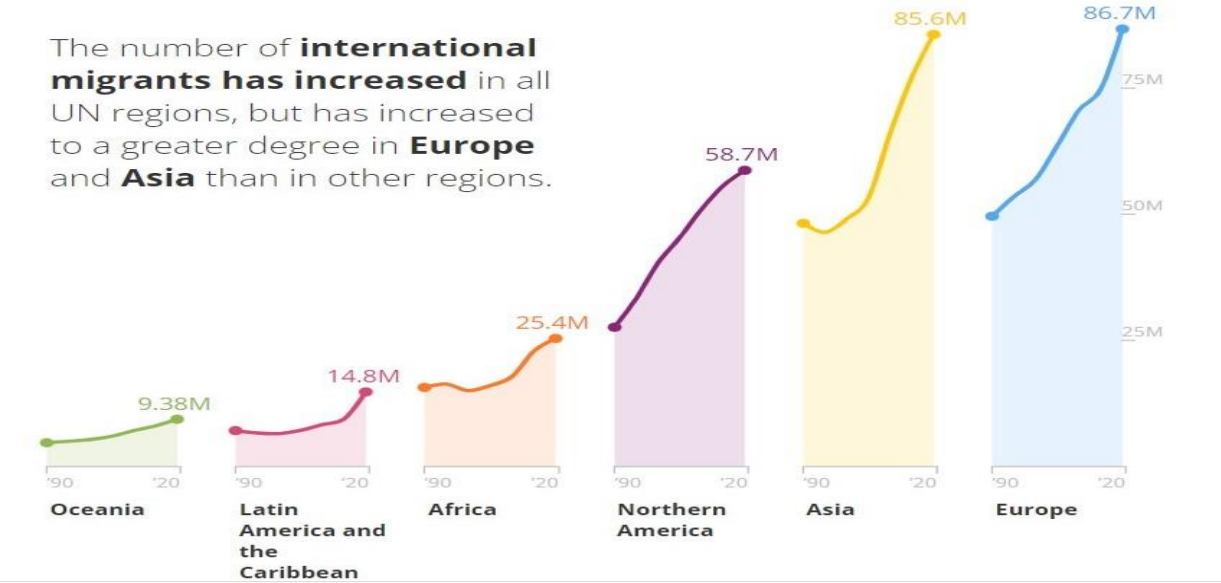
**A7.3 The proportion of international migrants around the world, 2019**




It`s clear that the proportion of international migrants varies significantly around the world.

**Source:** [209]

**A7.4 The numbers of international migrants around the world, 1990-2020**

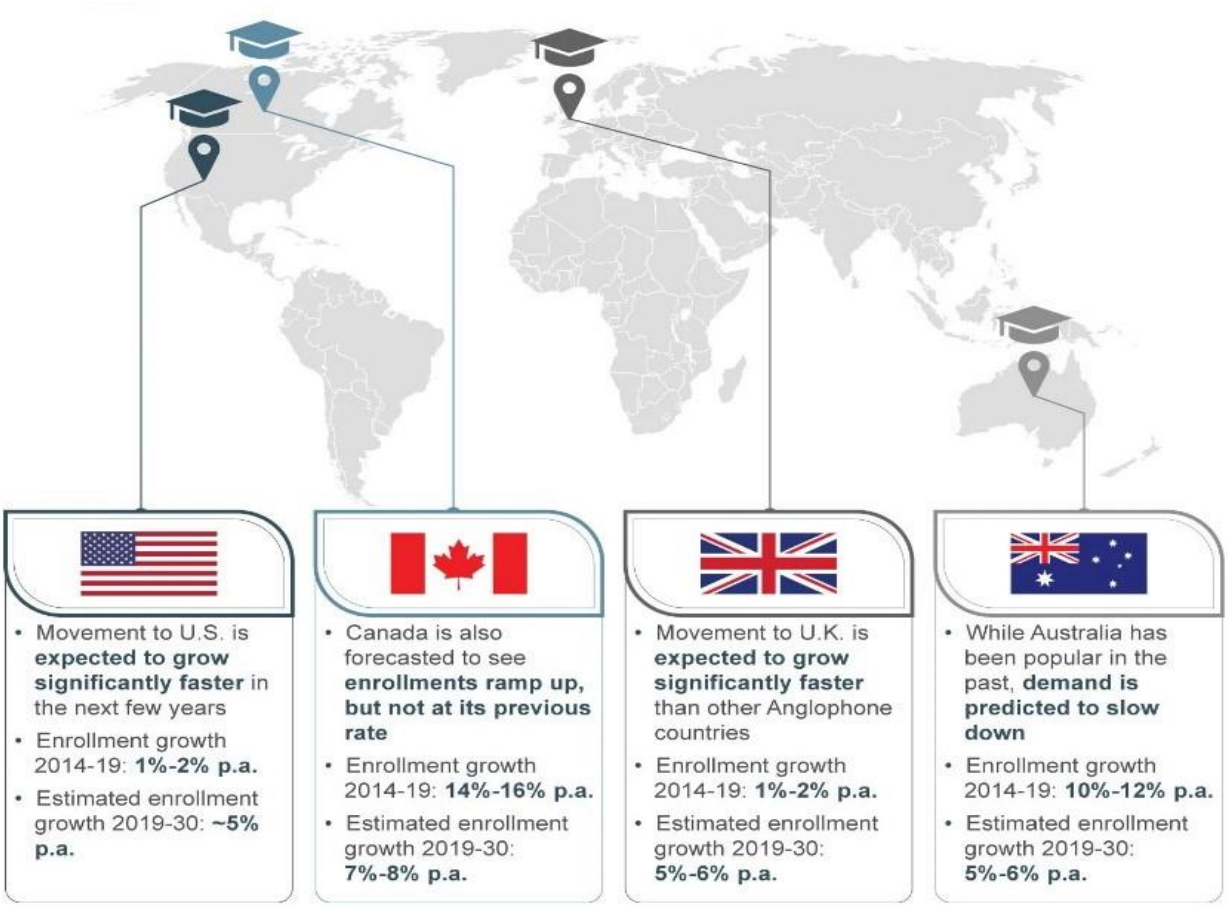



This interactive uses the latest international migrant stock data, published by UN DESA in January 2021, whereas the World Migration Report 2020 draws upon the latest available data at the time of publication (November 2019).

**Source**: [209]

**Annex 8**

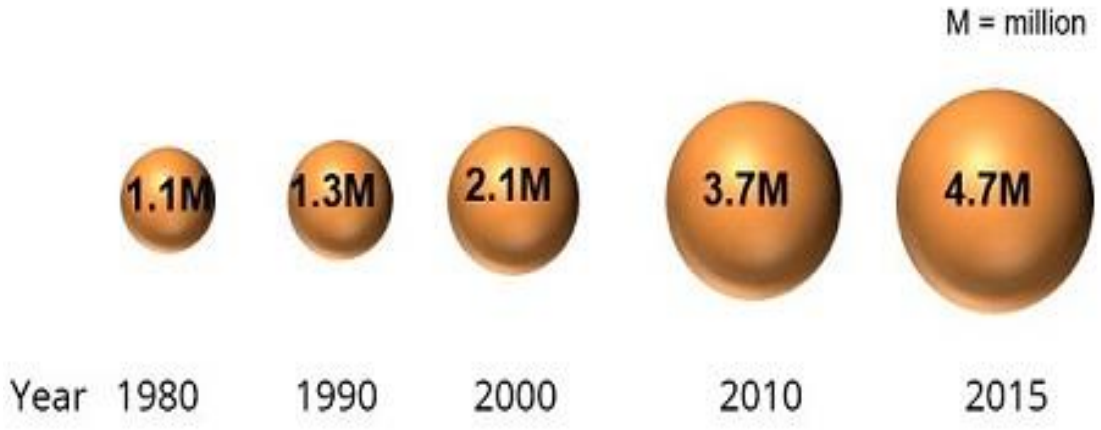
**Shifting international student enrollment trends in key Anglophone destinations, 2014-2030**




Source: [153]

**Annex 9**

**The long-term trend in the global numbers of international student's mobile between the years 1980-2015**

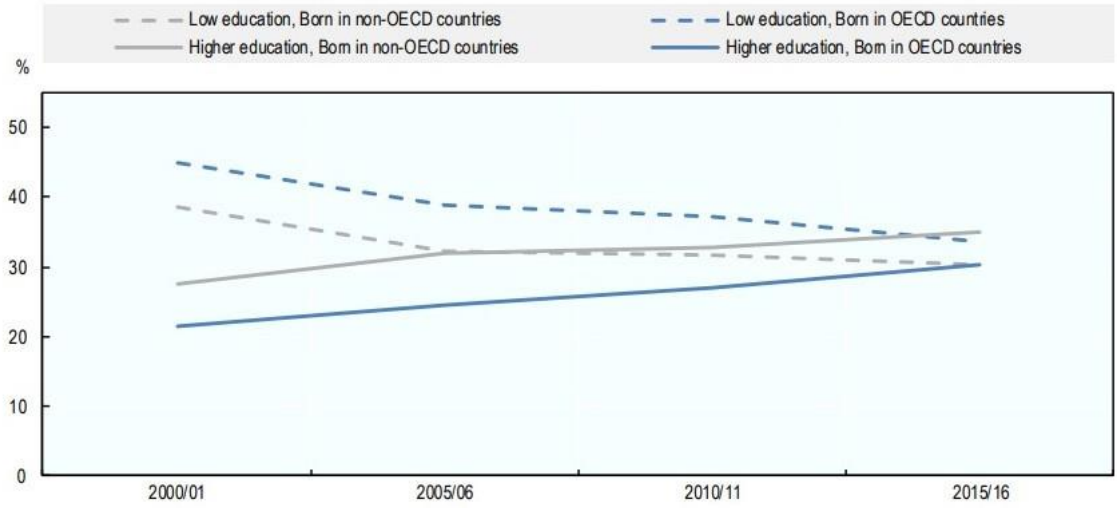



Source: [231]

**Annex 10**

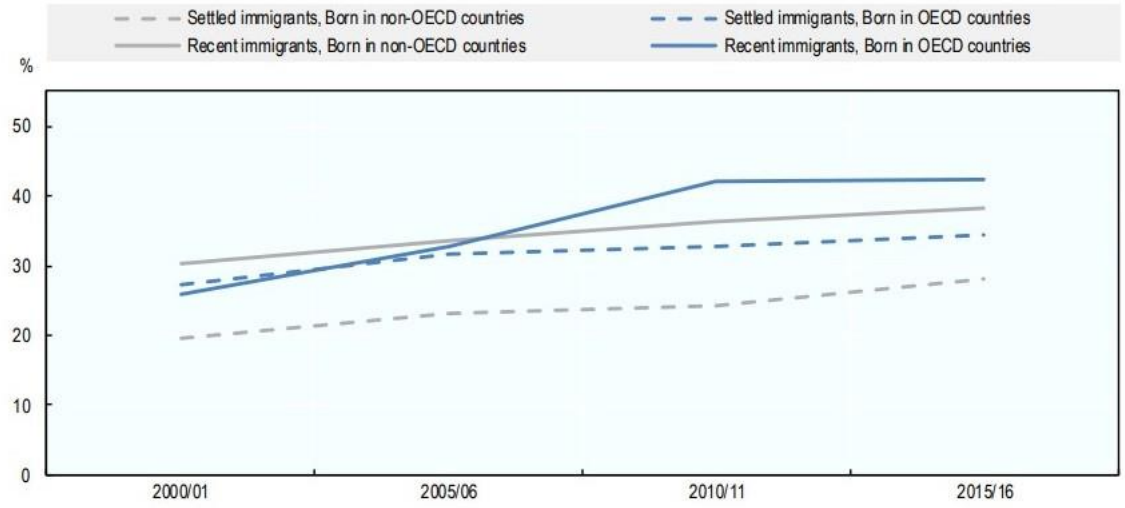
**The share of migrants, 2000/01 to 2015/16 (%)**

**A10.1 The share of low and high educated migrants, by the county of birth in OECD and non-OECD countries, 2000/01 to 2015/16 (%)**




**Source:** [180, p. 21]

**A10.2 The share of high-educated migrants, by group of countries of birth and duration of stay, 2000/01 to 2015/16**




*Source*: Database on Immigrants in OECD Countries (DIOC) 2000/01, 2005/06, 2010/11 and 2015/16.

**Source**: [180, p. 21]

**Annex 11**

**Top 15 countries in terms of emigration rate of high-skilled, number of high-skilled emigrants and difference in rates between 2000/01 and 2015/16**

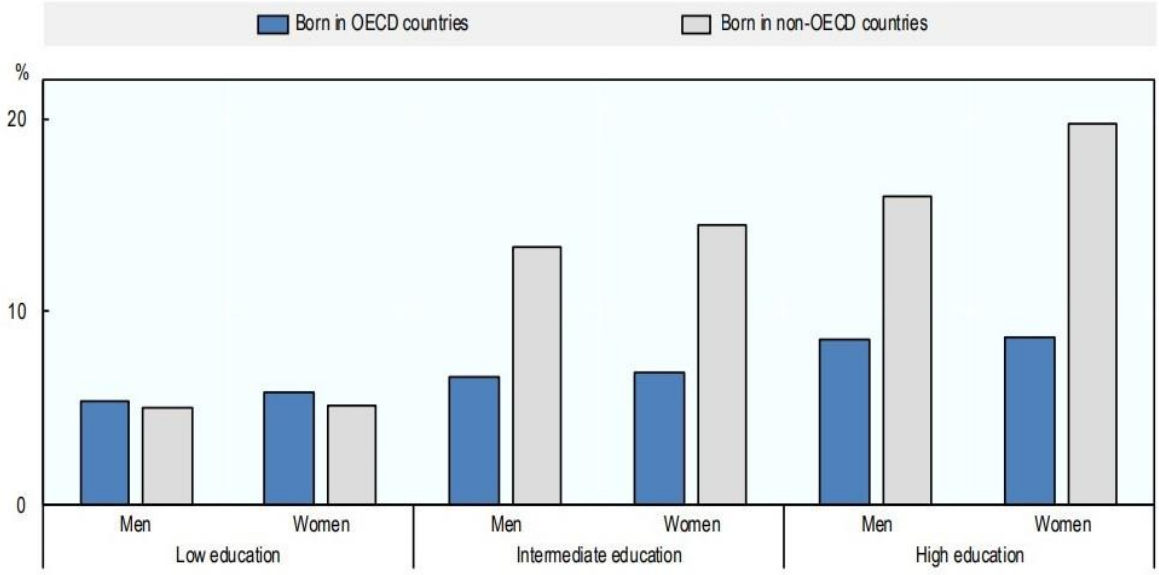
| | Emigration rate of high-skilled (%) | | High-skilled emigrants (1000) | | Increase in emigration rate of high skilled (pp) |
|---|---|---|---|---|---|
| Guyana | 70.8 | India | 3 086 | Liberia | 27.9 |
| Trinidad and Tobago | 65.6 | China | 2 001 | Bhutan | 15.4 |
| Mauritius | 62.5 | Philippines | 1 794 | Moldova | 14.6 |
| Liberia | 57.0 | United Kingdom | 1 681 | Albania | 14.6 |
| Jamaica | 50.3 | Germany | 1 435 | Romania | 11.8 |
| Haiti | 48.7 | Poland | 1 174 | Bosnia and Herzegovina | 11.5 |
| Fiji | 39.2 | Mexico | 1 136 | Somalia | 10.4 |
| Albania | 38.1 | Russia | 1 074 | Bulgaria | 10.3 |
| Bosnia and Herzegovina | 34.0 | Ukraine | 774 | North Macedonia | 10.0 |
| Guinea-Bissau | 32.4 | Romania | 773 | Nepal | 9.6 |
| Cuba | 31.1 | France | 752 | Zimbabwe | 9.4 |
| Mozambique | 29.7 | United States | 654 | Mauritius | 8.4 |
| Somalia | 29.4 | Canada | 635 | Cuba | 6.9 |
| Congo | 26.4 | Vietnam | 633 | Armenia | 6.6 |
| Rwanda | 26.0 | Italy | 587 | Guinea | 6.6 |

The emigration rate is calculated as the ratio between the number of emigrants living in OECD countries and the total sum of the resident population and emigrants living in OECD countries.

**Source:** [180, p. 27]

**Annex 12**

**The rate of emigration by the level of education, gender, and the country of birth in OECD and non-OECD countries, 2015-2016**

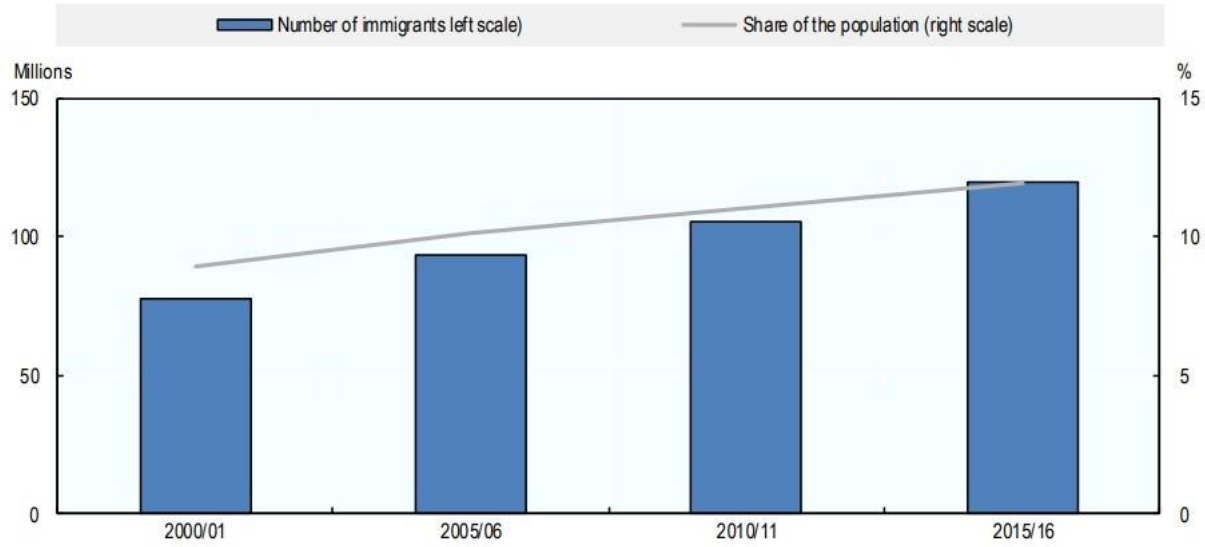



**Source**: [180, p. 27]

**Annex 13**

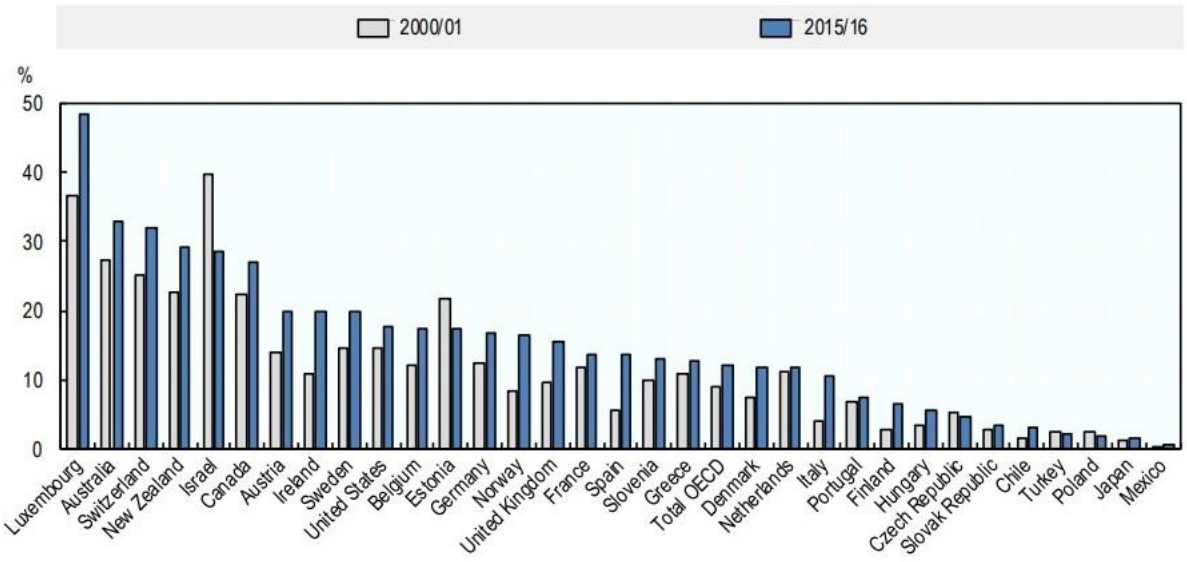
**Immigrant population (15+) in OECD countries, 2000/01 to 2015/16**

**A13.1 Immigrant population (15+) in OECD countries, by number of immigrants and share of the Population, 2000/01 to 2015/16**



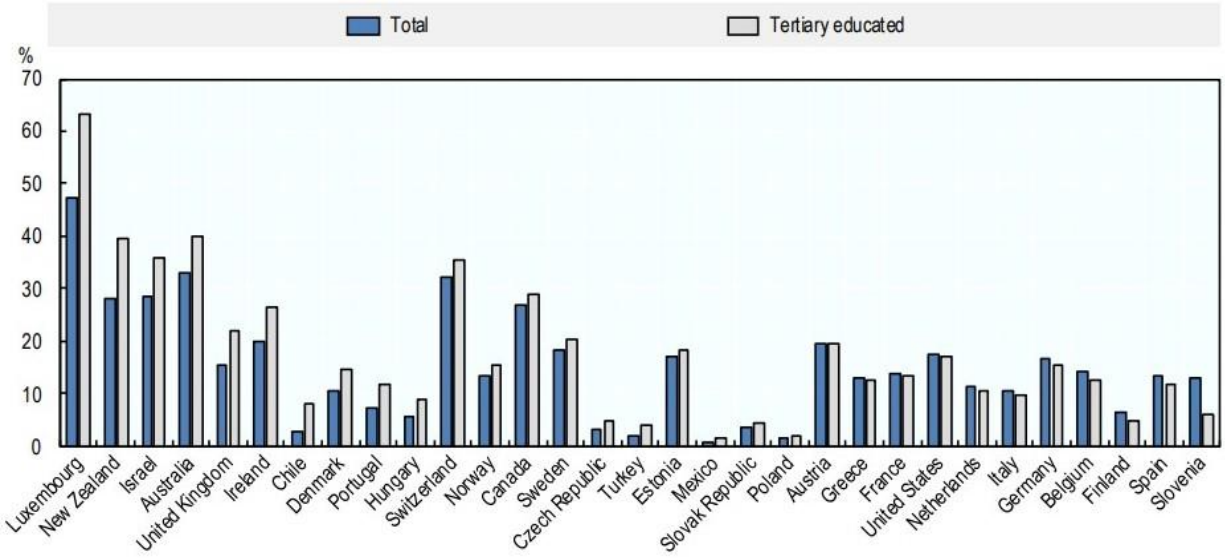

**Source**: [180, p. 14]

**A13.2 Share of immigrants in the population (15+) in OECD countries, 2000/01 and 2015/16**




**Source**: [180, p. 14]

**A13.3 Share of immigrants in the total population and among the tertiary-educated (15+) in OECD countries, 2015/16**




**Source**: [180, p. 16]

**A13.4 Characteristics of the immigrant population aged 15+ in OECD countries, 2015/16**

| Country of residence | Foreign-born population 15+ (thousands) | Born in OECD countries (%) | Women (%) | Persons aged 15-24 (%) | Persons aged 65+ (%) | Duration of stay 0-5 years (%) | Tertiary educated (%) |
|---|---|---|---|---|---|---|---|
| Australia | 5 791 | 43.6 | 51.5 | 10.6 | 21.2 | 19.8 | 47.4 |
| Austria | 1 491 | 47.4 | 51.2 | 11.4 | 14.0 | 21.1 | 25.9 |
| Belgium | 1 601 | 51.2 | 50.7 | 11.5 | 14.7 | 27.8 | 26.8 |
| Canada | 7 738 | 30.9 | 52.3 | 9.8 | 22.0 | 13.9 | 59.5 |
| Switzerland | 2 236 | 63.2 | 51.0 | 7.3 | 14.0 | 43.2 | 33.7 |
| Chili | 405 | 9.6 | 53.4 | 20.1 | 4.3 | 44.8 | - |
| Czech Republic | 415 | 39.1 | 42.5 | 9.2 | 4.9 | 13.5 | 29.4 |
| Germany | 12 011 | 43.5 | 49.5 | 8.6 | 15.1 | 20.0 | 21.7 |
| Denmark | 564 | 46.7 | 50.4 | 14.6 | 8.8 | 31.7 | 41.0 |
| Spain | 5 262 | 20.6 | 53.4 | 13.3 | 7.3 | 11.8 | 24.2 |
| Estonia | 190 | 9.7 | 58.7 | 3.0 | 41.1 | 6.7 | 35.5 |
| Finland | 299 | 40.1 | 49.3 | 12.6 | 5.6 | 28.7 | 22.5 |
| France | 7 407 | 32.1 | 51.8 | 8.5 | 22.8 | 12.9 | 26.6 |
| United Kingdom | 8 116 | 40.4 | 52.5 | 11.6 | 11.8 | 21.1 | 42.1 |
| Greece | 1 184 | 24.8 | 54.7 | 9.7 | 10.6 | 18.7 | 19.0 |
| Hungary | 460 | 22.7 | 50.1 | 11.0 | 18.1 | 15.3 | 28.6 |
| Ireland | 735 | 72.2 | 51.1 | 14.4 | 6.6 | 26.0 | 43.9 |
| Israel | 1 744 | 17.4 | 55.1 | 5.4 | 37.9 | 5.3 | 49.3 |
| Italy | 5 532 | 17.5 | 54.9 | 10.7 | 5.3 | 8.5 | 12.1 |
| Japan | 1 593 | 30.6 | 54.5 | 17.1 | 8.2 | - | - |
| Luxembourg | 228 | 83.0 | 51.0 | 8.7 | 10.7 | 7.0 | 45.8 |
| Mexico | 487 | 64.1 | 49.9 | 33.0 | 10.2 | 23.2 | 30.7 |
| Netherlands | 1 625 | 37.7 | 54.1 | 8.0 | 12.2 | 11.6 | 26.1 |
| Norway | 702 | 50.4 | 47.6 | 12.7 | 6.3 | 36.1 | 39.0 |
| New Zealand | 1 082 | 40.2 | 50.9 | 14.4 | 16.3 | 20.2 | 39.2 |
| Poland | 565 | 33.4 | 58.3 | 5.7 | 67.7 | 5.3 | 21.2 |
| Portugal | 661 | 26.9 | 56.2 | 11.1 | 8.1 | 7.2 | 27.8 |
| Slovak Republic | 160 | 77.8 | 49.6 | 4.7 | 30.0 | 6.1 | 20.9 |
| Slovenia | 230 | 8.7 | 43.4 | 6.2 | 18.0 | 27.8 | 10.8 |
| Sweden | 1 624 | 38.5 | 50.3 | 12.2 | 15.4 | 29.2 | 32.5 |
| Turkey | 1 358 | 29.5 | 54.5 | 13.1 | 13.7 | 38.3 | 24.4 |
| United States | 46 151 | 40.4 | 51.6 | 9.7 | 15.7 | 13.8 | 34.0 |
| **Total OECD** | **119 648** | **37.8** | **51.8** | **10.2** | **15.7** | **16.5** | **33.2** |

**Source**: [180, p. 17]

**A13.5 Characteristics of the immigrant population aged 15+ in OECD countries by region of birth, 2015/16**

| Region of birth | Foreign-born population 15+ (thousands) | Women (%) | Persons aged 15-24 (%) | Persons aged 65+ (%) | Duration of stay 0-5 years (%) | Tertiary educated (%) |
|---|---|---|---|---|---|---|
| Africa | 12 510 | 48.2 | 10.3 | 13.5 | 15.9 | 30.8 |
| Asia | 31 297 | 52.3 | 11.9 | 12.9 | 22.2 | 46.9 |
| Europe | 41 572 | 52.8 | 8.2 | 21.2 | 15.9 | 32.2 |
| North America | 2 533 | 52.0 | 15.6 | 18.4 | 18.3 | 53.7 |
| Oceania | 1 514 | 50.2 | 11.5 | 12.5 | 16.6 | 37.9 |
| Latin America | 29 980 | 51.6 | 10.7 | 11.9 | 11.7 | 20.1 |

**Source**: [180, p. 17]

**A13.6 Number of immigrants (15+) in the top 10 OECD destination countries, 2000/01 to 2015/16 (in millions)**

| 2000/01 | | 2005/06 | | 2010/11 | | 2015/16 | | Main origin countries 2015/16 | Growth 2000/01-2015/16 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Mexico | 8.3 | Mexico | 10.8 | Mexico | 11.3 | Mexico | 11.7 | Mexico | 40.5 |
| United Kingdom | 3.3 | United Kingdom | 3.4 | United Kingdom | 3.7 | India | 4.8 | India | 144.8 |
| Germany | 3.2 | Germany | 2.9 | China | 3.6 | China | 4.6 | China | 123.0 |
| Italy | 2.4 | Poland | 2.9 | India | 3.6 | Poland | 3.9 | Poland | 79.5 |
| Poland | 2.2 | India | 2.8 | Germany | 3.5 | United Kingdom | 3.7 | United Kingdom | 12.5 |
| Turkey | 2.1 | China | 2.7 | Poland | 3.3 | Philippines | 3.5 | Philippines | 83.1 |
| China | 2.1 | Turkey | 2.6 | Philippines | 3.0 | Germany | 3.5 | Germany | 12.5 |
| Russia | 2.0 | Philippines | 2.5 | Romania | 2.7 | Romania | 3.5 | Romania | 213.2 |
| India | 2.0 | Russia | 2.4 | Turkey | 2.6 | Morocco | 3.0 | Morocco | 77.4 |
| Philippines | 1.9 | Italy | 2.3 | Morocco | 2.6 | Turkey | 2.5 | Turkey | 19.4 |
| Total top 10 | 29.4 | Total top 10 | 35.4 | Total top 10 | 39.9 | Total top 10 | 44.9 | Total top 10 | 52.8 |
| Total | 78.1 | Total | 91.9 | Total | 105.7 | Total | 119.6 | Total | 53.3 |

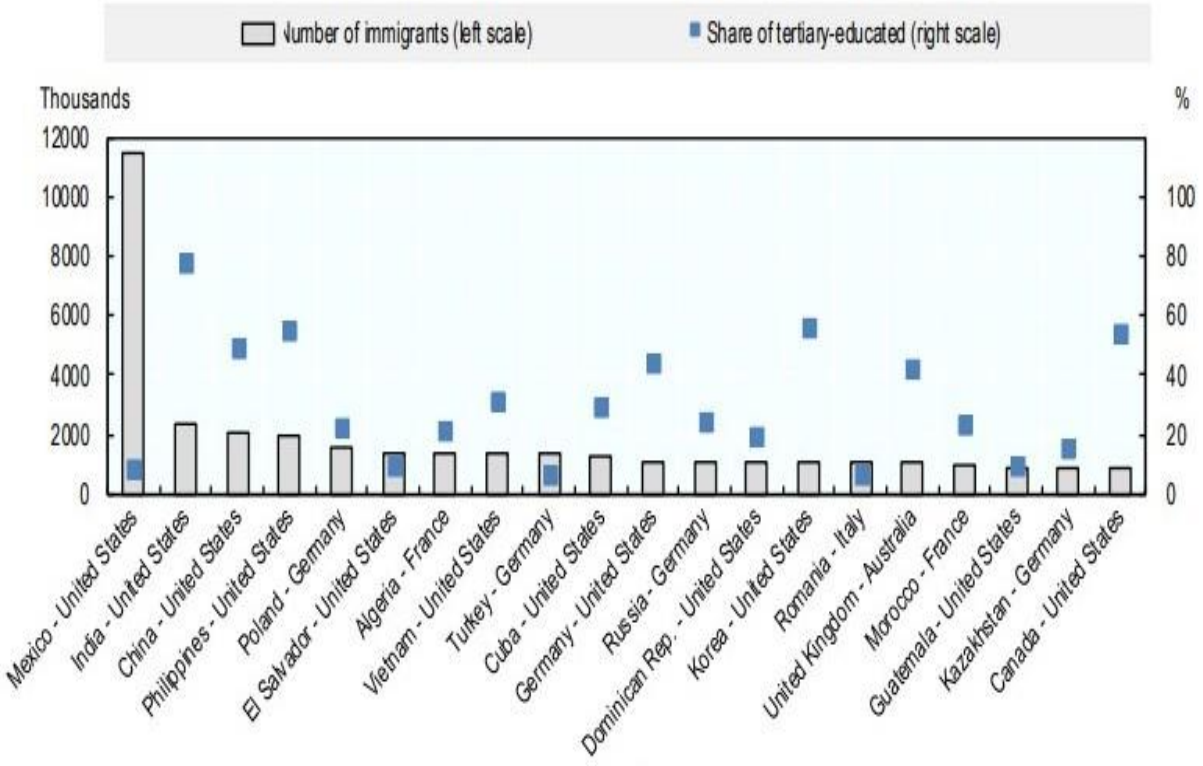
**Source**: [180, p. 18]

**A13.7 Number of immigrants (15+) born in the top 10 origin countries and living in OECD countries, 2000/01 to 2015/16 (in millions)**

| 2000/01 | | 2005/06 | | 2010/11 | | 2015/16 | | Main origin countries 2015/16 | Growth 2000/01-2015/16 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Mexico | 8.3 | Mexico | 10.8 | Mexico | 11.3 | Mexico | 11.7 | Mexico | 40.5 |
| United Kingdom | 3.3 | United Kingdom | 3.4 | United Kingdom | 3.7 | India | 4.8 | India | 144.8 |
| Germany | 3.2 | Germany | 2.9 | China | 3.6 | China | 4.6 | China | 123.0 |
| Italy | 2.4 | Poland | 2.9 | India | 3.6 | Poland | 3.9 | Poland | 79.5 |
| Poland | 2.2 | India | 2.8 | Germany | 3.5 | United Kingdom | 3.7 | United Kingdom | 12.5 |
| Turkey | 2.1 | China | 2.7 | Poland | 3.3 | Philippines | 3.5 | Philippines | 83.1 |
| China | 2.1 | Turkey | 2.6 | Philippines | 3.0 | Germany | 3.5 | Germany | 12.5 |
| Russia | 2.0 | Philippines | 2.5 | Romania | 2.7 | Romania | 3.5 | Romania | 213.2 |
| India | 2.0 | Russia | 2.4 | Turkey | 2.6 | Morocco | 3.0 | Morocco | 77.4 |
| Philippines | 1.9 | Italy | 2.3 | Morocco | 2.6 | Turkey | 2.5 | Turkey | 19.4 |
| Total top 10 | 29.4 | Total top 10 | 35.4 | Total top 10 | 39.9 | Total top 10 | 44.9 | Total top 10 | 52.8 |
| Total | 78.1 | Total | 91.9 | Total | 105.7 | Total | 119.6 | Total | 53.3 |

**Source**: [180, p. 19]

**A13.8 Top 20 migration corridors towards OECD countries, 2015/16**

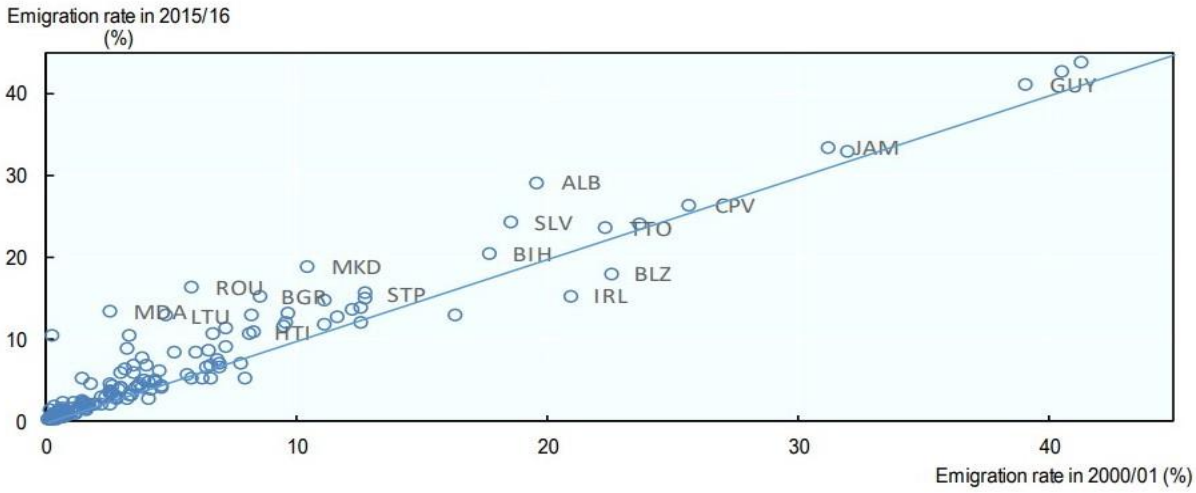



**Source**: [180, p. 20]

**Annex 14**

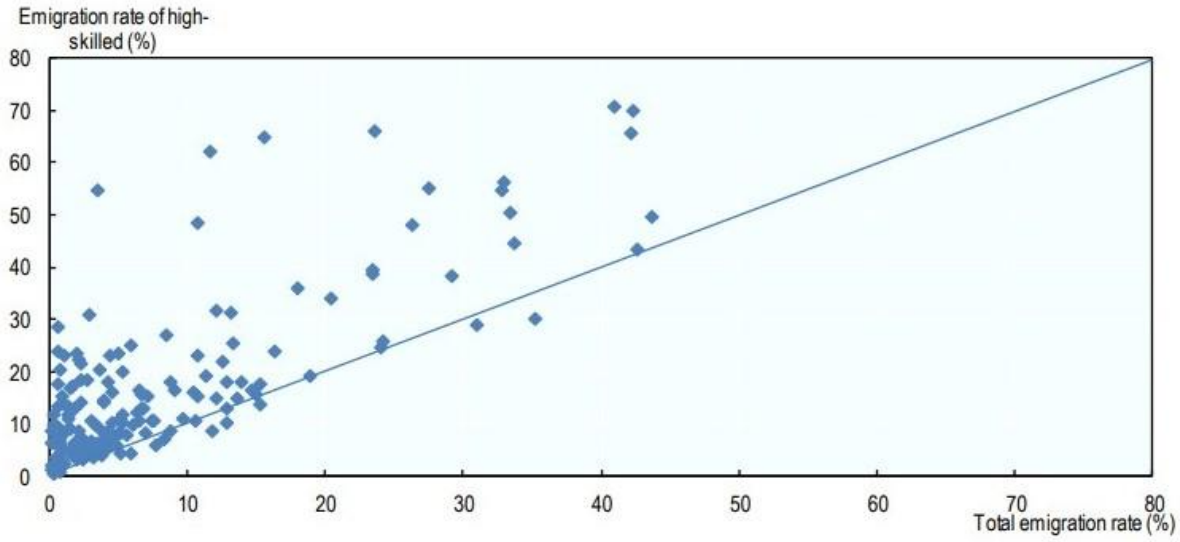
## Total emigration rates, 2000/01 and 2015/16

### A14.1 Total emigration rates in countries around the world, 2000/01 and 2015/16




**Source**: [180, p. 23]

### A14.2 Total emigration rate and emigration rate of the high-skilled, 2015/16 (%)

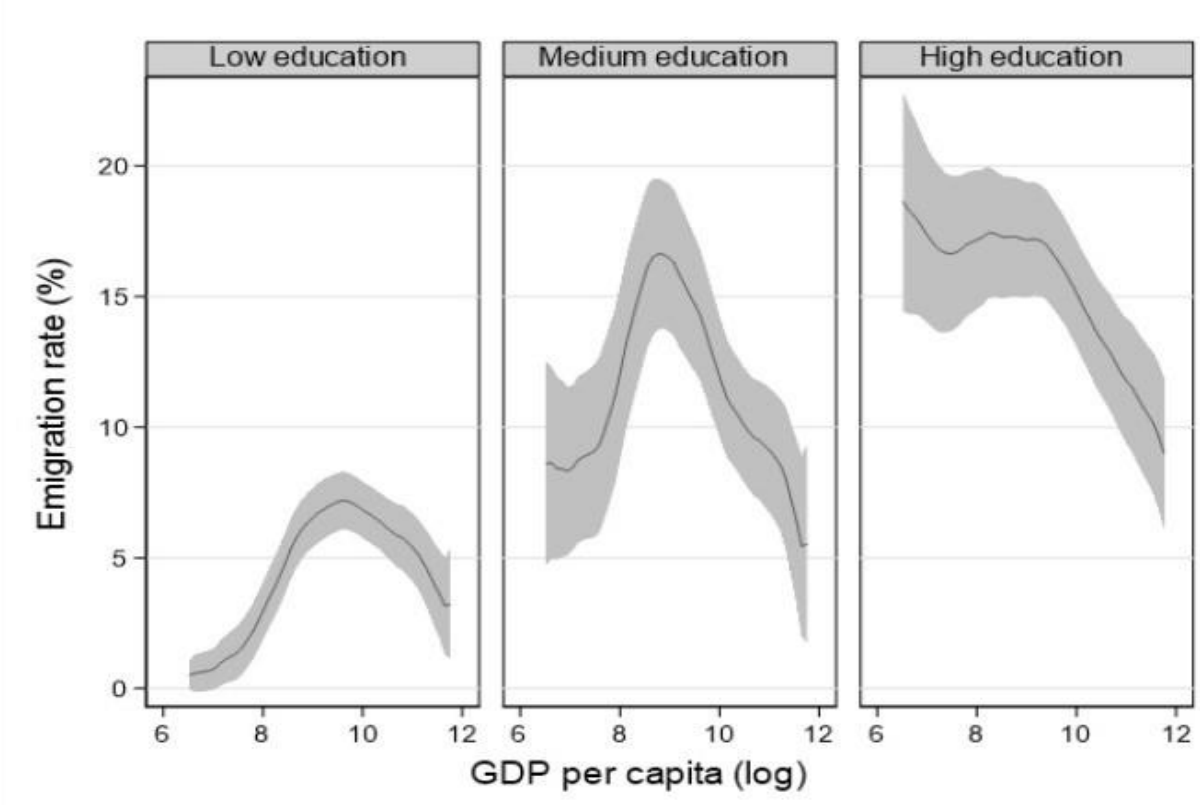



Note: The emigration rate is calculated as the ratio between the number of emigrants living in OECD countries and the total sum of the resident population and emigrants living in OECD countries.

**Source**: [180, p. 24]

**Annex 15**

**Rate of emigration based on GDP per capita by the level of educational attainment, 2015/16 (%)**

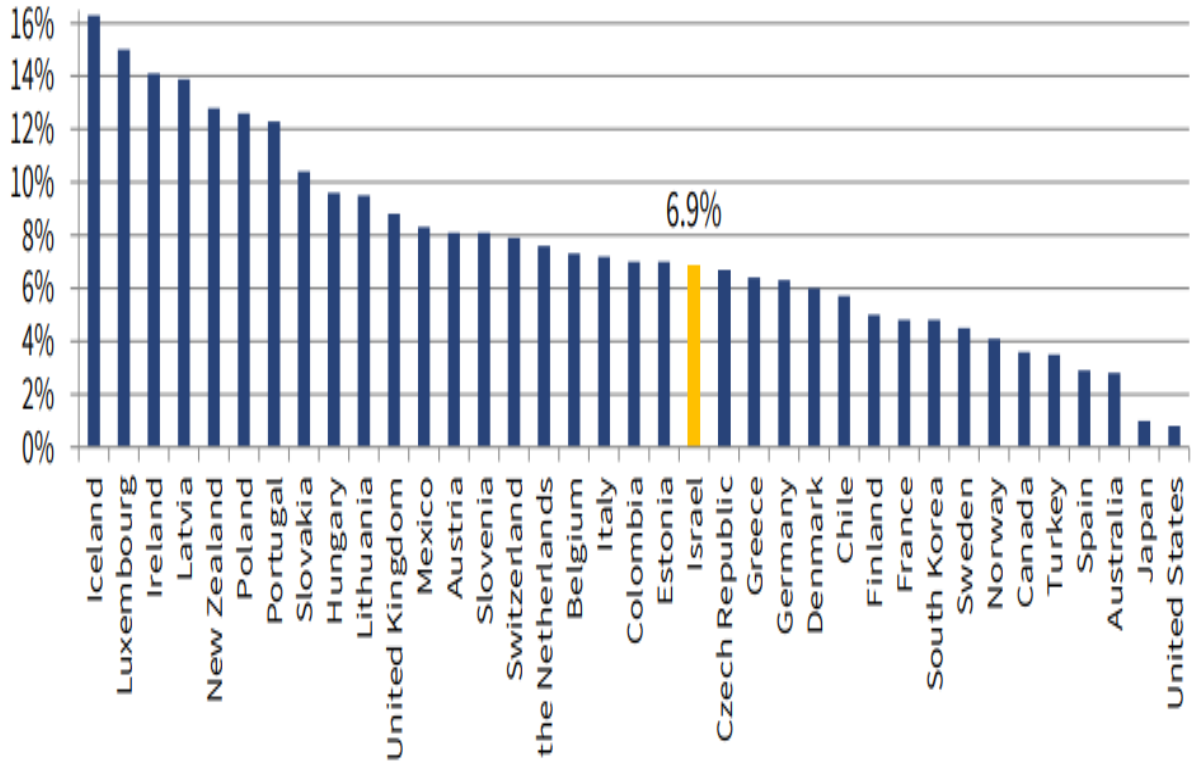



The local regression of the emigration rate on the logarithm of GDP per capita. The grey area corresponds to the 95% confidence interval.

**Source:** [180, p. 26]

**Annex 16**

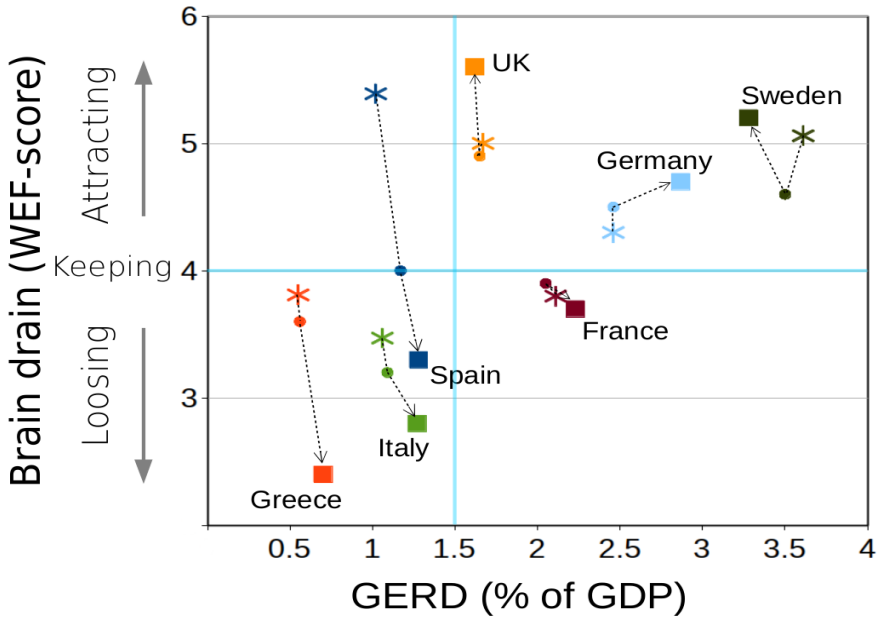
**Emigrants with Higher Education Degrees in OECD Countries, 2015/16 (%)**




**Source**: [165, p. 14]

**Annex 17**

**Brain drain parameter versus expenditure in R&D during 2003-2013 in selected European countries**




(The stars, dots and squares correspond to GERD values of 2003, 2006 and 2012, respectively.)

**Source:** [109, p. 4]

**Annex 18**

## Researchers per million inhabitants (FTE), 2015-2021

| Indicator | Researchers per million inhabitants (FTE) | | | | | | |
|---|---|---|---|---|---|---|---|
| Time | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Country** | | | | | | | |
| Argentina | 1231,48661 | 1260,70106 | 1212,45726 | 1227,40422 | 1231,51703 | 1256,26405 | 1283,79869 |
| Austria | 5074,4303 | 5401,30362 | 5416,8937 | 5683,24278 | 5959,54993 | 5829,83733 | 6341,73871 |
| Belgium | 4741,86029 | 4811,19473 | 4757,92552 | 5032,36782 | 5280,4219 | 5410,83206 | 6581,89232 |
| Bosnia and Herzegovina | 353,12317 | 406,14245 | 470,16902 | 458,03728 | 449,22435 | 443,8526 | 442,83083 |
| Bulgaria | 1939,14416 | 2198,80821 | 2092,08124 | 2310,61903 | 2391,02454 | 2377,55574 | 2339,25243 |
| Canada | 4582,37923 | 4428,17296 | 4467,15612 | 4758,10247 | 4894,20732 | 5076,24404 | .. |
| Chile | 459,82988 | 500,26783 | 499,76146 | 529,07151 | 512,46593 | 518,66667 | .. |
| China | 1164,94031 | 1210,74113 | 1237,74195 | 1319,35596 | 1485,81754 | 1601,92217 | 1687,05679 |
| China, Hong Kong Special Administrative Region | 3472,30976 | 3651,50815 | 3709,26503 | 3972,15278 | 4235,05701 | 4349,29412 | 4585,46178 |
| China, Macao Special Administrative Region | 1261,10181 | 2614,08864 | 3176,7011 | 3471,42943 | 3628,89214 | 3866,36797 | 4131,50059 |
| Costa Rica | 493,01919 | 523,11853 | 378,87941 | 343,77862 | .. | 365,69417 | 399,35022 |
| Croatia | 1490,76729 | 1837,36663 | 1856,81189 | 1912,06832 | 2127,93472 | 2214,7751 | 2330,90633 |
| Cyprus | 1010,61619 | 1058,56405 | 1209,63685 | 1408,18017 | 1657,72538 | 1739,85507 | 1743,28995 |
| Czechia | 3619,29262 | 3547,21523 | 3721,12215 | 3911,20711 | 4033,88589 | 4194,94528 | 4568,60692 |
| Denmark | 7561,01682 | 7873,96871 | 7683,44205 | 7635,77738 | 7727,23923 | 7667,30376 | 7707,72522 |
| Egypt | 643,47651 | 659,06477 | 647,85695 | 657,59182 | 791,01117 | 804,91071 | 821,7045 |
| El Salvador | 64,29578 | 66,97769 | 65,01456 | 72,8499 | 75,00583 | .. | .. |
| Estonia | 3188,26123 | 3296,20731 | 3552,23048 | 3765,62187 | 3769,83693 | 3835,71868 | 4038,19516 |
| Finland | 6856,33475 | 6543,96586 | 6731,79223 | 6872,98388 | 7246,27201 | 7548,50264 | 7870,6534 |
| France | 4386,23641 | 4467,42812 | 4624,69676 | 4756,58412 | 4870,45612 | 4986,1801 | 5175,00557 |
| Georgia | 1366,20434 | 1391,42457 | 1389,60565 | 1553,30612 | 1799,87186 | 1812,39011 | 1717,37086 |
| Germany | 4733,35858 | 4862,6252 | 5087,25427 | 5239,97188 | 5428,21538 | 5413,82418 | 5535,95429 |
| Greece | 3202,90399 | 2728,34421 | 3264,14594 | 3441,0649 | 3684,86922 | 4073,54743 | 4326,3066 |
| Guatemala | 22,70032 | 22,67179 | 14,47812 | 13,27843 | 14,95745 | 17,29424 | 14,51904 |
| Honduras | 22,14679 | .. | 34,2629 | 201,23932 | 187,42656 | .. | .. |
| Hungary | 2568,34766 | 2624,60598 | 2901,01543 | 3845,49153 | 4020,57775 | 4308,95424 | 4452,15175 |
| Iceland | 5903,85334 | 6629,2432 | 6054,68115 | 5879,26569 | .. | .. | 6940,41702 |
| Iraq | 62,82107 | 61,98544 | 101,61423 | 106,5256 | 117,28555 | 135,29593 | 162,45588 |
| Ireland | 5282,94951 | 5184,71517 | 5155,37079 | 4749,61714 | 4836,0744 | 4858,6072 | 5250,68228 |
| Italy | 2087,55758 | 2222,20841 | 2336,93888 | 2541,03826 | 2688,64671 | 2632,27982 | 2677,84078 |
| Japan | 5198,09749 | 5235,15675 | 5331,27133 | 5361,96599 | 5409,53544 | 5495,25074 | 5638,41792 |
| Kazakhstan | 770,84599 | 688,84224 | 661,72592 | 662,98622 | 633,65202 | 686,17575 | 626,47176 |
| Kuwait | 404,73611 | 465,2199 | 504,9046 | 503,72785 | 175,58415 | 165,83262 | .. |
| Latvia | 1805,33736 | 1589,81469 | 1772,61368 | 1776,50389 | 1885,90386 | 2135,01786 | 2404,52392 |
| Lithuania | 2741,43842 | 2891,36342 | 2994,60998 | 3092,74534 | 3364,46717 | 3590,74721 | 3935,08527 |
| Luxembourg | 4637,83878 | 4802,84536 | 4971,16521 | 4756,47013 | 5092,30827 | 4690,30266 | 4940,60373 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Malta | | 1817,2027 | 1939,75502 | 1970,44959 | 1866,12509 | 1886,77729 | 1983,92841 | 2160,72659 |
| Mauritius | | .. | .. | .. | 463,61583 | 540,26017 | 552,95846 | 556,9283 |
| Mexico | | 286,94249 | 321,8083 | 320,14698 | 317,40691 | 335,13871 | 357,97889 | .. |
| Montenegro | | 824,98916 | 708,58413 | 696,82667 | 757,903 | 743,38011 | .. | .. |
| Myanmar | | .. | .. | 29,79052 | 33,86079 | 30,17835 | 32,55807 | 18,96736 |
| Netherlands | | 4911,12758 | 5128,77161 | 5302,34455 | 5535,47607 | 5640,24547 | 5865,72665 | 6074,31065 |
| New Zealand | | 5492,04192 | .. | 5098,76412 | .. | 5724,13122 | .. | 5102,2701 |
| North Macedonia | | 847,24243 | 842,85206 | 719,23357 | 788,03723 | 775,3953 | 775,23718 | 743,68667 |
| Norway | | 5929,21678 | 6120,12967 | 6395,43983 | 6483,52599 | 6736,85143 | 6765,33242 | 7227,93066 |
| Oman | | 222,01293 | 249,89385 | 251,47211 | 296,09371 | 382,4452 | 372,68235 | 330,34504 |
| Paraguay | | 199,22284 | 131,92398 | 147,04097 | 151,8835 | 168,95293 | 140,87852 | .. |
| Poland | | 2141,1824 | 2288,0817 | 2973,76616 | 3056,76772 | 3136,39045 | 3238,20911 | 3534,49865 |
| Portugal | | 3724,79711 | 3995,62552 | 4355,7475 | 4627,17238 | 4879,31874 | 5163,35335 | 5473,44704 |
| Republic of Korea | | 7018,35865 | 7056,34297 | 7450,5576 | 7913,5015 | 8322,58762 | 8614,63518 | 9081,93585 |
| Republic of Moldova | | 946,48296 | 912,00965 | 923,49386 | 903,41782 | 823,53362 | 774,67919 | 781,24167 |
| Romania | | 874,72788 | 908,9898 | 887,30938 | 875,76242 | 887,07363 | 940,54664 | 985,49335 |
| Russian Federation | | 3109,76327 | 2959,96583 | 2825,53951 | 2787,2464 | 2749,48531 | 2724,90717 | .. |
| Serbia | | 2060,14765 | 2121,8924 | 2067,73261 | 2075,98604 | 2087,27636 | 2149,85336 | 2206,70833 |
| Singapore | | 6977,66947 | 6897,04458 | 6777,63699 | 6786,69594 | 7275,63158 | 7224,74807 | .. |
| Slovakia | | 2656,80214 | 2607,20126 | 2801,07321 | 3001,40432 | 3114,86275 | 3165,59494 | 3211,04404 |
| Slovenia | | 3805,08157 | 3892,97227 | 4440,84494 | 4788,84668 | 4980,42048 | 5124,62599 | 5223,00015 |
| South Africa | | 473,73416 | 489,20081 | 524,14553 | 510,97357 | 491,40996 | 472,68092 | .. |
| Spain | | 2636,84759 | 2727,42868 | 2863,75013 | 3003,56286 | 3067,66122 | 3071,44816 | 3251,74281 |
| Sri Lanka | | 104,08262 | 105,03859 | 104,71218 | 104,06004 | .. | 104,55117 | .. |
| Sweden | | 6810,78998 | 7107,98056 | 7308,65913 | 7433,21055 | 7697,83607 | 7759,49884 | 8130,79112 |
| Thailand | | 847,08558 | 1183,14274 | 1320,63055 | 1718,45617 | 1749,91905 | 2023,83061 | .. |
| Togo | | 35,85397 | 31,93673 | 38,46865 | 47,6891 | 46,49953 | 45,29121 | 44,86637 |
| Trinidad and Tobago | | .. | .. | 485,81699 | 531,20922 | 449,53834 | 590,52778 | .. |
| Tunisia | | 1751,00477 | 1942,66881 | 1893,23867 | 1765,24484 | 1701,58107 | 1620,48515 | 1584,24254 |
| Türkiye | | 1205,0807 | 1246,89301 | 1369,34598 | 1530,90472 | 1629,73242 | 1786,51708 | 1999,53412 |
| Ukraine | | 1005,99722 | 1037,24086 | 994,07744 | 988,07663 | 880,55411 | 846,24846 | 587,49768 |
| United Arab Emirates | | 2066,50624 | 2490,70229 | .. | 2516,4252 | 2536,50717 | 2612,33265 | 2666,01537 |
| United States of America | | 3874,7866 | 3830,4626 | 3958,56396 | 4261,98949 | 4308,87396 | 4451,78104 | .. |
| Uruguay | | 680,01858 | 700,86007 | 716,90501 | 768,93031 | 791,29754 | 806,23731 | 808,18636 |
| Uzbekistan | | 501,23262 | 509,89434 | 499,59238 | 480,43229 | 421,46492 | 426,82076 | 525,33211 |
| Venezuela (Bolivarian Republic of) | | 246,58669 | 292,0226 | .. | .. | 230,67055 | 289,18399 | .. |
| Viet Nam | | 685,66343 | .. | 715,4071 | .. | 765,51782 | .. | 779,30847 |
| World | | 1143,08011 | 1164,61254 | 1195,1174 | 1244,70302 | 1294,48198 | 1326,85573 | 1352,49955 |
| Landlocked Developing Countries | | 162,51643 | 158,78502 | 158,15916 | 157,02849 | 164,78766 | 166,02706 | 169,34228 |
| Least Developed Countries | | 65,43619 | 67,45107 | 70,28555 | 72,01722 | 72,63639 | 73,21338 | 72,47363 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Small Island Developing States | | 801,67002 | 831,54331 | 824,98939 | 831,76129 | 875,01595 | 899,32435 | 896,93722 |
| Sub-Saharan Africa | | 93,6587 | 95,63452 | 99,07435 | 98,90001 | 97,98225 | 96,40406 | 95,68491 |
| Northern Africa and Western Asia | | 800,77462 | 827,05696 | 848,00944 | 871,41144 | 925,13991 | 950,42232 | 1005,26919 |
| Northern Africa | | 686,20037 | 714,26756 | 714,65917 | 710,3854 | 762,48852 | 762,88415 | 766,75351 |
| Western Asia | | 899,49538 | 924,44124 | 963,44066 | 1011,50598 | 1066,91751 | 1114,19897 | 1215,38326 |
| Central and Southern Asia | | 235,38376 | 259,75119 | 284,08643 | 298,83612 | 307,60152 | 313,81061 | 317,06809 |
| Central Asia | | 501,49164 | 481,14119 | 465,84162 | 458,58299 | 424,85232 | 442,38405 | 471,52427 |
| Southern Asia | | 225,52134 | 251,50944 | 277,29272 | 292,84363 | 303,18463 | 308,94516 | 311,19348 |
| Eastern and South-Eastern Asia | | 1397,8889 | 1442,08631 | 1479,83792 | 1554,95594 | 1682,00999 | 1762,23808 | 1821,08458 |
| Eastern Asia | | 1696,6876 | 1742,15512 | 1784,70414 | 1872,64045 | 2034,14384 | 2149,93653 | 2249,9251 |
| South-Eastern Asia | | 667,86818 | 713,19901 | 743,26361 | 791,29329 | 841,03435 | 842,74151 | 812,07631 |
| Latin America and the Caribbean | | 529,46823 | 575,76925 | 583,63985 | 605,13041 | 608,8138 | 623,47127 | 625,35588 |
| Oceania | | 3546,9074 | 3456,98512 | 3421,9255 | 3445,07712 | 3441,25398 | 3367,78399 | 3324,46003 |
| Australia and New Zealand | | 4976,42911 | 4856,40059 | 4812,07203 | 4850,1384 | 4848,78832 | 4746,72045 | 4695,85642 |
| Europe and Northern America | | 3523,38273 | 3536,44671 | 3643,60585 | 3816,5247 | 3896,47142 | 3971,22555 | 4049,7192 |
| Europe | | 3319,84586 | 3364,81231 | 3464,79641 | 3572,60203 | 3662,84499 | 3700,01547 | 3816,56734 |
| Northern America | | 3943,76038 | 3888,67315 | 4008,06111 | 4310,37676 | 4366,53201 | 4513,68419 | 4513,88898 |
| World | | 1143,08011 | 1164,61254 | 1195,1174 | 1244,70302 | 1294,48198 | 1326,85573 | 1352,49955 |
| Arab States | | 538,04291 | 564,964 | 569,15745 | 567,39362 | 599,67075 | 601,92507 | 629,79235 |
| Central and Eastern Europe | | 2101,18705 | 2083,19801 | 2134,5507 | 2200,20097 | 2219,27529 | 2266,2489 | 2332,30779 |
| Central Asia | | 632,00756 | 606,66233 | 585,47429 | 580,41054 | 628,26189 | 641,50829 | 662,43347 |
| East Asia and the Pacific | | 1436,64882 | 1479,00023 | 1515,86346 | 1590,51329 | 1715,81471 | 1793,7816 | 1851,08244 |
| Latin America and the Caribbean | | 529,48329 | 575,77973 | 583,65112 | 605,14232 | 608,82277 | 623,4793 | 625,3635 |
| North America and Western Europe | | 4069,77708 | 4097,89816 | 4230,15237 | 4451,29541 | 4559,51401 | 4651,79884 | 4745,77224 |
| South and West Asia | | 225,52134 | 251,50944 | 277,29272 | 292,84363 | 303,18463 | 308,94516 | 311,19348 |
| Sub-Saharan Africa | | 92,83121 | 94,74362 | 97,98991 | 97,60634 | 96,68346 | 95,0988 | 94,37717 |
| Small Island Developing States | | 833,93938 | 865,02168 | 857,13231 | 863,48188 | 908,88323 | 934,19939 | 931,17145 |
| Low income countries | | 158,56041 | 165,19514 | 170,43873 | 174,51142 | 176,76931 | 176,03152 | 176,19841 |

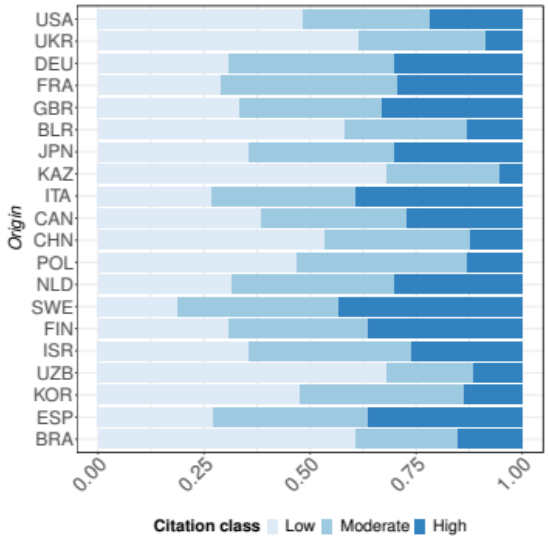
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Lower middle income countries | | 261,96931 | 282,35026 | 298,89992 | 309,5275 | 318,34449 | 321,51138 | 322,50614 |
| Middle income countries | | 630,22387 | 656,43771 | 671,92402 | 703,62153 | 752,65724 | 782,40826 | 798,10677 |
| Upper middle income countries | | 1021,20731 | 1056,44277 | 1073,73363 | 1131,23596 | 1227,75776 | 1290,77707 | 1327,73922 |
| High income countries | | 3980,89285 | 4012,11356 | 4150,19862 | 4332,22794 | 4435,99109 | 4525,29044 | 4650,31329 |

Source: [152, p. 13]

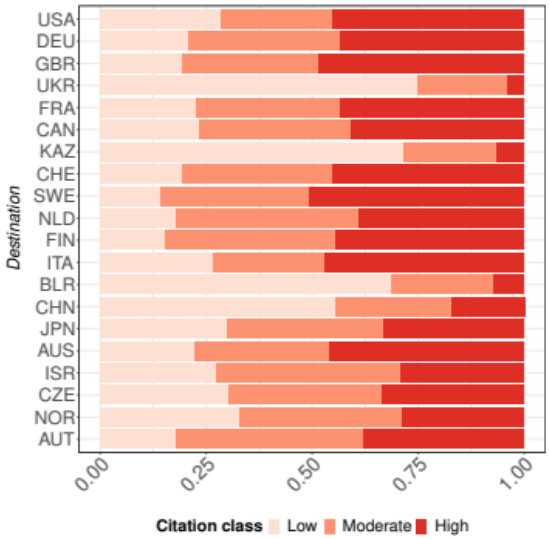
**Annex 19**

**Brain Drain and Brain Gain in Russia, 2020**

**A19.1 The composition of the top 20 origins most sought after by immigrants (a), and the composition of the top 20 destinations most sought after by emigrants, by citation class**



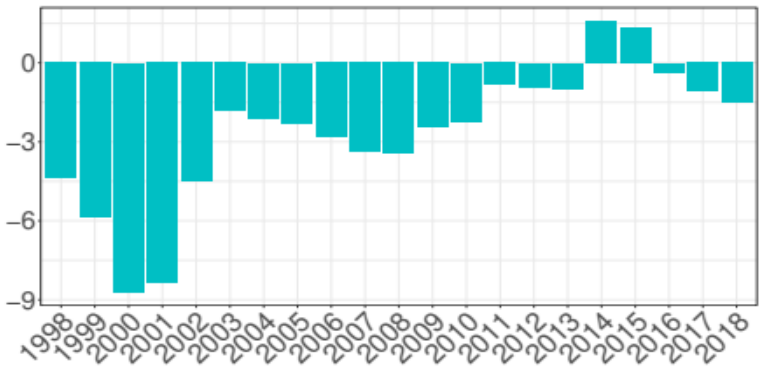

(a) Composition of origin countries for immigrants by citation class



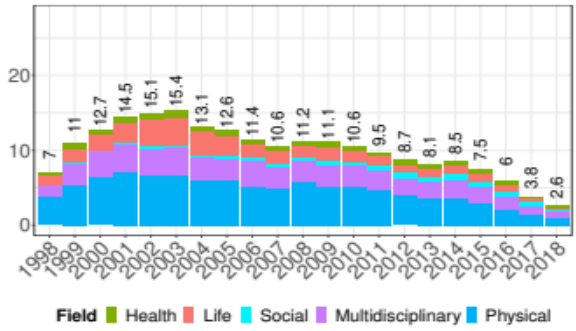

(b) Composition of destination countries for emigrants by citation class

Source: [152, p. 13]

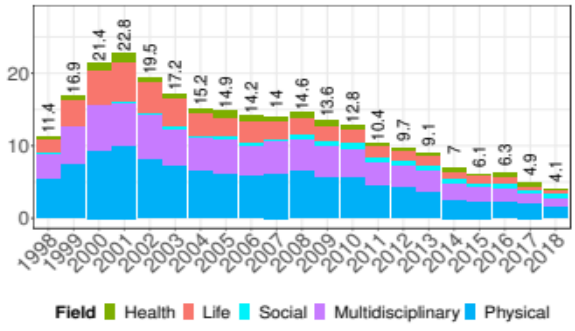
**A19.2 The net migration (a), in-migration (b), and out-migration (c) rates per 1,000 researchers in Russia in specific fields over the 1998-2018 period**



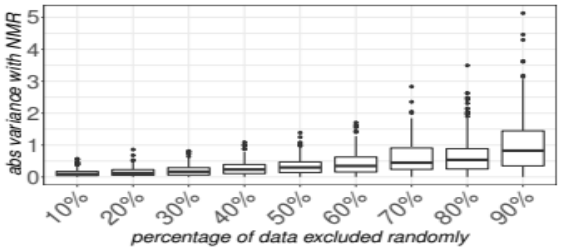
(a) Net migration rate



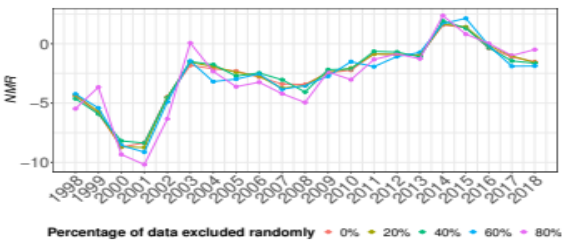

(b) In-migration rate




(c) Out-migration rate




(a) Boxplot of absolute variance of NMR in different scenarios of randomly excluding data



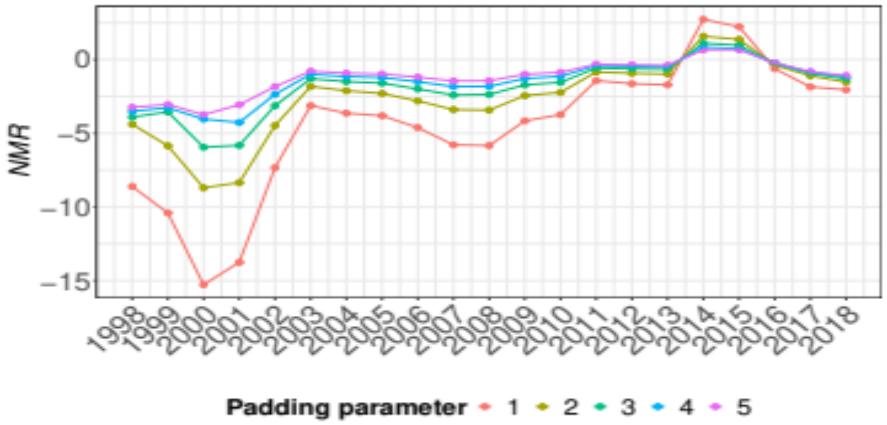

(b) Net migration rates for different scenarios of randomly excluding data

(Sensitivity analysis of net migration rates over the 1998-2018 period showing fairly stable results even when the majority of the data are excluded.)

**Source:** [152, p. 15, p. 18]

**Annex 20**

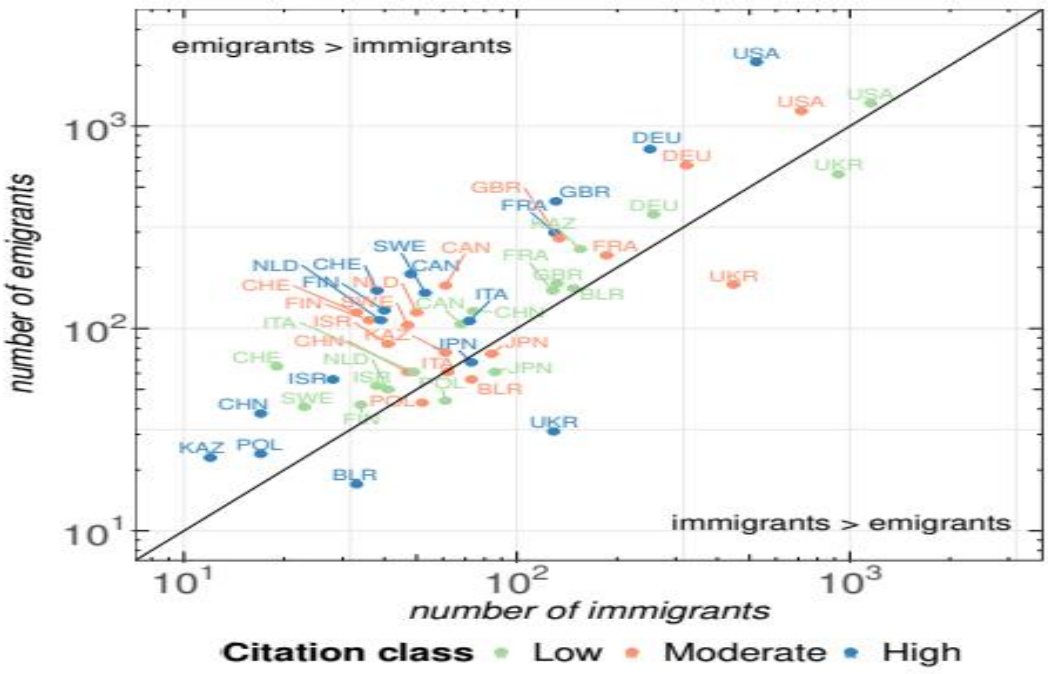
**Net calculated migration rates, based on different scenarios for a population of scholars in Russia over the 1998-2018 period**




**Source:** [152, p. 18]

**Annex 21**

**Scatter plot of the number of emigrants by the number of immigrants for each combination of citation class and country. x and y axes are on a logarithmic scale, 2020**




**Source**: [152, p.13]

**Annex 22**

**Distribution of labor migrants by field of education and country of destination, %**

| | Poland | | Germany | | Great Britain | | France | | Israel | | Spain | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | men | women | men | women | men | women | men | women | men | women | Men | women |
| Learning/ Education | 2 | 5 | 3 | 19 | 8 | 3 | - | 11 | 11 | 11 | 2 | 23 |
| Justice/Law | - | - | 7 | 10 | 5 | 3 | 2 | 7 | 3 | 1 | 13 | 7 |
| Technologies Information and Communication | 8 | 3 | 8 | 2 | 5 | 3 | 9 | 7 | 3 | 1 | 6 | 2 |
| Engineering and Construction | 10 | 3 | 19 | 2 | 16 | 13 | 16 | 9 | 31 | 7 | 23 | 4 |
| Agriculture | 3 | - | 3 | 3 | 5 | 3 | 7 | | 8 | 13 | 4 | 2 |
| Health and social care | - | 8 | 4 | 23 | - | 6 | 2 | 7 | - | 11 | - | 7 |
| Transport | 9 | - | 4 | - | 5 | - | 7 | - | 4 | 1 | 11 | - |
| Trade | 3 | 5 | 3 | 5 | 3 | 9 | - | 4 | 1 | 8 | 2 | 4 |
| Economy and finance | - | 6 | 10 | 19 | 17 | 22 | 7 | 24 | 3 | 3 | 4 | 18 |
| Social sciences | 1 | - | 4 | 5 | 5 | 9 | 2 | 2 | 1 | 2 | 2 | 7 |
| without specialty | 55 | 56 | 22 | 5 | 17 | - | 39 | 7 | 32 | 27 | 26 | 9 |
| Other | 8 | 14 | 14 | 8 | 12 | 28 | 9 | 24 | 3 | 14 | 6 | 19 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Source:** [210]

**Annex 23**

**International programs operated in Israel– Erasmus +, Tempus About Erasmus + 2022-2027 programme- Erasmus + Programme Guide**

**Projects**

Capacity Building Projects led to dozens of new courses and changed the way of teaching & learning in Israel

Read more ›


**Erasmus+ Impact**

Erasmus+ programme opened the doors and changed the lives of thousands of individuals

Read more ›


**Mobility Facts & Figures**

Erasmus+ Mobility is a game changer for the Higher Education sector in Israel

Read more ›


**Source:** [185]

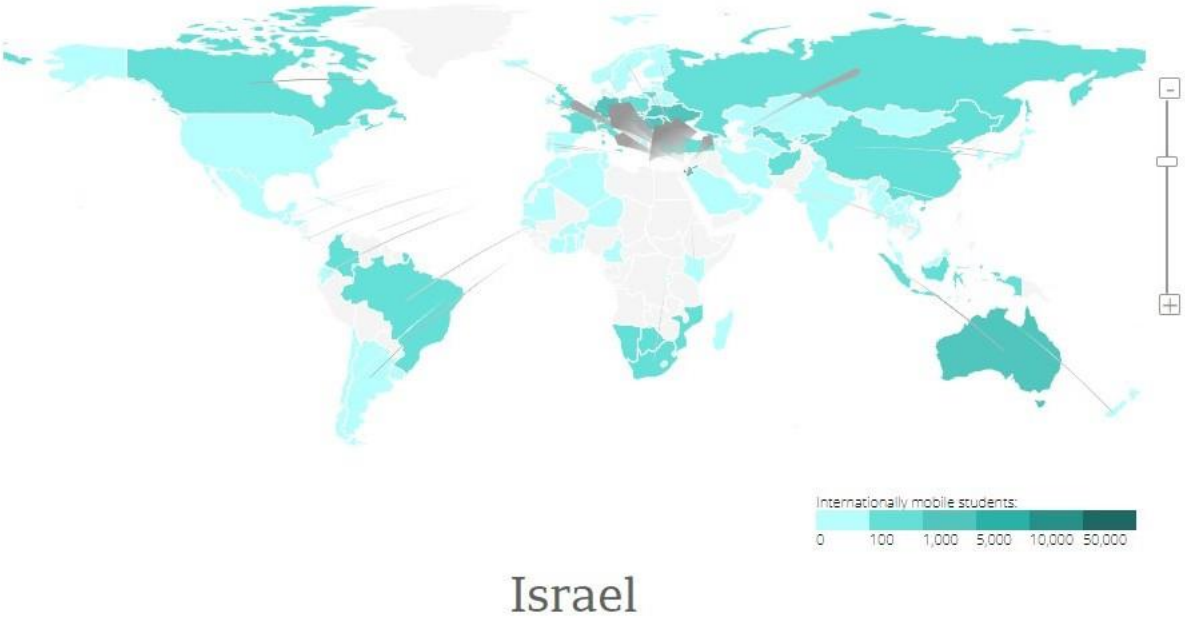
**Annex 24**

**Israel**

**Global Flow of Tertiary-Level Students, 2022**

**Where do students go to study? Where do they come from?**

UIS data on the mobility of students shed light on the shifting demand for higher education, particularly in the developing world.




**Source:** [232]

**Annex 25**

**The topics and faculties most sought after by Israeli students, by countries (2016 – 2019)**

| Country | The most demanded topics and faculties | The language of study | Admission requirements for studies | Tuitions fees | The average costs of living are: |
|---|---|---|---|---|---|
| **United state** | Business administration, Engineering, arts, Sciences, Mathematics | English | ACT test, Language test, High-school diploma, Recommendations, Writing an essay | 10,000- 55,000 USD according to the institution | 1000-2000 USD for a month. |
| **Germany** | Science, engineering, medicine | German | High school diploma | 1,200 EUR per year | 1200-2600 EUR for month |
| **Canada** | Business administration, arts and fashion design, sciences, and computer engineering. | English French | High school diploma language test | 16,000 USD for a year | 1,600-2,600 USD for month |
| **Italy** | Medicine, art, fashion design, and architecture | Italian, English | High school diploma | 1,100 EUR for a year | 700 - 1,200 EUR for month |
| **Hungary** | Veterinary, medicine, pharmacy | English, Hungarian | High school diploma medical school entrance exam | 14,500-16,500 USD for a year | 700 – 1,000 EUR for month |
| **Moldova** | Medicine, Dentistry, Pharmacy | English | High school diploma, language test, and admission test | 2000-3000 US $ per year | 600 – 1000 USD for month |
| **Russia** | Medicine, Dentistry, Pharmacy, Science | English, Russian | High school diploma, language test, and admission test | 2000-3000 US $ per year | 700 – 1400 USD for month |
| **Jordan** | medicine, software engineering, law, dentistry, and nursing | English | High school diploma, language test, and admission test | 16000-32000 US $ per year | 800 – 1000 USD for month |
| **The Palestinian Authority** | Medicine, Dentistry, Nursing, Pharmacy, Engineering, and other fields | English | High school diploma, language test, Admission test | 15000-28000 US $ | 500 – 800 USD for month |

Source: Made by the author from source [200, 206, 210]

**Annex 26**

**Israel- Students at institutions of higher education, by degree and type of institution, 1969-2020**

TABLE 2.1.- STUDENTS AT INSTITUTIONS OF HIGHER EDUCATION, BY DEGREE AND TYPE OF INSTITUTION(1) טים במוסדות להשכלה גבוהה, לפי תואר וסוג נ

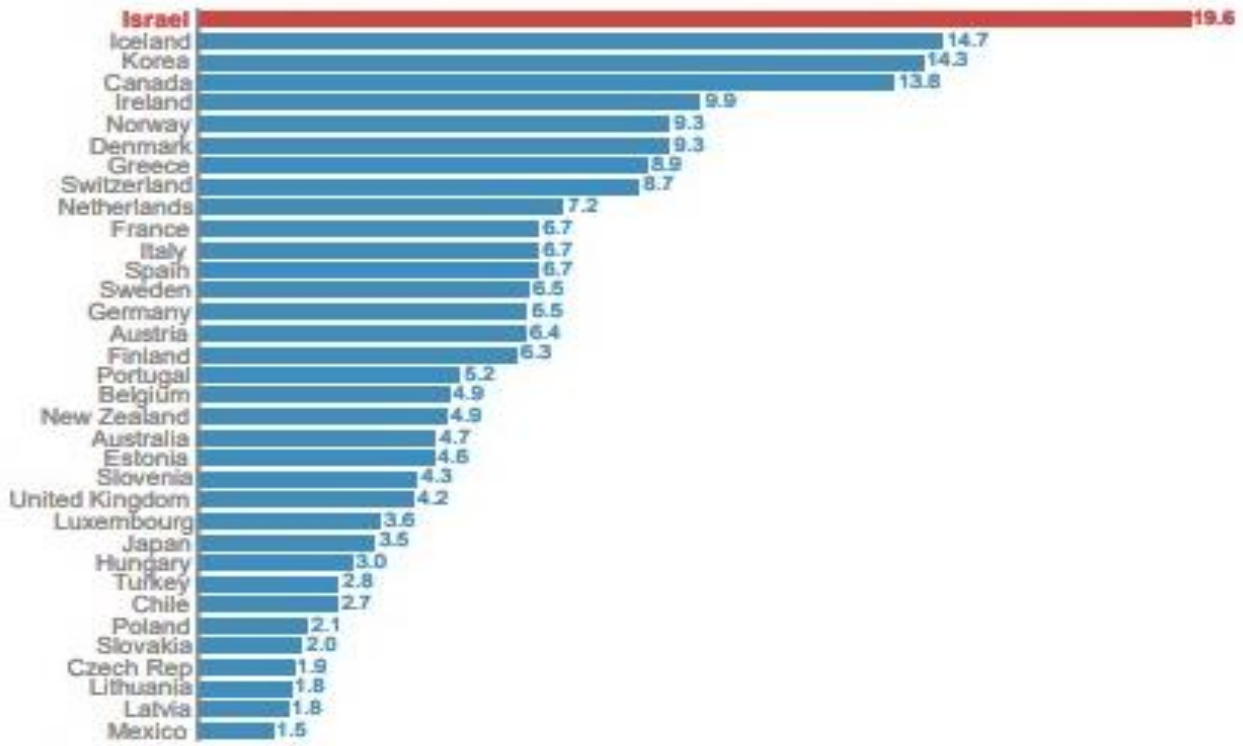
| Degree | אחוז שינוי שנתי תש"ף תש"ע (4)(3)(2) Annual percentage of change 2019/20 2009/10 | תש"ף (7) 2019/20 | תשע"ט (6) 2018/19 | תשע"ח 2017/18 | תשע"ז (5) 2016/17 | תשע"ו 2015/16 | תשע"ה 2014/15 | תשע"ד (3) 2013/14 | תשע"ג (2) 2012/13 | תשע"ב 2011/12 | תשע"א 2010/11 | תש"ע 2009/10 | תשס"ט 2008/09 | תשס"ח 2007/08 | תשס"ז 2006/07 | תש"ס 1999/00 | תשנ"ה 1994/95 | תש"ן 1989/90 | תש"ם 1979/80 | תש"ל 1969/70 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL | | | | | | | | | | | | | | | | | | | סך הכל |
| GRAND TOTAL | 1.3 | 278,504 | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | 75,487 | 53,355 | 35,374 |
| First degree | 0.7 | 197,546 | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | 92,503 | 54,805 | 39,549 | 28,053 |
| Thereof: First year | 1.3 | 62,518 | 59,273 | 57,974 | 60,015 | 59,062 | 57,951 | 56,768 | 60,120 | 58,147 | 55,548 | 55,045 | 53,991 | 52,044 | 52,037 | 39,005 | 27,813 | 16,854 | 12,678 | 9,854 |
| Thereof: New students | 1.0 | 56,229 | 53,732 | 50,159 | 53,214 | 53,520 | 53,043 | 52,115 | 52,429 | 53,629 | 50,576 | 51,044 | 49,745 | 46,407 | 46,177 | 37,982 | | | | |
| Second degree | 2.6 | 61,044 | 61,014 | 60,356 | 60,147 | 58,303 | 56,263 | 54,738 | 54,465 | 52,698 | 50,759 | 47,237 | 43,184 | 40,827 | 38,930 | 30,913 | 23,477 | 16,155 | 9,961 | 5,156 |
| Third degree(7) | 1.2 | 11,963 | 11,987 | 11,571 | 11,180 | 11,018 | 10,966 | 10,719 | 10,655 | 10,615 | 10,590 | 10,567 | 10,272 | 10,156 | 9,972 | 6,647 | 5,401 | 3,764 | 2,904 | 1,346 |
| Diploma(5)(6) | 20.8 | 7,951 | 8,105 | 1,473 | 1,779 | 1,423 | 1,409 | 1,423 | 1,214 | 1,251 | 1,206 | 1,203 | 984 | 1,136 | 1,290 | 1,692 | 1,454 | 763 | 941 | 819 |
| | UNIVERSITIES(3) | | | | | | | | | | | | | | | | | | | אוניברסיטאות(3) |
| TOTAL | 0.3 | 127,783 | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | ###### | 96,834 | 67,201 | 53,355 | 35,374 |
| First degree | 0.1 | 76,278 | 74,385 | 74,748 | 76,648 | 78,610 | 80,840 | 82,519 | 74,000 | 74,608 | 74,923 | 75,271 | 75,437 | 75,635 | 76,155 | 74,194 | 66,502 | 46,519 | 39,549 | 28,053 |
| Thereof: First year | 0.4 | 24,078 | 22,191 | 22,200 | 24,013 | 23,557 | 23,882 | 24,689 | 22,767 | 23,141 | 23,060 | 23,121 | 23,663 | 23,456 | 24,294 | 22,010 | 21,645 | 14,245 | 12,678 | 9,854 |
| Thereof: New students | 0.3 | 20,819 | 19,332 | 18,225 | 19,326 | 19,269 | 20,297 | 20,985 | 19,156 | 19,849 | 19,761 | 20,196 | 20,419 | 19,776 | 20,780 | 19,653 | | | | |
| Second degree | 0.4 | 38,603 | 38,148 | 38,268 | 39,040 | 38,778 | 38,849 | 39,525 | 39,088 | 39,072 | 38,340 | 36,923 | 34,336 | 33,885 | 33,817 | 30,454 | 23,477 | 16,155 | 9,961 | 5,156 |
| Third degree | 1.2 | 11,958 | 11,987 | 11,571 | 11,180 | 11,018 | 10,966 | 10,719 | 10,655 | 10,615 | 10,590 | 10,567 | 10,272 | 10,156 | 9,972 | 6,647 | 5,401 | 3,764 | 2,904 | 1,346 |
| Diploma | -2.4 | 944 | 1,055 | 1,040 | 1,314 | 1,423 | 1,409 | 1,423 | 1,214 | 1,251 | 1,206 | 1,203 | 984 | 1,136 | 1,290 | 1,692 | 1,454 | 763 | 941 | 819 |
| | ACADEMIC COLLEGES - TOTAL (2)(3)(7) | | | | | | | | | | | | | | | | | | | מכללות אקדמיות - סך הכל(2)(3)(7) |
| TOTAL | 1.8 | ####### | ###### | ###### | ###### | ###### | 97,947 | 96,927 | ###### | ###### | 96,727 | 91,569 | 84,787 | 76,699 | 70,046 | 33,709 | 9,275 | 3,668 | .. | - |
| First degree | 1.3 | 94,742 | 92,044 | 90,120 | 88,916 | 89,944 | 86,273 | 86,377 | 94,515 | 91,666 | 87,409 | 83,371 | 77,526 | 71,159 | 65,926 | 33,250 | 9,275 | 3,668 | .. | - |
| Thereof: First year | 1.5 | 30,673 | 29,260 | 27,912 | 27,844 | 28,097 | 27,269 | 25,543 | 30,677 | 28,688 | 26,646 | 26,384 | 25,472 | 23,261 | 22,685 | 11,806 | 2,985 | 1,263 | .. | - |
| Thereof: New students | 1.6 | 27,941 | 26,817 | 24,237 | 25,536 | 25,567 | 23,802 | 23,324 | 25,282 | 25,693 | 23,718 | 23,785 | 23,242 | 20,676 | 19,456 | 11,508 | | | | |
| Second degree | 5.9 | 14,515 | 15,089 | 14,463 | 13,955 | 12,977 | 11,674 | 10,550 | 11,364 | 10,156 | 9,318 | 8,198 | 7,261 | 5,540 | 4,120 | 459 | - | - | - | - |
| Diploma(5) | | 235 | 323 | 433 | 465 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | BUDGETED ACADEMIC COLLEGES(2)(3) | | | | | | | | | | | | | | | | | | | מכללות אקדמיות מתוקצבות(2)(3) |
| TOTAL | | 64,313 | 62,885 | 61,066 | 58,929 | | | | | | | | | | | | | | | |
| First degree | | 59,147 | 57,939 | 56,453 | 54,890 | | | | | | | | | | | | | | | |
| Thereof: First year | | 17,999 | 17,121 | 16,848 | 16,928 | | | | | | | | | | | | | | | |
| Thereof: New students | | 16,538 | 15,724 | 14,737 | 15,678 | | | | | | | | | | | | | | | |
| Second degree | | 4,931 | 4,623 | 4,180 | 3,574 | | | | | | | | | | | | | | | |
| Diploma(5) | | 235 | 323 | 433 | 465 | | | | | | | | | | | | | | | |
| | NON-BUDGETED ACADEMIC COLLEGES(7) | | | | | | | | | | | | | | | | | | | מכללות אקדמיות לא-מתוקצבות(7) |
| TOTAL | | 45,184 | 44,571 | 43,950 | 44,407 | | | | | | | | | | | | | | | |
| First degree | | 35,595 | 34,105 | 33,667 | 34,026 | | | | | | | | | | | | | | | |
| Thereof: First year | | 12,674 | 12,139 | 11,064 | 10,916 | | | | | | | | | | | | | | | |
| Thereof: New students | | 11,403 | 11,093 | 9,500 | 9,858 | | | | | | | | | | | | | | | |
| Second degree | | 9,584 | 10,466 | 10,283 | 10,381 | | | | | | | | | | | | | | | |
| Diploma(5) | | | | | | | | | | | | | | | | | | | | |
| | ACADEMIC COLLEGES OF EDUCATION(2)(6) | | | | | | | | | | | | | | | | | | | מכללות אקדמיות לחינוך(2)(6) |
| TOTAL | 3.8 | 41,224 | 42,340 | 36,120 | 36,396 | 35,414 | 34,541 | 33,585 | 32,164 | 31,325 | 30,009 | 28,325 | 25,950 | 24,844 | 25,824 | 24,257 | 16,726 | 4,618 | .. | - |
| First degree | 0.1 | 26,526 | 27,836 | 28,495 | 29,244 | 28,866 | 28,801 | 28,922 | 28,151 | 27,855 | 26,908 | 26,209 | 24,363 | 23,442 | 24,831 | 24,257 | 16,726 | 4,618 | .. | - |
| Thereof: First year | 3.4 | 7,767 | 7,822 | 7,862 | 8,158 | 7,408 | 6,800 | 6,536 | 6,676 | 6,318 | 5,842 | 5,540 | 4,856 | 5,327 | 5,058 | 5,189 | 3,183 | 1,346 | .. | - |
| Thereof: New students | 0.6 | 7,469 | 7,583 | 7,697 | 8,352 | 8,684 | 8,944 | 7,806 | 7,991 | 8,087 | 7,097 | 7,063 | 6,084 | 5,955 | 5,941 | 6,821 | | | | |
| Thereof: Continuing stu | -6.1 | 3,273 | 3,617 | 3,517 | 3,566 | 3,804 | 4,229 | 5,110 | 5,856 | .. | .. | 6,110 | .. | .. | .. | 5,214 | 5,721 | .. | .. | - |
| Second degree | 14.1 | 7,926 | 7,777 | 7,625 | 7,152 | 6,548 | 5,740 | 4,663 | 4,013 | 3,470 | 3,101 | 2,116 | 1,587 | 1,402 | 993 | - | - | - | - | - |
| Diploma(5) | | 6,772 | 6,727 | | | | | | | | | | | | | | | | | |

**Source:** [178]

**Annex 27**

**Temporary Foreign Scholars in U.S. Universities**

(Per 100,000 population in home country, average for 2015-2017)

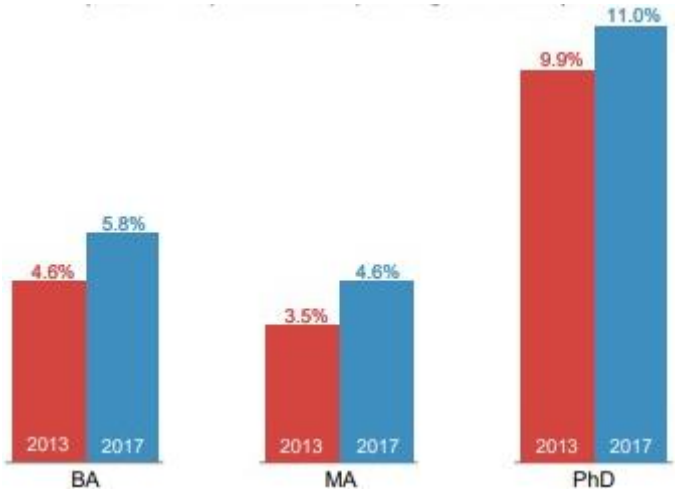



**Source:** [27, p. 14]

**Annex 28**

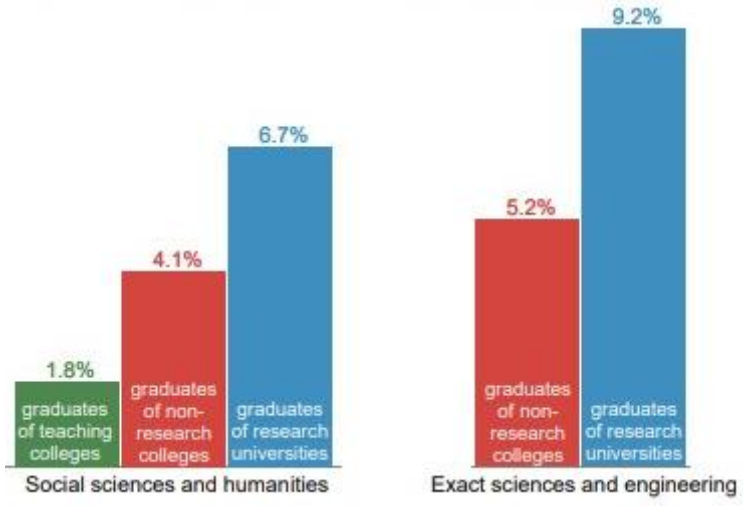
**Israeli academic emigrants, 2013 and 2017**

**A28.1** The share of Israeli graduates living abroad for at least three years, by academic degree, 2013 and 2017




**Source:** [27, p. 10]

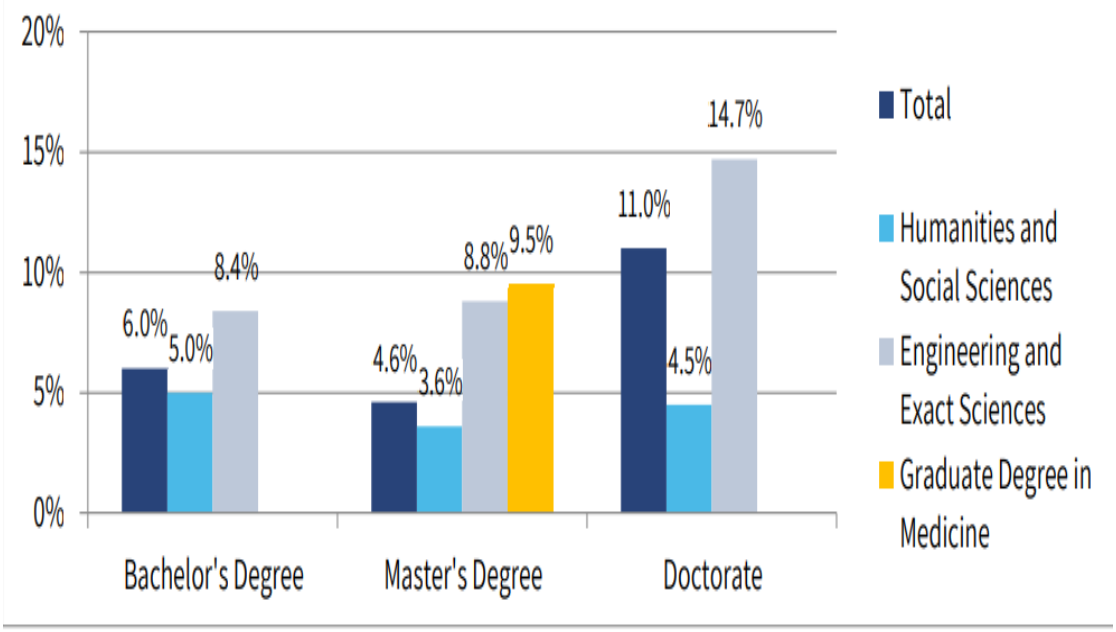
**A28.2** The share of Israeli graduates living abroad for at least three years, by type of degree-granting institution, 2017




Source: [27, p. 11]

**Annex 29**

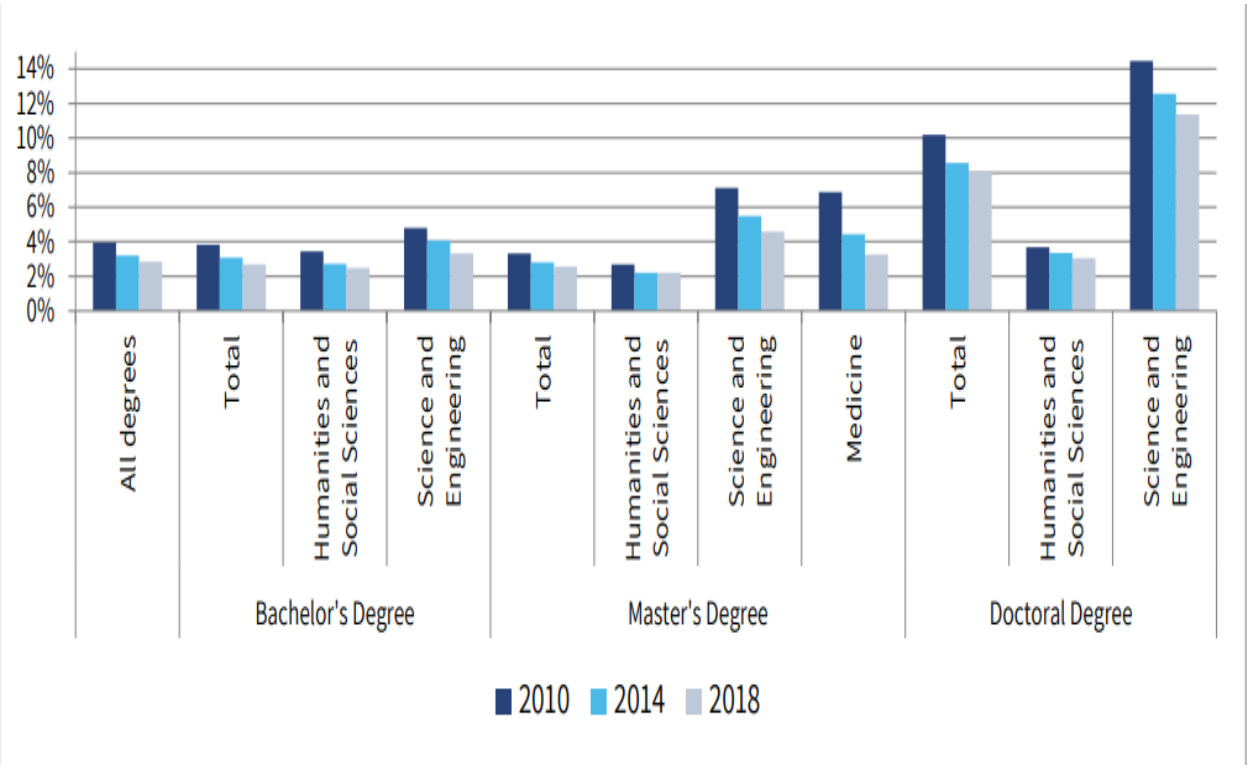
**Percentage of recipients of Israeli academic degrees between the years 1981–2012, residing abroad three or more years as of 2018, by specific fields and degree level**




**Source:** [165, p. 10]

**Annex 30**

**The number of Israeli academic degree holders residing abroad for three or more years in 2010, 2014, and 2018, from among graduates in previous years, respectively, by specific fields of study, and degree levels**




**Source: [**165, p. 25]

**Annex 31**

**Scholarships - Integration in Science Center and employer's payments (in NIS) by degree in Israel**

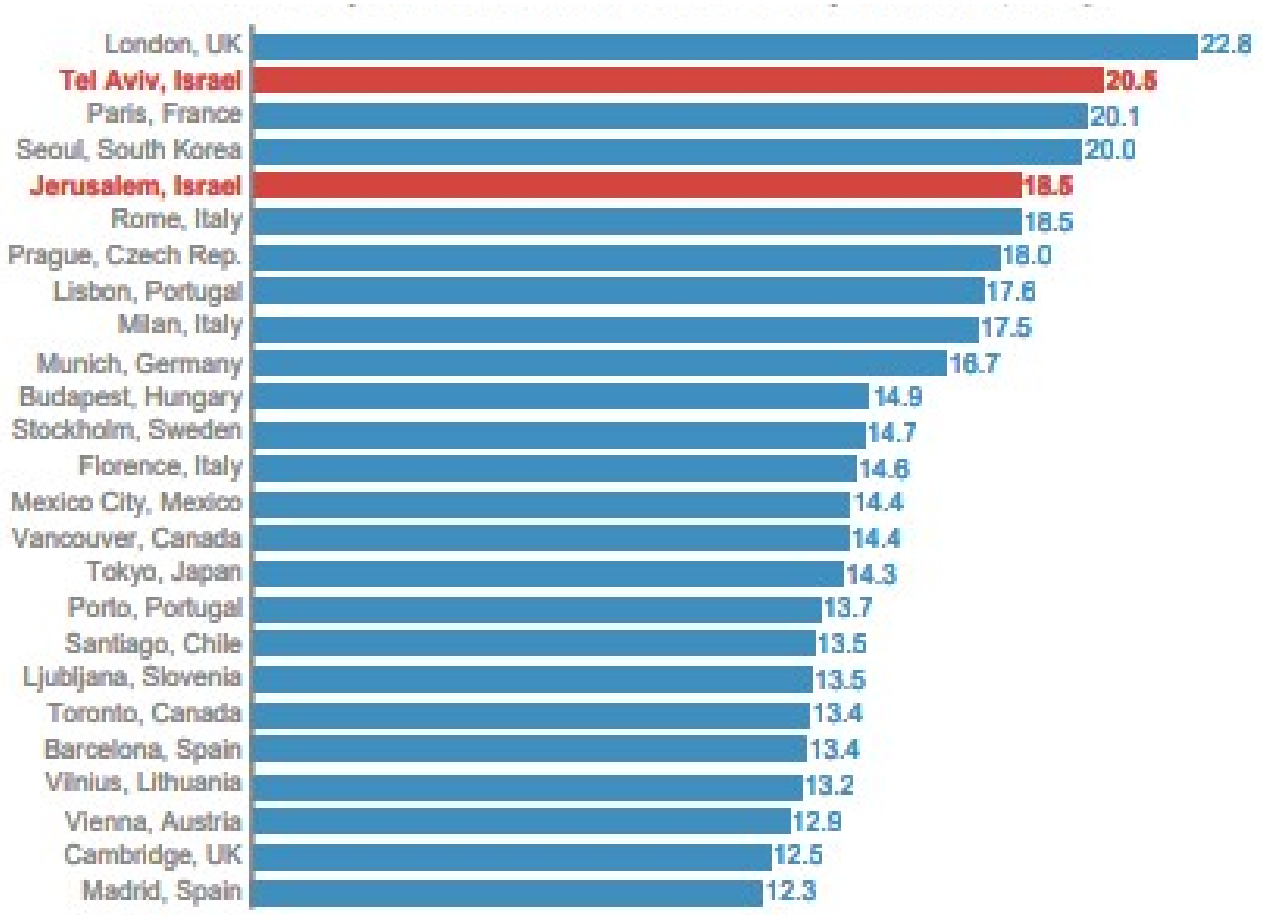
| Degree | Year 1 | Year 2 | Year 3 |
|---|---|---|---|
| **Doctoral** | 43,200 | 36,000 | 15,420 |
| Employer (annual) | 28,800 | 36,000 | 56,580 |
| **Postdoctoral** | 36,000 | 36,000 | |
| Employer | 36,000 | 36,000 | |

**Source:** [165, p. 22]

**Annex 32**

**Twenty-five most expensive cities in the OECD countries, 2019**

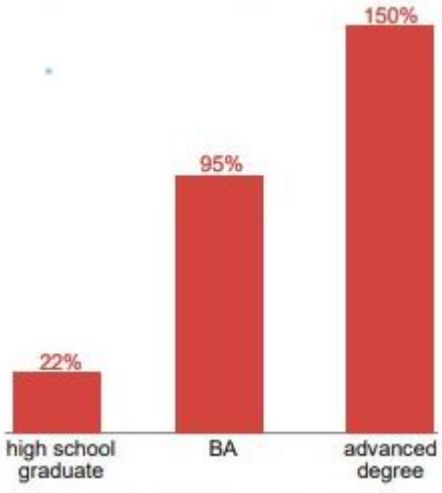
(Number of years of work needed to buy a home, 2019)




Source: [27, p. 9]

**Annex 33**

**US-Israel wage gaps according to the level of education, 2014**




It is obvious, the higher the level of education, the greater the wage gap between the US and Israel in favor of the US, especially for those with advanced degrees.

Source: [27, p. 9]

**Annex 34**

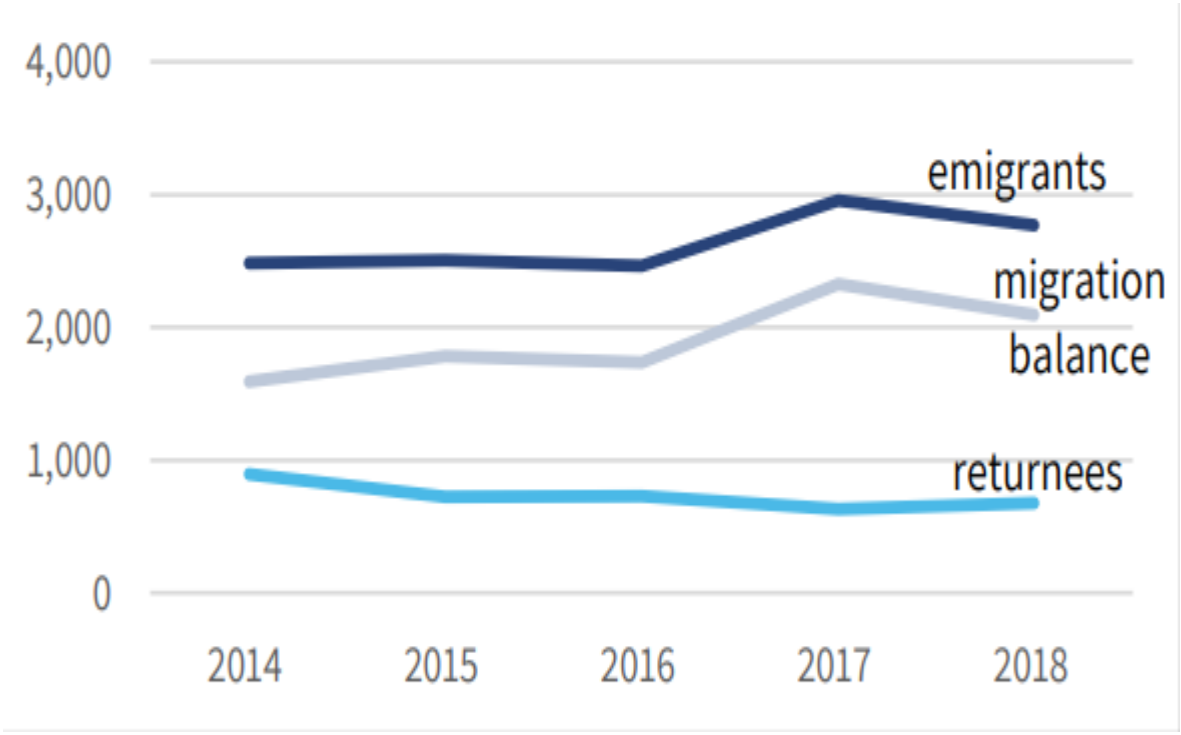
**Returning residents supported by the Integration in Science Center in Israel, 2019**

| Support type | No. Scientists | Overall Cost (thousand NIS) |
|---|---|---|
| **Employment funding** | 98 | 3,850 |
| **Research scholarships** | 18 | 650 |
| **Ministry of Defense** | 2 | |
| **Support before return** | 45 | |
| **Other** | 77 | |
| **Overall** | 240 | |

**Source:** [165, p. 24]

**Annex 35**

**The numbers of Emigrants, Returning Residents, and the Migration Balance Among Academics over the Years in Israel, 2014-2018**




**Source:** [165, p. 13]

**Annex 36**

**The amounts of assistance to the employer and the minimum salary requested from the Israeli employer by the degree of the employee, 2021**

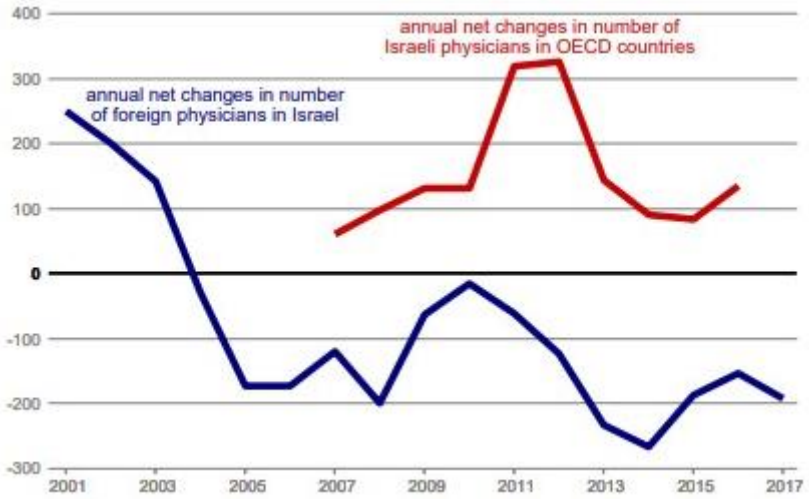
**Source:** [211]

| Degree | Year A | Year B |
|---|---|---|
| **Scientists Master's Degree** | 44,280 | 22,140 |
| Monthly Gross Minimum Salary | 6,500 | 6,500 |
| **Scientists Doctoral Degree** | 61,500 | 30,750 |
| Monthly Gross Minimum Salary | 9,000 | 9,000 |
| **Physician** | | |
| Participation of Ministry of Aliyah and Integration | 47,340 | 47,340 |
| Monthly Gross Minimum Salary | 8,500 | 8,500 |

**Annex 37**

**Migration of physicians to and from Israel**

(Annual net changes in the stocks of Israeli physicians staying in OECD countries and foreign physicians staying in Israel, 2001-2017)

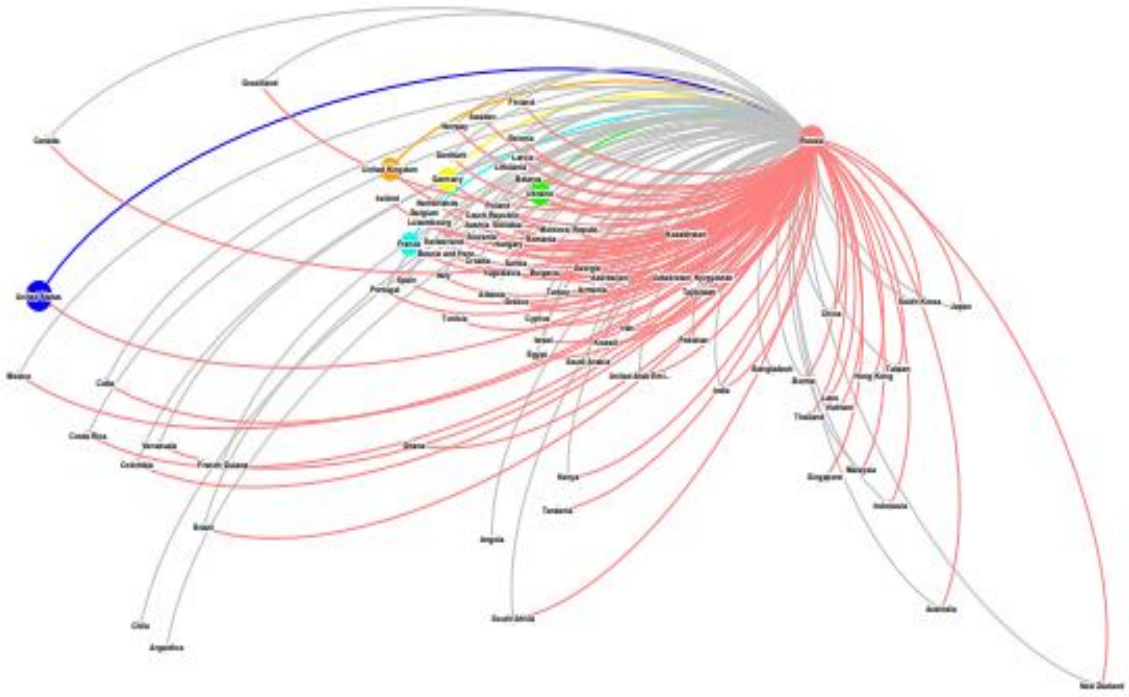



**Source:** [27, p. 13]

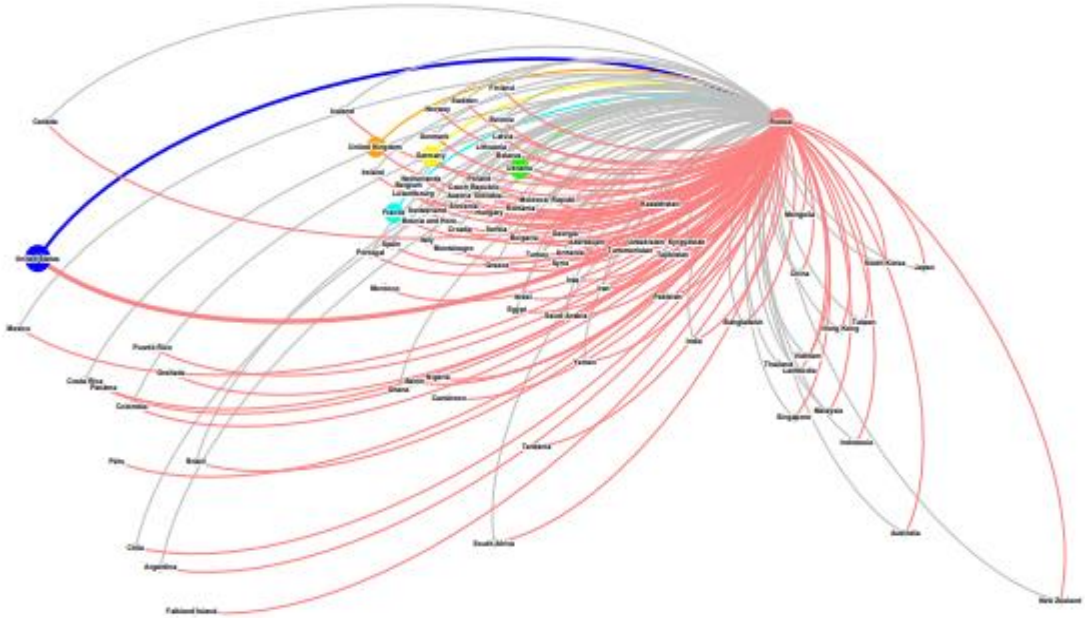
**Annex 38**

**Migration flows of researchers in four major fields in countries around the world, 2020**

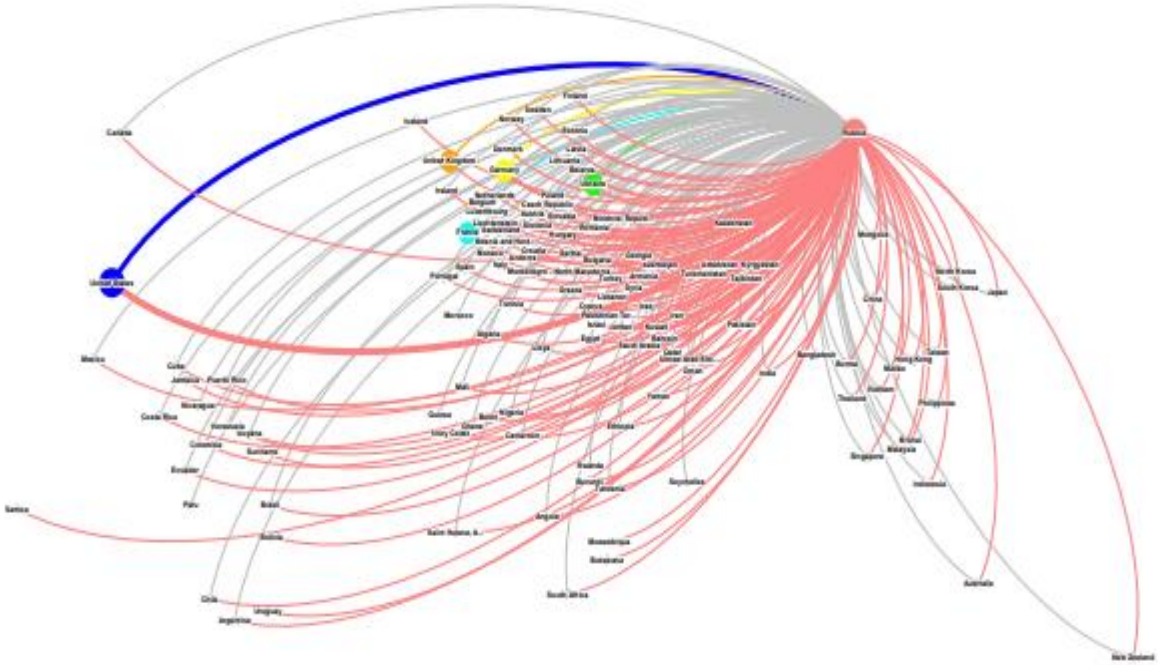
**(The colors of the flows are based on the origin country of the researcher)**



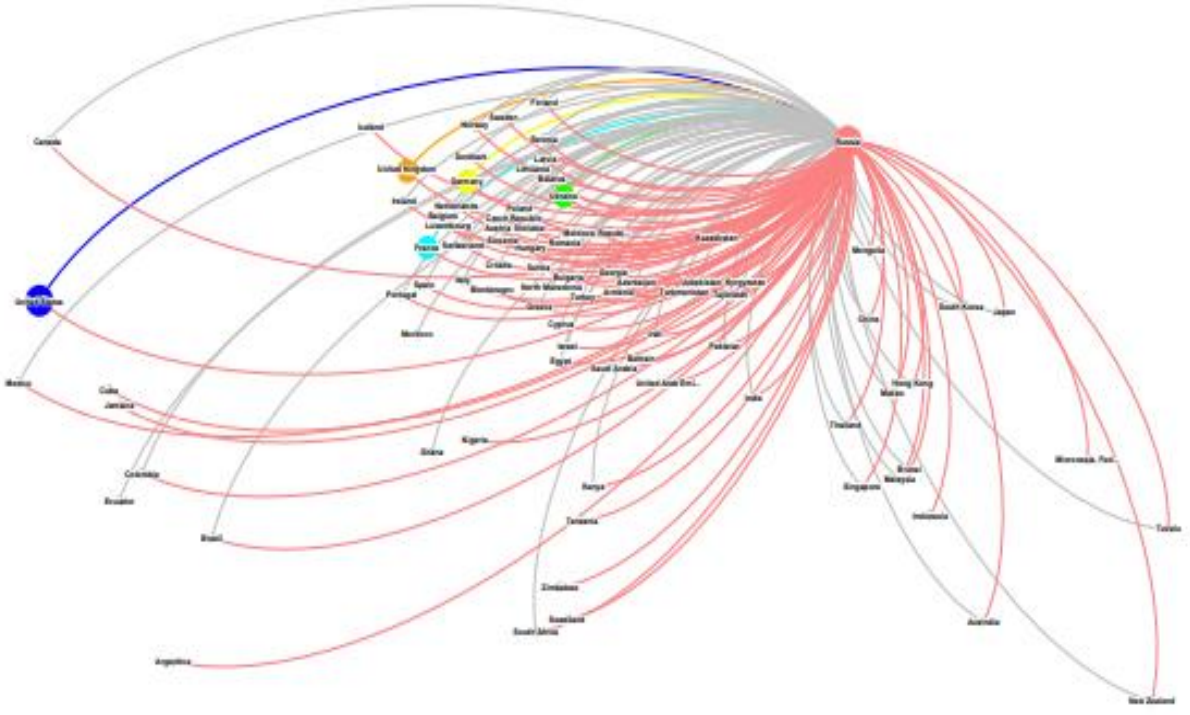
(a) Health sciences



(b) Life sciences



(c) Physical sciences

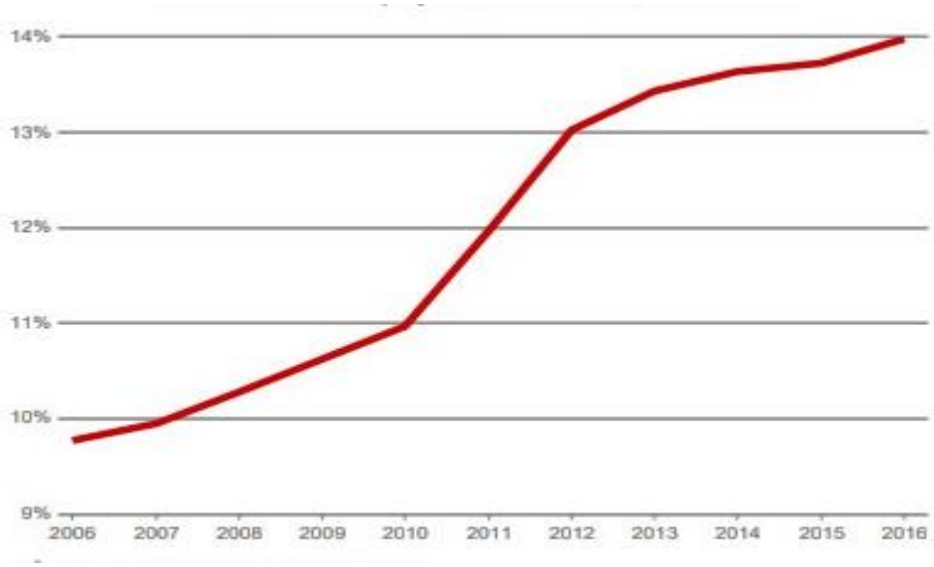


(d) Social sciences

**Source:** [152, p.12]

**Annex 39**

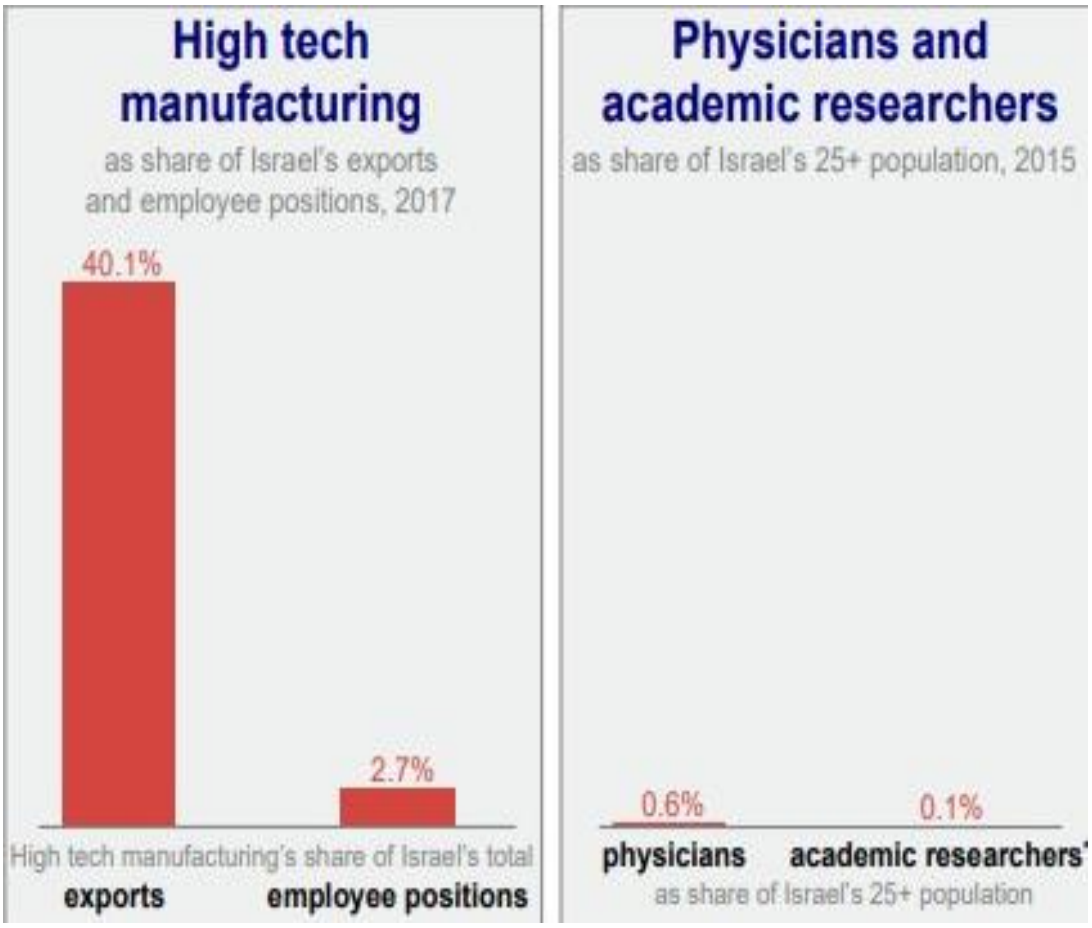
**Israeli physicians abroad- as a share of total physicians in Israel, 2006-2016**




**Source:** [27, p. 13]

**Annex 40**

**high-tech manufacturing fields as share of Israeli`s exports and employee positions, 2017 and physicians and academic researchers as share of Israeli`s 25+ population, 2015**

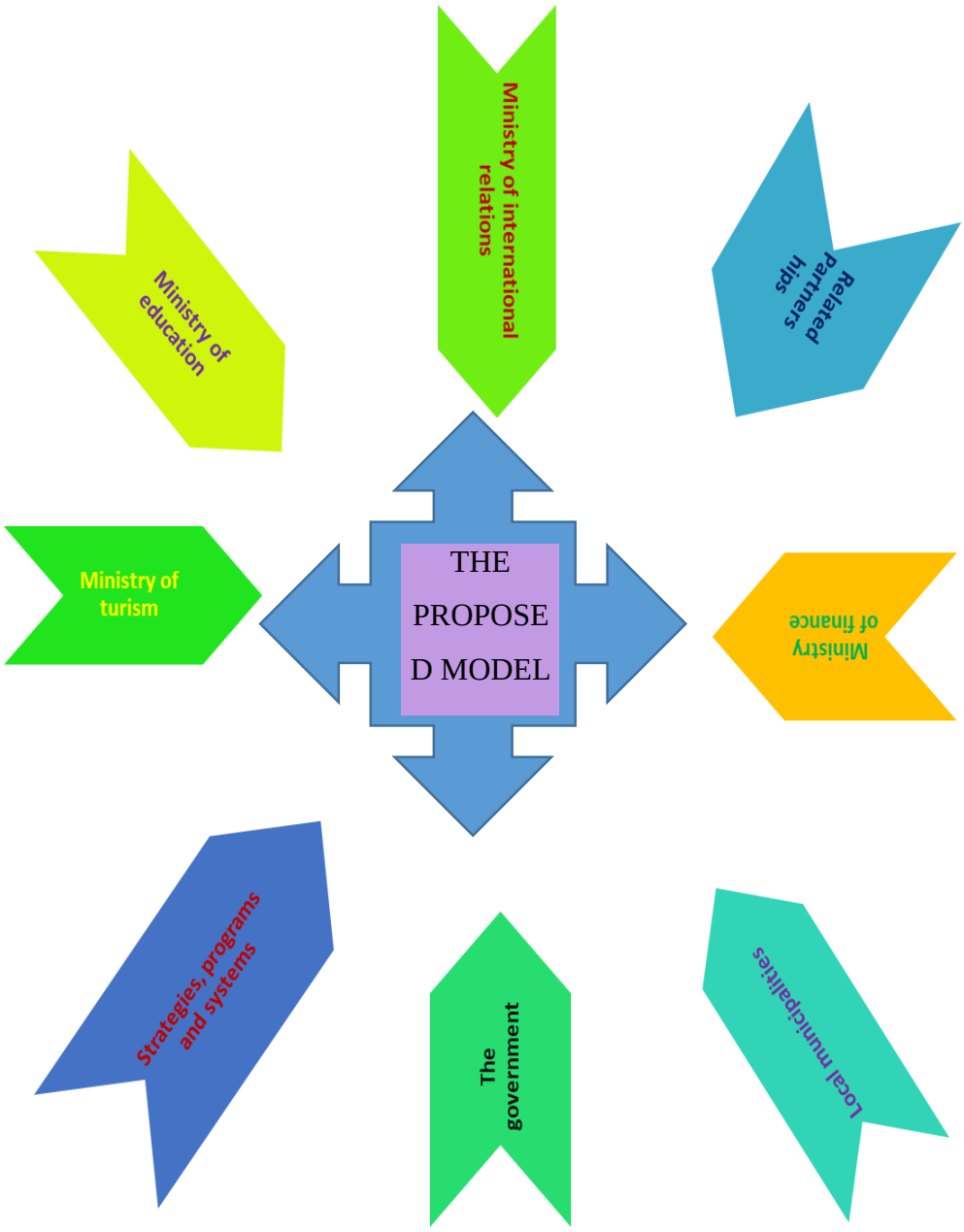



(According to the research based on figures from Israel's Central Bureau of Statistics, just 2.7 percent of all employee positions in Israel are in high-tech manufacturing fields, which accounted for a staggering 40.1 percent of Israel's total exports in 2015. Meanwhile, the total number of research faculty in Israel's eight universities (regardless of research fields) is just 0.1 percent of Israel's population 25 years old and up, and physicians account for just 0.6 percent of all persons' ages 25 and up.)

**Source:** [27, p. 2]

**Annex 41**

**The ministries and bodies related to the operation, financing and supervision of the implementation of the proposed model**




Source: Made by the Author

**Annex 42**

## The responsibilities of the ministries and bodies related to the operation, financing and supervision of the implementation of the proposed model, 2022

| The related ministries and bodied are responsible for: | | | | | |
|---|---|---|---|---|---|
| **The Government-**<br>1-With collaboration with the ministry of finance, funding and increasing the research grants to the academia. Also, it is responsible for legislation regarding government funding for academic and research institutions.<br>2-Enacting laws and regulations concerning aspects related to the model itself, as well as other aspects related to the responsibilities of the various bodies and ministries. | **The Ministry of education-**<br>1-An immediate reform in order to upgrade the higher education system and compete with parallel systems in countries around the world. This means, adopting innovative, digital, and technological teaching methods and strategies, available applications, and clear set-ups. In parallel, the tuition of international students in the programs should be adapted to the European countries with similar academic standards and in accordance with the reform countries in Bologna, Europe, and the OECD countries.<br>2- Increasing the dimensions of productivity in research and development and the rate of academic growth, and increasing all measures of scientific influence in a manner appropriate to the international publications and levels.<br>3- Diversity of the study subjects and faculties by demanded study subjects by the Israeli and foreign students. Institutions should adopt unique and attractive programs which attract more students and provide a response to the demand of both Israeli and foreign students.<br>4- Academic institutions should follow and keep pace with the modern | **The Ministry of Finance-**<br>1-budgeting and financing the proposed model, and the academic reform and system even partly,<br>2-Raising the salaries of researchers, lecturers, and experts, and improving their academic conditions.<br>3-The allocation of a larger quota of standards and jobs for experts, lecturers, researchers, and highly qualified educated people.<br>4-Providing economic benefits and all kinds of discounts and facilitation to lecturers, researchers, and highly qualified educated people.<br>5-Increasing the number of academic positions available for post-doctoral students-<br>6-Increasing the research grants and the sources of funding for academic research in Israel.<br>7-Budgeting a part of the foreign students' tuition and all that accompanies, and the adjustment of the student's tuition to the international tuition in these | **The Ministry of international relations-**<br>1-Promoting International programs,<br>2- getting advantages from the stay of Israeli students and specialists abroad and in parallel from the stay of foreign students and specialists in Israel,<br>3-developing relationships and collaborations with foreign countries. | **The local Municipalities-**<br>1-Raising awareness among high-school students and their parents in the early stages in everything related to academic studies including international programs, and its relevance to future employment in the occupational field.<br>2- Ensuring the arrival of as many foreign students as possible. So, they should take care of everything related to international programs run by the national institutions of higher education, besides all related to hosting conditions and requirements. | **The Ministry of truism-**<br>Refreshing and upgrading the marketing system and "student tourism" regulations. |

| | | | | | |
|---|---|---|---|---|---|
| | technology adopted in developed countries.<br>5- Policy-making regarding the fields available to doctoral students. | programs with similar academic standards and in accordance with the reform.<br>countries in Bologna, Europe, and the OECD countries.<br>8-Increasing the number of universities and research institutions. | | | |
| ▪ **In addition, there are related stakeholders and partnerships** such as Universities, Academic Institutions, The Council for Higher Education in Israel, and the Ministry of Justice.<br>▪ **Also,** new and appropriate strategies, programs, and systems should to be activated and adopted in all fields, in parallel to international academic programs and new marketing system. | | | | | |

Source: Made by the Author

**Annex 43**

## The main and relevant reasons that led the Israeli "minds" to emigrate from Israel

| The reason | The relevance of the reason in scale 0-10, while:<br>0- The index is not relevant at all<br>10- The index is highly relevant |
|---|---|
| The Education system. | 7.2 |
| Looking for good and better studies out of the Israeli borders | 8.8 |
| The Commercialization of senior faculty standards, and the lack of infrastructure and advanced research. | 7.2 |
| Many obstacles in the Education system, and difficult admission requirements in the Israeli universities. | 9 |
| Postdoctoral training period. | 6 |
| The low quality of children's schools. | 4.9 |
| High level of unemployment by fields and specializations. | 8.1 |
| Looking for better career and better professional opportunities in other countries. | 8.2 |
| Looking for high salaries and better economic opportunities | 9.2 |
| High level of taxes in Israel. | 7.9 |
| High costs of living in Israel | 8.9 |
| Personal choices. | 8.8 |
| To live in the core countries, in the center of the world. | 4.2 |
| The provocative and unstable security situation within the State of Israel. | 6.9 |
| Political instability. | 3.4 |
| Quality of life. | 5.8 |
| Better standard of living in other countries. | 8.4 |
| Job of the partner. | 5.5 |

**Source:** Made by the Author from sources: [26, 27, 28, 102, 155, 165, 205, 211]

## IMPLEMENTATION LETTERS

# Certification

In this period, especially in the period of the Corona crisis and its effects on almost all fields of life, both at the national and international levels, the education and academic fields were most badly affected.

f so, I'm the undersigned, Dr./ Mr. _____,

principal/manager of the Iksal High School,

have taken a personal responsibility to study in-depth and very carefully the thesis **of Mrs. Manal Amoun-Habashi** named:

**The influences of the brain drain of Israeli students studying abroad on the Israeli labor market with comparison to the international situation,** which presents and analyzes a variety of important educational elements and aspects besides multiply other elements, that help in treating and teaching different educational issues, and even charting the future academic developments of the national and international higher education institutions.

The discussed research suggests educational reform and a comprehensive initial model which includes strategies, policies, programs, recommendations, and policy-making for dealing with several academic aspects, which will lead to academic growth .

In my opinion, the work of Mrs. Manal Amoun-Habashi suggests applicable solutions and can be utilized in high schools, colleges, and specific universities' departments including our institution which undertakes to implement some of the recommendations, strategies, and educational tools, that the research work offers in the educational field.

**Sincerely,**

**Name:** Omar Shalabi **date:** 31.1.2023

**Signature**

248112

IKSAL HIGH SCHOOL

# Certification

In this period, especially in the period of the Corona crisis and its effects on almost all fields of life, both at the national and international levels, the education and academic fields were most badly affected.

f so, I'm the undersigned, Dr./ Mr. Aziz Yosef Assadi

principal/manager of high school pedagogical coordinator deir el assad.

have taken a personal responsibility to study in-depth and very carefully the thesis of Mrs. Manal Amoun-Habashi named:

**The influences of the brain drain of Israeli students studying abroad on the Israeli labor market with comparison to the international situation,** which presents and analyzes a variety of important educational elements that help in treating and teaching different educational issues.

The thesis of Mrs. Manal Amoun-Habashi suggests strategies, policy-making, and applicable solutions for dealing with very important academic aspects in high schools, colleges, and some universities' departments, and our institution undertakes to implement some of the suggested strategies and educational program.

**Sincerely,**

**Name:** Aziz Yosef Assadi **date:** 1/2/23

**signature**

المدرسة الشاملة دير الاسد
בי"ס מקיף דייר אל אסד
Deir Al Asad Comprehensive School

# Certification

**In this period, especially in the period of the Corona crisis and its effects on almost all fields of life, both at the national and international levels, the education and academic fields were most badly affected.**

If so, I'm the undersigned, the manager of El Razi high school, have taken a personal responsibility to study in-depth and very carefully the thesis **of Mrs. Manal Amoun-Habashi** named: **The influences of the brain drain of Israeli students studying abroad on the Israeli labor market with comparison to the international situation.** Actually, this is an equivalent research paper whose main results and recommendations were outlined in several publications, monographs, articles, and publications in Europe.

I highly recommend adopting the thesis theoretical foundations of brain drain and migration of intellectuals and specialists in the educational process in the Israeli Universities, colleges, and high schools, as well as the development of international educational programs for extending the joint of foreign partner

Also, the main conclusions can be used for solving Israel's economic problems, while preserving its intellectual potential, and formulating Israeli development strategy to prevent the outflow of Israeli professional resources.

If so, our institution undertakes to implement some of the recommendations, strategies, and educational tools, that the research work offers in the educational field.

**Sincerely,**

**Name:** **date: 3/9/2023**

**Signature**

## RESPONSIBILITY STATEMENT

I, Amoun-Habashi Manal, declare under my personal responsibility that the materials presented in the PhD thesis, are the results of my own research and scientific achievements. I am aware that if it does not, it will have the consequences in accordance with the legislation in force.

Amoun-Habashi Manal

Signature:

Date: _____

**CURRICULUM VITAE- CV**

***Personal Information***

**Date of birth:** December 27, 1971, The state of Israel

**ID.:** 028318129

**Address:** **PO Box 513,** St. N.1, Iksal, Israel 3702647

**Home/fax telephone:** +972-77-6464883, Mobile **telephone:** +972-52-3910947

**E-mail:** amoum.manal@gmail.com

**Nationality:** Israel

***High school and Academic Education***

- 1986 - 1990 Orthodox High School in Haifa - I graduated from high school with a bachelor's degree with honors.
- 1991 - 1994 The Hebrew University of Jerusalem - Bachelor's degree (BA) in accounting and economics.
- 2010 - 2012 The Open University - Master's degree (MA) in Education with honors President. (Two specializations - learning technologies and learning systems).
- 2017-2023 studying for Ph.D. at AAP University in Chișinău - specialization: Global Economics and International Economic relations. Faculty of Economic Sciences- Global economy, international economic relation: 521.02)

***Professional Education***

- **2003 - 2004** The Arab College in Haifa - Teaching Certificate in Mathematics with honors.
- **2005** The Arab College in Haifa - Teaching license.
- **2017-2019** I completed an internship as part of the program: Extension of certification to 5 study units in mathematics for high schools at the Technion. (I graduated in June 2019 with honors).

***Employment History***

**1994- 1995** I worked in an accounting office in Carmiel as an intern.

- **1995-1997** I worked as a lecturer at the Arab College in Sakhnin on the topics: accounting, micro Economics, and Macroeconomics.
- **1996 - 2003** I have worked at an accounting firm in Nazareth (at the same time as being a

lecturer and studying at the Arabic college in Haifa).

- **2019-2021** I have worked part-time at "Atid College" in Afula as a lecturer in mathematics.
- **2004 - to this day**, a district math instructor on behalf of the Ministry of Education and is responsible for 12 junior schools in everything related to the field of mathematics, a mathematics teacher, mathematics coordinator of the Al-Zahrawi Junior school in the village of Iksal, and an active coordinator in all related to the transitions within and between all schools in Iksal village.
- **From January 2020**, I was chosen by the Supervisor of Mathematics, as a member of the " Leader mathematics teachers' team" in order to Lead, implement and assimilate changes in mathematics programs.
- **From 31 August 31, 2023,** I serve as the principal of an educational institution on Alrazi elementary-middle school.

***Personal Skills***

- Ability for varied and interesting teaching
- Control of Office software
- Effective training ability and achieving results
- Ability to work in a multidisciplinary work team

***Knowledge of languages***

- Arabic- excellent (mother tongue)
- Hebrew -very good (native language level)
- English -very fluent

***Knowledge of computer programs:***

Window operating system, software: Office, Excel, Power point, Word including control of statistical analysis software, mathematical software such as Geogobra, Desmos and more.

***Scientific and Academic Works:***

I have written and published 26 scientific articles in Israel and in Europe, and participated in 38 local (in Israel) and international conferences (in Europe). In 24 conferences I have participated actively by writing and publishing articles, and in 14 conferences I have participated by presenting a poster or by lecturing a lecture related to the on the conference's subject.

***List of articles I have written and published:***

**Publication of articles in magazines and conferences**

**Publicarea articolelor în reviste și conferințe**

1. **HABASHI, M.** *Complete equality between female educators and male educators in an environment dominated by male mentality*. În Revista EcoSoEn, nr 4, 2018. 147-151 p. ISSN: 2587-344X.
2. **HABASHI, M.** *Consecințele economice ale migrației forței de muncă.* În: materialele Conferinței "Ştiinţă, educaţie, cultură", nr. 1, Comrat, Moldova, 15 februarie 2020. 41-46 p. ISBN: 978-9975-83-092-8.
3. **HABASHI, M.** *Correlation between professional performances and cross-border migration: conceptual discussions*. În: materialele Conferinței "Dezvoltarea economico-socială durabilă a euroregiunilor şi a zonelor transfrontaliere", v.35, Iași, România, 25 octombrie 2019. 227-233 p. ISBN: 978-606-685-687-4.
4. **HABASHI, M**. *Cross-border migration of human resources.* În: materialele Conferinței "Dezvoltarea economico-socială durabilă a euroregiunilor şi a zonelor transfrontaliere", v.33, Iași, România, 9 noiembrie 2018, 276-285 p. ISBN: 978-606-685-616-4

   **HABASHI, M**. *Cross-border migration of human resources.*In: Carmel college web-site, Israel, February, 2022. http://www.mcd.org.il/.http://mcd.org.il/site/wp-content/uploads/2022/02/cross-border-migration-MANAL-H.pdf
5. **HABASHI, M.** *Cross-border vision on the labor market*. În: materialele Conferinței "Dezvoltarea economico-socială durabilă a euroregiunilor şi a zonelor transfrontaliere", nr.35, Iași, România, 25 octombrie 2019. 220-225 p. ISBN: 978-606-685-687-4

   **HABASHI, M.** *Cross-border vision on the labor market*. In: Carmel college web-site, Israel, February, 2022http://www.mcd.org.il/.

   http://mcd.org.il/site/wp-content/uploads/2022/02/Cross-border-vision-MANAL-H.pdf
6. **HABASHI, M., GRIBINCEA, A., CARABEȚ, M., COJOCARU, V.** *Economia Cunoasetrii Și Exodul Creieril Iași*, 2019. 183-187 p. ISBN: 978-606-13-4996-8
7. **HABASHI, M.** *Education administration - the basis of the country's competitiveness,* All Arab newspaper site, 2021. disponible: https://www.alarab.com/Article/990961.
8. **HABASHI, M., COJOCARU, V., GRIBINCEA, A.** *Education management - the basis of the country's competitiveness.* În revista EcoSoEn, nr. 1-2, 2020. 7-13 p. ISSN 2587-344X. ISSN:2587-344X.
9. **HABASHI, M.** *Gradul de corelare dintre migraţie şi dezvoltarea economică.* În: materialele Conferinței "Ştiinţă, educaţie, cultură", nr. 1, Comrat, Moldova, 15 februarie

2020. 32-38 p. ISBN: 978-9975-83-090-4 (IN ROMANIAN)

10. **HABASHI, M.** *How does the state of Israel try to deal and coop with the phenomenon of brain drain and academic mobility?* In: Carmel college web-site, Israel, March, 7, 2022http://www.mcd.org.il/ http://mcd.org.il/site/wp-content/uploads/2022/03/FINAL-__Article-3-Manal-A.H.-How-does-the-State-of-Israel-try-to-deal-and-coop-with-the-phenomenon-of-brain-drain.pdf
11. **HABASHI, M.** *Immigration From Israel: a Problem or an Opportunity*. In: Application participant in the international scientific and practical conference "Actual questions of economic science in the XXI century ", October 15, 2020. UDC 37.07, 338.24.
    **HABASHI, M.** *Immigration From Israel: a Problem or an Opportunity*. In: Carmel college web-site, Israel, February, 2022. http://www.mcd.org.il/. http://mcd.org.il/site/wp-content/uploads/2022/03/IMMIGRATION-FROM-ISRAEL-A-PROBLEM-OR-AN-OPPORTUNITY.pdf
12. **HABASHI, M.** *Impactul exodului creierilor asupra economiilor ţărilor.* În: materialele Conferinței "Проблемы и вызовы экономики региона в условиях глобализации", nr. 4, Comrat, Moldova, 19 decembrie 2018, 99-111 p. ISBN:978-9975-83084-3.
13. **HABASHI, M.** *Israel-Asia Relations: Balancing Economic and National Security*. In materials of VI International round table on the topic: «Science and Innovation: Domestic and World Experience». Institute of international relations of Moldova (IRIM), Chisinau, Moldova, May 13, 2020. 31-54 p. UDK: 001.891.+378.14
14. **HABASHI, M.** *Knowledge in the service of mankind.* În: materialele Conferinței "World economy and international economic relations", nr.3, 2020, Chişinău, Moldova, 1 ianuarie 2020. 94-99 p. ISBN: 978-611-01-1615-2

    **NEW**
15. **GOLOVATAIA, L., HABASHI, M.** Migration of intellectuals in the context of the modern world economic system. Scientific-practical Journal International Relations Plus, No. 1 (21) 2022. Chisinau, Moldova. ISSN 1857-4440, eISSN 2587-3393, Tipe B. https://doi.org/10.52327/1857-4440. Pp. 127-133 (in english)
16. **ГОЛОВАТАЯ, Л., ХАБАШИ М.** Миграция интеллектуалов в контексте современной мировой экономической системы. Revistă științifico-practică Relații Internaționale Plus Nr. 1 (21) 2022. Chișinău, Moldova. ISSN 1857-4440, eISSN 2587-3393, Tipul B. https://doi.org/10.52327/1857-4440. Стр.48-54 (in russian)

17. **HABASHI, M.** *si al. Model of economic development on the way to overcome unemployment*

*and labor force growth* . In: Journal of Advanced Research in Law and Economics, 9(6), 2018. стр. 2060–2071 p. (indexat Scopus). ISSN: 2068-696X. disponible: https://doi.org/10.14505//jarle.v9.6(36).21

18. **HABASHI, M.** *Problema economică globală: sărăcirea factorilor de producție*. NIER, International Conference on Theoretical and Applied Economic Practices: Economic growth in conditions of globalizytion: welfare and social inclusion, v.1, the 14th Edition, October 10-11, 2019, Chisinau. 133-138 p. ISBN: 978-9975-3305-6-5.
19. **HABASHI, M., GRIBINCEA, A.** *Promovarea valorilor epocii cunoștințelor: de la teorie la practică*. In revista Administrarea Publică, nr.3(103), 2019. 104-110 p. ISSN 1813-8489. ISSN: 1813-8489.
20. **HABASHI, M.** Provocări și modalități de gestionare a educației (academice) migraționale și mobilitatea academică în Israel. Administrarea Publică Revistă metodico- ştiinţifică trimestrială Nr. 3 (115) iulie - septembrie 2022, Chișinău, p. 83-97. ISSN 1813-8489, Tipul B. https://doi.org/10.52327/1813-8489

    AMOUN-HABASHI M. Problems and ways of managing educational (academic) migration and academic mobility in Israel. Revistă metodico-ştiinţică trimestrială ”Administrarea Publică” Nr. 3 (115), iulie - septembrie 2022. Chișinău, 2022. ISSN 1813-8489, Tipul B. https://doi.org/10.52327/1813-8489. Pp.83-99 ((in russian)
21. **HABASHI, M., COJOCARU, V., LAZARIM, S.** *Reglementarea Economica Şi Politica De Migratie In Zona Uniunii Europene*, În: Conferinţa ştiinţifico-practică internaţională, dedicată aniversării de 30 ani de la fondarea Universităţii de Stat din Comrat 11 februarie 2021. 47-52 p. ISBN: 978-9975-3496-1-1. (IN ROMANIAN)
22. **HABASHI, M.** The causes of the Israeli brain drain. In: Școala doctorală a Academiei de Administrare Publică, Chișinău: AAP, 2022. Materiale ale Conferinţei ştiinţifico-practice internaționale, a studenților, doctoranzi, ediția I, noiembrie 19, 2021. 13-17 p. ISBN 978-9975-3418-2-0 (PDF). https://aap.gov.md/files/conferinte/19.11.21/19.11.21.pdf
23. **HABASHI, M.** *The Israeli brain drain and it`s causes*. In: Carmel college web-site, Israel, March, 7, 2022. http://www.mcd.org.il/ http://mcd.org.il/site/wp-content/uploads/2022/03/FINAL-Article-2-Habashi-Manal-The-causes-of-the-Israeli-brain-drain.pdf
24. **HABASHI, M.** *The Israeli brain drain and academic mobility of higher education students-The existing situation.*
25. **HABASHI, M.** *The Israeli-Palestinian conflict*, All Arab newspaper web-site, 2020 .
26. **HABASHI, M.** *Training qualified specialists of Israel labor market*. În: materialele

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***List of Academic conferences I have participated in:***

***Attendance at conferences***

***Participarea la conferințe***

1. HABASHI, M. Efectul migratiei si dezoltarea economica, 2018. International scientific conference, European Universities: Towards a Knowledge Society Through Europeanization and GlobalizationL, October 16-20, 2018, ULIM, Chisinau, Moldova.
2. HABASHI, M. «Наука та інноватика: вітчизняний і світовий досвід», ЗБІРНИК МАТЕРІАЛІВ, VI Міжнародного круглого столу, 13 травня, Черкаси – 2020.
3. HABASHI, M. Conferinţa ştiinţifico-practică internaţională, dedicată aniversării de 29 ani de la fondarea Universităţii de Stat din Comrat 11 februarie 2020.
4. HABASHI, M. Software for the Past (SfP) 2020, Kinneret College on the Sea of Galilee, Israel. December 8, 2020 via Zoom.
5. HABASHI, M. Academic Conference in Pandemic Days, Insights Emerging from the Corona Plague Crisis on these building blocks and the lessons to be learned from them for the future, 2020. An online conference on behalf of the Edmond de Rothschild Foundation, Sha'ar - Academic Community for Israeli Society, Shmuel Naaman Institute, 25 November 2020, Israel.
6. HABASHI, M. Tec Online Conference, 2020. Seminar Hakibbtzim College, 18 March 2020, Israel.
7. HABASHI, M. The Eighteenth Meital Conference on the Subject: Teaching and Learning Integrates Technology in Higher Education: Directions and Trends, Israel. July 1, 2020.
8. HABASHI, M. Online Seminar for Teachers on Social-Emotional Learning in Teacher Training, 2020. Mofet Institute, School of Research and Program Development Programs in the training of education and teaching staff in colleges, Israel. September 15-16, 2020.
9. HABASHI, M. International Conference of the University of –ULIM, 2020.
10. HABASHI, M. International Round Table (Moldova-Ukraine) in online format: “The actual problems of increasing the standard of living of the population and reducing the poverty level”, February 26,2021, by Department of Socio-Economic Problems of Labor of the Institute for Economics and Forecasting of NAS of Ukraine.

11. HABASHI, M. Communities in the perspective of time, În: The 6th Kinneret Conference on Education, Academia and Periphery, Kinneret Academic College, Kinneret, Israel, 15-17/03/2021.
12. HABASHI, M. Employers' Conference - Leadership and Female Entrepreneurship in the Corona Age, 2021. On behalf of: ORT Braude, Academic College of Engineering, Israel. Online Conference, April 28, 2021.
13. HABASHI, M. The Scientific-Practical Conference of PhD students entitled *"Syntheses of doctoral investigations in the field of political-administrative and economic sciences"*, November 19, 2021.
14. HABASHI, M. JEAN MONNET CONFERENCE- "Protection of Intellectual Property in the Digital Era", Chisinau, Republic of Moldova, MARCH 31, 2022.

***Various:***

- ✓ I have participated and continued to participate in all professional training in the field of mathematics knowledge, including specializations for the scientific reserve classes, computing, active learning, interpersonal communication, the bride, etc...
- ✓ From the year 2000 until today, I have been volunteering and continue to volunteer for 2 hours a day at "Yad Sara" organization in the first branch in the Arab sector in the village of Iksal, which my husband has been running voluntarily for 23 years.