



## ANALYSIS OF THE EFFECTS OF PULL AND PUSH FACTORS ON BRAIN DRAIN: AN EXAMPLE OF TURKEY

 Serpil Aytaç<sup>1\*</sup>  
 Gülşen Çetin  
Aydın<sup>2</sup>

<sup>1</sup>Prof. Dr. Bursa Uludag University, Turkey  
Email: [saytac@uludag.edu.tr](mailto:saytac@uludag.edu.tr)

<sup>2</sup>Assistant Professor Dr. Karamanoğlu Mehmetbey University, Turkey  
Email: [gulsenaydin@kmu.edu.tr](mailto:gulsenaydin@kmu.edu.tr)



(+Corresponding author)

### ABSTRACT

#### Article History

Received: 15 January 2019

Revised: 25 February 2019

Accepted: 30 April 2019

Published: 1 July 2019

#### Keywords

Brain drain  
Push factors  
Pull factors  
Binary logistic regression  
Turkey  
Migration.

#### JEL Classification:

F22; I00; B55; Z00.

Unemployment remains a major social problem with the impact of economic, social, political, historical and cultural factors. This problem is not only limited to Turkey but also becomes a global threat to other countries. Unemployment cannot be considered separately from employment. Unlike unemployment, employment policies are the process of inclusion of the labor element in the labor market. The most basic problem of unemployment and employment in Turkey; it is artificial employment and poverty rather than open unemployment in the western sense. On the other hand; frequent economic crises have led to the loss of employees' jobs. As a matter of fact, after the last crises, approximately 10 out of every 100 people, who are called as a qualified, highly educated gold collar, lost their jobs and the official unemployment rate increased from 9% to 12%. The most affected sectors are unemployed; while banking and finance and industry and service sectors are stated, there is a marked decrease in the quality of life of individuals. Another important development that attracts attention with the increasingly difficult working conditions and the economic crises is the increase of brain drain. Undoubtedly, it is possible to say that the unemployment phenomenon and the decrease in the quality of life have a significant effect on these negative developments. In this study, the reasons for going abroad and their decision to return to the country of the qualified labor force will be evaluated by logistic regression analysis in terms of pull and push factors.

**Contribution/Originality:** This study contributes to the existing brain drain literature on high skilled immigrant going abroad. This study is one of the few studies which have investigated the importance of the high skilled person going abroad from Turkey.

### 1. INTRODUCTION

Although migration is a social and economic phenomenon, it is a movement that affects both individuals, social, cultural and economic life. The most important reason that leads to migration is the desire to lead a better life. On the other hand, the impact of migration on labor markets is also very important (Bahar and Korkmaz, 2010). Economic factors and labor demand come to the fore in the migration approach from past to present (Toksöz, 2014). Brain Drain has a long history as human history. However, it is a phenomenon increasingly gaining importance since the 1960s.

In this case, the fact that technology and technology control became a major force in the 1960s has a major role. As a matter of fact, in today's global competition conditions, the gains that brain drain has turned into brain

power have brought the issue to more important and different dimensions. Brain drain is expressed as the skilled, well-educated, thinking, producing, qualified and competent professional workforce to go to another country in their most productive periods and to not return. However, the level of welfare of society is increasing in proportion to the production of science and technology. Therefore, developments in the field of science and technology can be made thanks to competent and qualified individuals. The level of development and welfare is high only in societies with high brain power.

Basic needs of societies such as education and health are shaped according to the level of development of countries. The people who understand that they cannot use their qualifications in their own countries by gaining education, knowledge, and skills in science and technology in their own countries do not want to return. All the efforts of returning individuals are wasted, they face unemployment and want to go abroad again as their competencies do not match the labor qualifications needed in their countries. For this reason, brain drain is one of the most important issues that need to be examined and maintained in terms of both causes and consequences.

The well-educated, qualified and talented manpower that a country grows to go to another developed country from a less developed / developing country (Kurtuluş, 1999; Kaya, 2002). According to Tansel and Güngör (2003) brain drain; it is referred to as information workers and quality individuals migrating from their homeland to countries that offer them more opportunities in both education and life. Briefly, brain drain is expressed as a highly educated workforce to go to the countries where life and work opportunities are higher (Gökbayrak, 2008). The concept of brain drain is the loss of human resources of a country that is trained in fields such as science, technology, industry, and services.

Whereas; according to some views, the concept of brain drain, literature, art, medicine, law, etc. such as all the other university graduates who have passed university education and even the profession, even self-educated, climbing the social and institutional steps in the industry sector has reached all levels of leader and manager (Kurtuluş, 1999). In this respect, the concept; university graduation or high-quality individuals who have extensive knowledge in a field. For this reason, experts, independent managers, senior operators, technical experts, traders, investors, physicists, businessmen, workers who work in lock jobs and subcontractors are evaluated within the scope of this concept (Gençler and Çolak, 2002). In addition, people and individuals who go abroad for education and who do not return to their homes after graduation and who prefer to work abroad are also considered within the scope of brain drain (Tansel and Güngör, 2003). Brain migration phenomenon is the most important factor affecting the development level of developing countries, especially those who have a labor shortage and who have difficulties in closing these gaps (Erkal, 1980).

In terms of both causes and consequences, brain drain creates very important effects for both emigrated and immigration countries. As a matter of fact, while brain drain causes the loss of manpower which is one of the most valuable resources that it provides with limited opportunities for the emigrant countries, it also provides a significant impetus for the development and development of the countries that have migrated. Since the differences in the distribution of brain drain between countries cannot be determined precisely, a definite benefit and cost analysis cannot be performed. However; negative effects in terms of the country that always gives brain drain are gaining more importance in the short term. This situation slows down the progress of the migrant countries and enables the developing countries to develop and this situation increases the existing inequalities among the countries (Carrington and Detragiache, 1999).

As a matter of fact, according to the researches made; about 1.5 million specialists and trained labor force from developing countries; it works in Western Europe, America, Australia, and Japan, while 500,000 students from developing countries are educated in developed countries. Two-thirds of these 500,000 students do not return to their countries after completing their education (Carrington and Detragiache, 1998).

It is possible to say that 3% of the world's population and 190 million people live in a country other than the country in which they were born. In OECD countries, this is 23% in Austria and Switzerland, while in Finland and

Hungary this rate is approximately 3% (Keeley, 2009). Brain migration is more intense in countries such as Africa and Latin America and the Caribbean, and in island states. In 2010, nearly 90% of high-skilled individuals born in Guyana lived in OECD countries. Similarly, except for Barbados, Haiti and Trinidad and Tobago, there were higher educated people in these countries. The proportion of highly educated people living in OECD countries is Jamaica (46%), Tonga (44%), Zimbabwe (43%), Mauritius (41%), Congo Republic (36%), Belize (34%) and Fiji (31%). On the other hand, most OECD countries, as well as non-OECD countries with large populations, including Brazil, China, India, and the Russian Federation, have stated that the migration rate of more qualified and skilled individuals is less than 3.5% (OECD and UN-DESA, 2013).

The United Nations (UN) states that India is the country that suffered the most from the brain drain, while at the same time India's computer industry experts reported that they suffered \$ 2 billion annually because of their work abroad. On the other hand, in the ranking of countries giving brain drain, India is followed by Pakistan, United States Community, China, Philippines, Algeria, Morocco, Tunisia, Iran, Nigeria and Republic of Turkey (Kaya, 2002).

There is a wide variety of brain drain, which has very important effects and consequences, as well as very complex reasons (Kurtuluş, 1999; Gençler and Çolak, 2002). Moreover, these reasons differ according to the countries and they take shape around the conditions that the countries have. Therefore, many theoretical and practical studies have been conducted to explain the causes of the brain drain. The most important approach in studies is; the reasons for brain migration are usually tried to be explained by the bipolar model (Kurtuluş, 1999). Both the pull sides of the country receiving immigration and the fact that the migrants have the pushing forces are the factors that accelerate the migration process. While the challenging and repressive attitude of the emigrant countries is one of the pushing factors, the opportunities of the receiving countries are pull factors.

On the other hand, economic differences between countries, low quality of life, precarious work and living conditions and uncertainties are evaluated among the pushing forces. Employment opportunities, the desired level of income generation, the quality of working life, is specified as Pull powers (Gökbayrak, 2008). As stated, although there is more than one cause of migration, the most important factor is quality of life. Individuals decide to leave their country to give themselves and their families a better life (Lordoğlu, 2015).

Besides, there are objective and subjective reasons for the pull and push factors. Factors affecting individuals' decision to migrate directly are objective factors. For example, it is possible to say that the country does not have an acceptable or preferable labor policy. Subjective factors are those that arise outside the control of that country and are mostly related to the structure of the country. Examples such as technological and scientific developments cannot be included in the country. However, these factors should be considered in a limited time and place. Otherwise, these factors may cause a false perception. Therefore, some pull and push factors are generally accepted and some of them are not dependent on the individual desire of the people who want to migrate, and some are shaped by individual wishes and desires.

However; the main reasons for brain drain are the faults in social, economic, political, science and technology policies and the distortions in education systems. Therefore, national and international influences should be taken into account in the analysis of the reasons for the migration of the competent, well-trained, well-educated academic and technical workforce.

It will be understood that the main reason for brain drain is the presence of developing countries, which are dominated by high-tech industrialized and multinational companies with large volumes of capital and business volume, on the one hand, agriculture-based economies capital insufficiency. In such a world economy, there are basic factors that force people to migrate (Shilshanic, 2002).

Nowadays, it is seen that brain drain taking place in every field of science is directed from less developed and developing countries, towards especially USA, Canada, England and Australia. In this direction, the quality of life of

developed countries, especially the economic opportunities offered by the US, Research&Developing activities, Higher Education opportunities, and their multinational companies have an important role.

Turkey is a country which is send brain drain in the historical process. The brain drains from Turkey, began in the 1960s. Immigration, which began with the leadership of doctors and engineers, continued with scientists. Initially, migration to European countries such as Germany, France, and the United Kingdom has now concentrated towards the United States. It is known that the immigrants go to the USA for educational themed purposes, such as generally taking postgraduate education and learning a language (Kapusuz, 2001).

As a matter of fact, a significant increase in brain drains towards the US and European countries have been observed in recent years. It is seen that economic crises and political instability play an important role in this increase. Turkey in 34 countries, ranking 24<sup>th</sup> with the greatest brain drain. As a result of the research; our country has lost about 60% of well-educated brains (Kaya, 2003).

The adverse living and working conditions in Turkey, play an important role in brain drain. in this study, The evaluation of brain drain from Turkey to abroad, the reasons for going abroad for well-educated Turkish citizens living abroad to return situations, are explained in relation to the push and pull factors.

## 2. MATERIALS AND METHODS

In this study, data was obtained from high skilled Turkish immigrants. 10 demographic questions, and 28 items according to the 5-point Likert scale was prepared by authors. Questions were prepared by using the questions previously used in other researches were subjected to reliability analysis. In the analysis, two questions were excluded because they did not work. The Cronbach alpha value was obtained as 0.94 and the scale was found to be reliable. The questionnaire prepared online for this study was sent to the e-mail addresses of highly educated Turkish citizens living in Australia, England, Germany and USA that the researchers had already known. Thus, the opportunity to reach many Turkish citizens by snowball sampling method has been obtained. It was understood that 592 people completed an online survey. 478 valid questionnaire forms have been obtained after removing the defective or missing data. In the analysis of the data, reliability analysis, factor analysis, descriptive statistics, cross-correlation, and categorical data and binary logistic regression analysis were applied. Logistic regression analysis using categorical dependent variable can be done in three ways.; a) Binary logistic regression, b) Ordinal logistic regression, and c) Nominal logistic regression. Binary logistic regression analysis investigates the cause-effect relationship between one or more continuous or categorical variables with two classy dependent variables with classifier and sequential measurement level.

## 3. RESULTS

The descriptive results obtained in this study are given in Table 1.

While 4% of the participants are under 26 years of age, 43.25% are between 26 and 29 years of age. Married people are 64%. The percentage of those who are Turkish citizens is 50%. 7.34% of the subjects were born abroad and 14.44% of them stated that they lived abroad for the longest period. 58.37% of the participants were university graduates, 16.11% were graduate students and 9% were Ph.D. students. However, 32.42% of the participants were highly educated, while 18.41% of the mothers were highly educated.

5.23% stated that their parents' income levels were very good, 23.43% were good, 47.49% were moderate, 19.25% were bad and 3.97% were very poor. The proportion of high school study in Turkey was 76%, while the proportion of those studying abroad is 17%. The ratio of those who read University in Turkey was 52%, the proportion of those studying abroad is 47.28%. Turkey in rates of the foreign language who graduated from high school education, while 42.68%, the proportion of foreign languages graduated from university education that is 71.76%. 47% of the participants stated that they have been abroad for 5 to 10 years and the rest have been abroad for more than 10 years.

Table-1. Descriptive Statistics.

Demographic Variables	Noun	Percent
<i>Age</i>		
- 26	17	3,59
26 - 29	205	43,25
30 - 33	122	25,74
34 - 37	64	13,50
38 +	66	13,92
<i>Marital status</i>		
Never Married	160	33,54
Married	305	63,94
Divorce	10	2,10
Widow	2	0,42
<i>Spouse</i>		
Turkish citizenship	240	50,2
Foreign	52	10,9
Double citizenship	18	3,8
<i>Place of Birth</i>		
Marmara	89	18,66
Aegean region	61	12,79
Mediterranean	39	8,18
Black sea region	49	10,27
Central Anatolia	141	29,56
Eastern Anatolia	39	8,18
Southeastern Anatolia	24	5,03
Abroad	35	7,34
<i>Education level</i>		
Vocational School	27	5,65
University Student	7	1,46
Graduated from a University	279	58,37
Master Student	20	4,18
Master's degree	77	16,11
PhD student	42	8,79
Doctorate Degree	26	5,44
<i>How many years abroad (*)</i>		
--5 Year	69	14,44
5 - 10 Year	223	46,65
11 - 15 Year	66	13,81
16 - 20 Year	28	5,86
21 - 25 Year	37	7,74
26 + year	51	10,67
<i>Graduated Area</i>		
Language and Literature	67	14,02
Mathematics / Science	65	13,60
Health Sciences	12	2,51
Social Sciences.	127	26,57
Technical Sciences	193	40,38
Agriculture and Forestry	3	0,63
Art	4	0,84
Other	2	0,42

On the other hand, 40.38% of the participants graduated from the technical sciences and 30% from social sciences. 70% of the participants stated that they are satisfied with their country, 5.44% said they were not satisfied and 23.85% stated that they were unstable. In contrast, 42.89% of respondents contemplating returning to Turkey, does not intend to return to 56.28%. 73% of the participants stated that they have relatives abroad. 81.38% of them work in full time. 28% of the monthly average is between 2001 and 3000 \$, 11% of the monthly net income between 5001 and 10000 \$. The 10% slice did not indicate its income.

### 3.1. Data Analysis

In the analysis, explanatory factor analysis with the varimax method was applied. According to the results, the data were found to be suitable for factor analysis.

#### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,922
Bartlett's Test of Sphericity	Approx. Chi-Square	5563,493
	df	378
	Sig.	,000**

\*\*p<0.01 (\*\*Correlation is significant at the 0.01 level (2-tailed).

Factors were collected under 2 headings. 2 factors, explaining Total variance 2 factors explain 48.9% of the total variance. 13 items were collected under the push, and 13 items were collected under the title of pull factors. Factor loads are below [Table 2](#).

**Table-2. Component Matrix<sup>a</sup>. for Factor Analysis.**

No	Items	Component	
		F1 (1) Pull Factors	F2 (2) Push Factors
3)	I want to live in my dream abroad	.522	
5)	It is advantageous to have an education abroad	.667	
6)	Standing on my own feet (desire for independence)	.523	
7)	High quality of life abroad	.633	
9)	The existence of institutionalization abroad	.532	
14)	The desire to achieve a better standard of living	.683	
20)	political freedoms	.484	
21)	valuation of human rights	.531	
22)	emphasis on science and technology	.771	
24)	supporting the production of ideas	.796	
26)	equality of opportunity in education	.575	
28)	education without examination	.392	
4)	I have a good foreign language education		.668
10)	Unemployment		.740
11)	Economic instability and crisis		.855
12)	Low wage policy		.828
13)	Disorder of income distribution		.841
15)	Future anxiety		.699
16)	Political instability		.771
17)	Ethnicity discrimination		.503
18)	Extreme bureaucracy		.669
19)	Distrust of the state		.701
23)	R & D is not given importance in our country		.704
25)	Lack of national income to education		.626
27)	The lack of permanent national education policy in our country		.556

(F1) The variable with the strongest association to the underlying latent variable. Factor 1, is production ideas, with a factor loading of 0.65.

(F2) The variable with the strongest association to the underlying latent variable. Factor 2, is income, with a factor loading of 0.84.

According to these results, pull factors such as "education without examination at overseas (75%) were among the factors that led the higher educated people to be having political freedoms abroad in (71%).

According to [Table 3](#), as the reason for the migration of highly educated, 86% of "ethnic discrimination", 67% "unemployment in Turkey", 62% "state of insecurity", 57% "over bureaucracy" cited, 55% "political instability", 52% cited economic instability and crisis. It can be said that the rates of the push factors are higher than the pull factors as the reasons for migration from our country. This finding shows that the negative life and working conditions in our country forced highly educated people to migrate abroad.

Table-3. Frequency Distribution Related To Reasons for Going Abroad.

Pull and Push Factors	Absolutely Effective		Effective		Unstable		Not Effective		Absolutely Not Effective	
	N	%	N	%	N	%	N	%	N	%
<b>Pull Factors (CF)</b>										
CF3- I want to live in my dream in abroad	124	27.3	58	12.7	94	20.7	116	25.5	63	13.8
CF5- It is advantageous to have education in abroad	143	32.9	48	11.0	34	7.8	93	21.4	117	26.9
CF 6- Standing on my own feet (desire for independence)	75	16.9	51	11.5	72	16.2	156	35.1	90	20.3
CF7- High quality of life in abroad	106	23.9	65	14.6	71	16.0	122	27.5	80	18.0
CF9- The existence of institutionalization	181	42.1	89	20.7	67	15.6	69	16.0	24	5.6
CF14-The desire to achieve a better standard of living	104	23.3	47	10.5	56	12.5	142	31.8	98	21.9
CF20- Political freedoms	215	49.2	95	21.7	47	10.8	50	11.4	30	6.9
CF21- Valuation of human rights	160	37.0	87	20.1	55	12.7	73	16.9	58	13.4
CF22- Emphasis on science and technology	104	24.1	59	13.7	59	13.7	109	25.3	100	23.2
CF24- Supporting the production of ideas	121	27.8	70	16.1	66	15.2	98	22.5	80	18.4
CF26- Equality of opportunity in education	140	32.3	82	18.9	72	16.6	85	19.6	55	12.7
CF28- Education without examination	234	53.5	93	21.3	35	8.0	44	10.1	31	7.1
<b>Push Factors (IF)</b>										
IF4- I have a good foreign language education	136	30.9	77	17.5	55	12.5	112	25.5	60	13.6
IF10- Unemployment	215	49.1	79	18.0	58	13.2	53	12.1	33	7.5
IF11- Economic instability and crisis	148	33.6	79	17.9	73	16.6	85	19.3	56	12.7
IF12- Low wage policy	142	32.1	85	19.2	72	16.3	87	19.6	57	12.9
IF13- Disorder of income distribution	131	30.0	69	15.8	78	17.9	91	20.9	67	15.4
IF15-Future anxiety	104	23.4	68	15.3	79	17.8	104	23.4	89	20.0
IF16-Political instability	158	36.0	83	18.9	64	14.6	72	16.4	62	14.1
IF17- Ethnicity discrimination	280	65.4	87	20.3	39	9.1	13	3.0	9	2.1
IF18- Extreme bureaucracy	164	37.5	87	19.9	76	17.4	68	15.6	42	9.6
IF19-Distrust of the state	199	45.5	74	16.9	60	13.7	65	14.9	39	8.9
IF23-R & D is not given importance in our country	135	32.1	79	18.8	76	18.1	71	16.9	59	14
IF25-Lack of national income to education	123	28.1	103	23.5	87	19.9	78	17.8	47	10.7
IF27-The lack of permanent national education policy in our country	135	31.3	91	21.1	86	19.9	80	18.5	40	9.3

(CF) Pull Factors

(IF) Push Factors:

Frequency table and component values of pull and push factors are presented in Table 4. Do you think the return to Turkey? According to the answer given to the question, the binary logistic regression model consisting of 43 independent variables for the reasons of socio-economic variables and going abroad is estimated. The prediction results of the model with only the fixed term are as in Table 4. This model is statistically significant and is as in Table 5 and Table 6.

Table-4. Variables in the Equation (Fixed Term).

	$\beta$	S.E.	Wald	Df	Sig.	Exp( $\beta$ )
Step 0 Constant	0.366	0.134	7.519	1	0.006*	1.442

The first step, called Step 0, includes no predictors and just the intercept.

\*p&lt;0.05 (\*\*Correlation is significant at the 0.01 level (2-tailed)).

Under Variables in the Equation we can see that the intercept-only model is  $\ln(\text{odds}) = 0.366$ . If we exponentiate both sides of this expression we find that our predicted odds  $[\text{Exp}(B)] = 1.442$ . That is, the predicted odds of deciding to continue the research is 1.442

Table-5. Model Summary.

Step	-2 Log L Likelihood	Cox & Snell R Square	Nagelkerke R Square
1	174.576	0.452	0.609

Step 1 results obtained by "Enter" method including independent variables in the model.

Table 4 shows the R<sup>2</sup> values. The Cox & Snell R<sup>2</sup> value is 0.452 and the Nagelkerke R<sup>2</sup> value is 0.609. The Nagelkerke R<sup>2</sup> value is greater than the Cox & Snell R<sup>2</sup> value. This value shows that 0.609 of the variances in 43 independent variables is caused by explanatory variables.

Table-6. Wald Statistics in Equation.

B: Parameter value calculated from the model S.E.: Standard error of parameter Wald: Wald statistics Df: Degree of freedom Sig.: p Exp (B) : Odds ratio		β	S.E.	Wald	df	Sig.	Exp (β)	95% Confidence Limits for Exp (β) Lower Upper	
A	Age	-0.145	0.071	4.198	1	0.040	0.865	0.753	0.994
d	Family income	0.745	0.305	5.952	1	0.015	2.210	1.158	3.830
1	Years abroad	-0.150	0.056	7.147	1	0.008	0.861	0.771	0.961
M	Graduation Area	0.438	0.261	2.817	1	0.093	1.549	0.929	2.582
1 <sup>a</sup>	Satisfaction	2.897	0.688	17.716	1	0.000	18.122	4.702	69.836
CF1	Overseas relatives	-0.355	0.197	3.238	1	0.072	0.701	0.476	1.032
CF2	Overseas friends	0.391	0.179	4.774	1	0.029	1.478	1.041	2.099
CF3	Dreams	-0.658	0.216	9.268	1	0.002	0.518	0.339	0.791
CF5	Training advantage	0.301	0.166	3.284	1	0.070	1.351	0.976	1.870
CF9	Institutionalization	-0.369	0.200	3.388	1	0.066	0.692	0.467	1.024
IF10	Unemployment	0.727	0.267	7.442	1	0.006	2.069	1.227	3.490
IF12	Lack of wages	-1.543	0.453	11.580	1	0.001	0.214	0.088	0.520
IF13	Distorted income distribution	1.084	0.434	6.238	1	0.013	2.956	1.263	6.919
CF20	Political freedom	-0.681	0.335	4.121	1	0.042	0.506	0.262	0.977
CF26	Opportunity in education	0.588	0.300	3.835	1	0.050	1.800	1.000	3.242
IF27	National education policies	-0.531	0.304	3.046	1	0.081	0.588	0.324	1.067
	Fixed term	0.119	3.419	0.001	1	0.972	1.126		

\* In Step 1, Entering Model is given as 16 meaningful from 43 variables.

Signals of statistically significant parameters indicate the direction of the relationship. The dependent variable is "Do you want to go back to Turkey?". When he replied "Yes", as 1 coded for those and who say "no" to those were coded as 0. Accordingly, the income category in the periods when the parents of the subjects were supported in high school and university education were positively correlated with the graduation area, satisfaction with being abroad, CF2, CF5, IF10, IF13, and CF26. However, it can be said that there is a negative relationship between age, abroad time, CF1, CF3, CF9, IF12, CF20, and IF27. The fact that the variables other than these variables are not statistically significant means that they are not a risk factor that can be considered important for the return of Turkish citizens living abroad.

The values in the Exp (β) column are the Odds ratios, for example, the parameter for the Age variable is calculated as follows.

$$Exp(\beta) = e^{\beta} = 2,71828^{-0,145} = 0,865$$

Odds ratio, the probability of occurrence of an event, based on the probability that ratio does not occur, the probability of rate return is likely to return to Turkey. On the other hand, the parameters in the predicted model indicate the effect of the one-unit change on the argument to the Log Odds value, provided that the other arguments remain constant. For example, it can be said that a one-unit increase in the Age variable (from a small code value to a large code value) would result in an increase of 0.865 in the Log Odds value.

Coefficients (10% level though) statistically significant within and greater than 1 Exp ( $\beta$ ) having a value of family income level, graduated areas, satisfaction abroad, CF2, CF5, IF10, IF13, and CF26 can be said that they are important risk factors on the request from abroad to return to Turkey.

Graduated area, satisfaction abroad, CF2, CF5, IF10, IF13, and CF26 could be said that domestic and foreign important risk factors on the desire to return to Turkey. Similarly, the coefficients which are statistically significant and 1 less than or near 0 Exp ( $\beta$ ) having a value, age, duration of presence abroad, CF1, CF3, CF9, IF12, CF20 and IF27 variables of foreign countries from Turkey are important risk factors that have a negative impact on not wanting to return. As a matter of fact, the fact that these variables have negative markings also supports this interpretation. Even if other variables are not effective alone, it can be said that they contribute to the determination of the change in the decision to return / not to return abroad (because the variables are collectively meaningful).

#### 4. DISCUSSION AND CONCLUSION

Although migration movement is a dynamic movement, its causes and consequences vary according to the period of migration. The brain drain refers to the transfer of qualified staff of the push factors of underdeveloped countries appealing and the pull factors of the developed countries.

Push factors; while the lack of employment opportunities, brought by industrialization, population growth, low income and safety concerns, pull factors, desired working conditions, income opportunities and education constitute.

The most important factor that increases the welfare level of a society is undoubtedly the emergence of innovations in the field of science and technology. Science and technology; increases well-educated, thinking, producing, qualified brains. In this context; societies with high power to produce science and technology have attained welfare. The fact that human resources, which is well-educated, competent, qualified in their field and which is a very important power for our country, is lost through brain drain without being transformed into productive employment was very sad.

The reasons for individuals to brain drain and return to the country are quite complex and may vary depending on time, country of residence and area of expertise. In addition, the employment conditions, economic opportunities, in short, the high level of development and welfare of the country which the overseas country, reduce the return considerably. In summary, the migration of qualified persons to foreign countries can be considered as a reflection of the differences between low development and international income and wealth distribution.

On the other hand, the demand for qualified personnel of multinational companies, which further increases the advantages of developed countries in global competition, which is one of the main factors that encourage external migration increases every year. It can be said that the dual structure, which is characterized by development and underdevelopment between economies, will increase brain drain in the following years. In order to make the willingness to return from abroad, the performance of the country's top executives and politicians should contribute to the development of the country and regional initiatives should be encouraged.

As a matter of fact, Pazarçık (2010) made a study by reaching approximately 50 Turkish academicians from the universities in the United States. Some important findings concerning the tendency to return to Turkey of the participants were obtained. The most important impulsive reasons were the lack of academic merit, not being satisfied with the workplace, lack of suitable environment for specialization, inadequate academic/scientific infrastructure and low wages. According to the findings of the research, the most significant reasons were found as being unsatisfied with social life, unemployment, and political reasons. The most important attractive reasons were the presence of the best programs in the field of specialization, high wages, the applicability of academic education and a peaceful working environment. In addition, 80% of the participants believe that the economic, social and political reason for the immigration. More than half of the respondents (64%) were indicated that they consider returning to Turkey. In our study, more than half of respondents thinking that a similar reason for brain drain.

In his study, [Güngör \(2010\)](#) stated that students are encouraged to study abroad and that they must serve when they return to their dormitory until the period of education they receive. However, he emphasized that this situation has no deterrent effect.

A study was done by [Güngör and Aysit \(2014\)](#) to measure the intentions brain drain of skilled migrants' from Turkey. In this study, economic instability and employment factors are considered as push factors from Turkey to go abroad. The importance given to the family and social factors is among the pull factors to stay in Turkey. When the tendency of female and male participants to return back, women tend to have less tendency than men. The main reason for this is expressed as socio-economic indicators. In addition, the participants had emphasized that the lifestyle and freedom of choice abroad are more important and stated that these factors have a great effect on the return decisions. Therefore, the findings of other study support our study and reveal that brain drain for individuals is attractive for some reasons.

[Deviren and Daşkiran \(2014\)](#) conducted a study in Mugla in Turkey on teaching staff returning from abroad. A total of 106 teaching staff, 42 female and 64 males, participated in the study. In contrast to the common opinion, it was found that half of the lecturers were satisfied with returning to their homeland and did not want to migrate abroad again. This is due to the fact that there is mandatory service duty, a desire to apply what is learned abroad, and that the social and cultural environment in Turkey is more attractive. Among the reasons why academics want to continue their studies abroad are reasons, such as the lack of time to conduct research in Turkey, lack of research facilities, bureaucratic barriers and inability to be satisfied with the salary have been obtained. It is stated that among the most preferred countries are the developed countries such as the United States, England, Australia, and Germany.

[Elveren and Toksöz \(2018\)](#) carried out a study supported by the Presidency of Turks Abroad and Related Communities and tried to revise the tendency of Turkish Ph.D. students to return to Turkey. The study included 116 students and 84 employees. When the findings were examined, it was found that there was a strong relationship between the intention to return when individuals first migrated abroad and their current intention to return. Participants living abroad for many years have been found does not want a return to their home country. In addition, when the factors such as taking part in education and working life are taken into consideration, it is stated that there is a tendency for women not to return to their homeland compared to men. The main reasons for this are the positive life for women abroad and the more pull factors in abroad.

According to the findings in our study, it was understood of the immigrant's relatives that 70% were abroad, for this reason, immigrants were able to go abroad easily. 70% were satisfied with being abroad. Nearly half of them were educated in technical science and the reasons for immigration abroad were higher than pull factors.

Therefore, for reducing and eliminating the problems caused by brain drain, the development of international migration policy seems to be a solution for the brain drain, but in fact, it brings with it many problems. It should also be noted that some principles are also important in establishing migration policies. Some of these principles are given below ([Tokoksöz et al., 2012](#)).

- Employees should be given the opportunity to work by providing equal opportunities in line with the principles of equality, freedom, and justice.
- Policies should be fair within the framework of international working standards.
- When the management of migration is evaluated in terms of both the target, the source country, and the individuals, the three sides should be inclusive and consistent.
- Migration policies should be sensitive to gender issues.
- Migration policies should be expanded in line with demographic variables and working life needs.

**Funding:** This study received no specific financial support.

**Competing Interests:** The authors declare that they have no competing interests.

**Contributors/Acknowledgement:** Both authors contributed equally to the conception and design of the study.

## REFERENCES

- Bahar, O. and B.F. Korkmaz, 2010. Effects on employment and labor market internal migration in Turkey. *Stileyman Demirel University Journal*, 15(2): 43-61.
- Carrington, W.J. and E. Detragiache, 1998. How big is the brain drain? IMF Working Paper: No. 98. pp: 1-27.
- Carrington, W.J. and E. Detragiache, 1999. How extensive is the brain drain? *Finance and Development*, 36(2): 46-49.
- Deviren, P.N. and F. Daşkıran, 2014. Faculty members studied in abroad and returned, view to Brain drain: The case of Muğla Sıtkı Koçman University. *Dumlupınar University Journal of Social Science*, 41(1): 1-10.
- Elveren, A.Y. and G. Toksöz, 2018. Brain drain write in Turkey and a field research. *Gürhan fireworks tracing the joint labor collective action*. Ankara. Turkey: Political Publishing House.
- Erkal, M., 1980. Migration brain drain. *Istanbul Journal of Sociological Studies*, 0(18): 73-80.
- Gençler, A. and A. Çolak, 2002. Turkey from abroad brain drain: The economic and social effects. (Conference Paper), Kocaeli University First National Knowledge, Management and Economy Congress, Izmit. Turkey.
- Gökbayrak, Ş., 2008. International migration and development debates: A study on brain migration. *Ankara University Journal of SBF*, 63(3): 22-28.
- Güngör, N.D., 2010. Education, globalization and brain migration. *İz, Atılım University Journal*, 9: 33-36.
- Güngör, N.D. and T. Aysıt, 2014. Brain drain from Turkey: Return intentions of skilled migrants. *International Migration*, 52(5): 208-226.
- Kapusuz, A., 2001. Is the stone and gold in the soil? . Available from <http://www.netyorum.com/> [Accessed 09.10.2017].
- Kaya, M., 2002. Brain drain. Available from <http://www.ogu-tekamsitemynet.com/yazilar/> [Accessed 22.04.2007].
- Kaya, M., 2003. Brain earthquake erosion. *ISGUC Industrial Relation and Human resource Journal*, 5(2): 37-41.
- Keeley, B., 2009. International migration: Human face of globalization. OECD: 1-7. Available from <http://www.oecd.org/insights/43568302.pdf> [Accessed 12.04.2017].
- Kurtuluş, B., 1999. Turkish brain drain to the United States, Alfa, Publications, No. 30. Istanbul. p: 108.
- Lordoğlu, K., 2015. Some aspects of living and working conditions of immigrants in Turkey. *Work and Society*, 1: 29-44.
- OECD and UN-DESA, 2013. World migration in figures, A joint contribution by UN-DESA and the OECD, the United Nations high-level dialogue on migration and development, 3-4 October. Available from <https://www.oecd.org/els/mig/metadata.pdf> [Accessed 7.03.2015].
- Pazarçık, S.F., 2010. Migration the case of brain migration and a study on Turkish social scientists working in United States universities. Unpublished Master Thesis, Çanakkale Onsekiz Mart University. (A Case Study of Brain Migration and A Study on Turkish Social Scientists at United States Universities, Unpublished Master Thesis, Çanakkale Onsekiz Mart University).
- Shilshanic, N., 2002. Study of concepts and causes of brain drain-aun report. *Inter-Discipliner Studies*, 156. Seminars. Available from <http://shilshanic.nic.in/cd50years/z/sT/H3/8TH30101.htm> [Accessed 10.12.2010].
- Tansel, A. and N.D. Güngör, 2003. Brain drain” from Turkey: Survey evidence of student non-return. *Career Development International*, 8(2): 52-69.
- Tokoksöz, G., S. Erdoğan and K. Selmin, 2012. Irregular labour migration in Turkey and impact of migrant workers on the labour market. *IOM Turkey*. International Organization for Migration. October. pp: 146.
- Toksöz, G., 2014. Global forum on migration and development, migration 1. *Journal of Urban Studies*, 14: 29-37.

*Views and opinions expressed in this article are the views and opinions of the author(s), Journal of Social Economics Research shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.*