

Current Factors of Iran's Brain Drain, Analysis, Reasons and Influences

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Abstract. In the last few decades with the emergence of globalization, migration and brain drain became one of the important factors of economic development and played an important role in the globalization process. The usual flow of high skilled and educated individuals is from developing and under developing countries to the more developed countries such as the USA and Europe. Different factors are influencing on brain drain which are divided into push and pull factors. In this research, we examined Iran's brain drain, we created five hypotheses influencing on brain drain such as military service, gender discrimination, unemployment, infrastructures and hope for future,. The results received from survey and interview shows that military service, gender discrimination and hope for future have significant relationship with brain drain but we are unable to certainly illustrate the impact of unemployment rate and infrastructure on brain drain. Methodology used in this research is combination of interview and survey. Six candidates from the USA, Europe, Malaysia and Iran were interviewed, and we distributed 100 questionnaires among Iranian students currently studying in Russian universities in Moscow.

1. Introduction

In the last decades migration has been one of the important factors of economic development, anytime in the history when situations were not favorable skilled workers and scientists emigrated, that is called brain drain. Brain drain as a more complex phenomenon than migration has become one of the main branches of this field; it mostly concerns developing countries dealing with the emigration of skilled and educated forces to developed countries with higher standard of living. Brain drain directly and indirectly affects the countries' development. In the other side, developed countries will benefit human capital at the expense of other nations and they are adopting policies to attract more high skilled forces.

Brain drain is permanent or temporary emigration of educated and skilled workers [1]. Although, many researches have shown negative effects of brain drain, recent researches have shown that brain drain may also positively influence on economic development of a country, emigration of skilled workers in terms of human capital formation and production technology is beneficial for all the citizens in developing countries [2]. Moreover, emigration of skilled workers can provide investment in education in home countries and it will have positive effects [3], it increases the education rate and more people will acquire a tertiary education and thus educated individuals who remain in the country will increase and they will earn more money, so they pay more taxes, and public spending will increase as well.

Skilled workers have a great role in economic growth and social development. They can also affect the cultural changes in the society; therefore, social, economic and technological developments are

because of their efforts [4]. High skilled workers are more responsive than low skilled to push and pull factors. Therefore interaction between the push and pull factors ultimately leads to migrants' intention to migrate to more favorable places [5]. It is estimated that around 244 million people have emigrated from their home countries which is 3.3% of the world population [6]. There are many reasons of increases the brain drain rate in Iran. One of the main problems is ineffective higher education system and unfavorable universities' conditions. Although number of universities is expanded, governments are still unable to meet the needs of applicants who wish to enter free of charge public universities. Therefore a very difficult entrance examination is held to choose the candidate that discourages students to stay [7].

According to the statistics provided by the United Nations among 72 developing countries Iran ranked third in terms of the brain drain where US was the main destination [8] and that they are unlikely to return home [9]. But the problem of brain drain was denied by the Iran's president Ahmadinejad between 2005–2009, in 2009 IMF also reported that Iran by having 180,000 high skilled individuals emigrated yearly has the highest level of brain drain among 91 developing and less developed countries, and out of 420,000 Iranians living in US, 250,000 were physicians and engineers [9]. Later on, in 2010 government felt the existence of the problem and a committee was established to tackle the issue [10]. Based on what Iran's Minister of Science, Research and Technology, Reza Faraji Dana announced in 2017 every year 150,000-180,000 educated people are emigrating from the country that 39.2% of them are females (Department of Economic and Social Affairs-Population Division 2013b). By emigration of high skilled individuals Iran is losing around 50 billion \$ yearly. Because of the high unemployment rate 12.7%, number of educated Iranians willing to migrate to the countries with higher standards of living is increasing. In 2014 it was reported that 120,000 were studying abroad, Malaysia, the USA, Europe, Canada, Australia and East Asia were the main destinations for Iranian students [11].

In Iran, after the 1979 Islamic revolution and the regime change, with the help of many internal and external factors, emigration of educated and skilled forces to the USA and Europe started [12]. Therefore, from 1960-1980 the first wave of emigration because of the political instability started by the affluent families, supporters of the Shah, military personnel and members of religious minority groups such as Jews and Baha'is, who were able to send their children abroad to study [12]. In 1977-1978 academic years, about 100,000 Iranian students were studying abroad, that around 36,000 were registered in American universities. [12]

Later on during 1980-1990, the highest level of emigration started, which is called the second wave of emigration and it was four times more than the first wave. In this wave, brain drain drastically increased, and many academics, professors, members of political parties and women started to emigrate from the country, main reasons of emigration in this period was the gender discrimination, religious limitations, the eight-year Iran-Iraq war and ideological suppressions. The new regime started to clean the universities from those academics and professors who were the Shah's supporters and in the next step they tried to replace them with the government supporters which the main reason was to de-westernize the higher education systems that resulted in closing the universities for couple of years. [13]

Third wave of emigration started from 1990–2000, during this period and since the mid-1990s in addition to brain drain number of Iranian refugees and asylum seekers increased, and America alone accepted 112,597 Iranian immigrants which was less than the decade ago with 154,857 [12]. Although America accepted less Iranians, the UNHCR in 2004 ranked Iran tenth among the countries with high asylum seekers across Europe and by the end of 2005 “there were 111,684 refugees, asylum seekers, internally displaced persons (IDPS) and other persons of concern from Iran worldwide of which 20,541 were hosted by the United States” [12]. Therefore, in the third wave since the mid-1990 although the size was smaller, it was completely different and many high skilled workers left the universities and research institutions, and number of economic refugees who were less skilled increased. This process

continued to 2009 controversial presidential election of Mahmoud Ahmadinejad that again influenced on the emigration of educated Iranian and skilled forces, and increased number of asylum seekers and refugees in western countries for example asylum applications in Germany had an 80 percent increase that means 250 applications per month [14].

2. Literature Review

High unemployment level about 12,5 % has been one of the reasons of emigration, every year around 300,000 are graduating from the universities and yearly around 800,000 are joining the labor force of Iran who are unable to find jobs, only 20% succeed to find jobs [15]. In the research done by Thomas, (2006), is shown that corruption, government mismanagement, bureaucracy, governmental control over economy, and weak policies to encourage private sectors are the main factors of capital and human capital flight from Iran [16]. Yet, the government is unable to provide jobs for educated people, because creating a good paying job is costly and it is out of government's abilities, it almost costs 18,000\$ to create jobs for skilled workers [18], accordingly, individuals leave the country, they study and train in western countries, after the graduation and back in home they face cultural shocks and they feel that they are deserved of a better life and they become frustrated, because their abilities are not perceived and they may not have the living standards they desired. [19]

Second, is the political, social and economic crisis, since many young Iranian educated are familiar to the foreign cultures (especially western cultures) by the help of satellite television, internet, social networks or travelling, they are not tolerating the suppression of their freedom, their rights, and expressions [17]. So, because of the governments' inability to provide the same civil, economic and political rights for people, those educated would consider to act in opposition as they did in 2009 green movement during the controversial presidential election, that many educated Iranians, professors, high and low skilled workers and women started to fight for their rights that student groups and committees were the major part of this movement's body who were actively presenting themselves in the suppressed political scene of Iran and it resulted the confrontation with and violence with student protests in December 2009 [17]. Based on United Nations report this occurrence in June 2009 increased number of refugee applications for more than 4,200 worldwide that main portion were students.

The third important factor that results brain drain is the difficult university entrance examination called "Konkoor" which probably comes from the word "concur" that is process of sourcing, screening and selecting people for different purposes. This exam is a comprehensive multiple question exam which covers all the subjects taught in Iranian high schools, students are allowed to repeat examination as many as they want until they pass. It is very competitive examination for high school students to secure their seats in governmental free of charge universities because number of seats are limited and only 10-12% of applicants can enter these universities. This difficult process, convince failed students to leave the country and pursue their studies in western countries and countries such as Malaysia, Australia, Russia and Eastern Europe. Moreover during 2011-2012 around 8.48 % of bachelor graduated students emigrated from Iran and many of them left the country after their masters or Ph.Ds. at the moment Iran has around 51,000 mobile students which is 1% of total world's mobile students (4,854,346) (Migration data portal), total number of high skilled emigration is around 3% of that. According to the ministry of Science, around 12,000 Iranians after the Islamic revolutions have been given budget by governments to study abroad, but only 400 of them returned back. Ratio of graduated student's emigration to the total number of students abroad (51,000) is almost 15 %, and based on Parliament Education Commission just their emigration trips and planning cost 4 billion dollars. UNESCO provides Iran's public spending on education, as percentage of GDP from 1971 to 2016. The average value during that period was 3.87 percent with a minimum of 2.69 percent in 1974 and a maximum of 7.13 percent in 1981 (The global economy).

Table 1. Top 15 Destinations for Iranian Students in 2016.

United states	11455
Turkey	5661
Italy	3935
Canada	3735
United Arab emirates	2297
Australia	2258
United kingdom	1522
India	1459
France	1415
Malaysia	1313
Austria	1232
Sweden	1226
Hungary	1116
Belarus	866
Finland	607

Source: UNESCO institute for statistics

Entrance examination factor not only makes problems for the failed students but also those who were accepted in the universities become frustrated by the atmosphere in the education system, lack of curricula and social environment, weak research environment, weak faculty members and staff, islamisation of universities, lack of freedom of expression, migration of skilled staffs and professors are the main factors of frustration, moreover, restrictive policies and suppression of ideologies of professors and academics increases the dissatisfaction. Kamyab (2007) showed that many of the experts and academics felt excluded from decision making and they felt unappreciated because there is no enough research facilities, laboratories, new books, access to education website, salaries and supports so they decided to leave by requesting the unpaid leave, that acknowledges the intention to stay abroad, hence cost of nurturing education people are high in western countries, they are enjoying the profits of Iranians' immigration where they are educated free of charge at the expense of their own government [20]. So, migration happens not only because of the individuals' free choice but in many situations they are forced to emigrate, to escape unemployment, poverty, instabilities and etc. which are the result of global political-economic structure.

Dependency theory argues that inequality and imbalance between developed, developing and underdeveloped countries is a kind of relation between them, and migration by the flow of human capital to those developed countries increases the development of developed countries at the expense of those poor, underdeveloped and developing countries because movement of low skilled workers provides a cheap labor force, and high skilled workers provide free human capital to the developed countries [21]. Based on report from the World Bank, 2009 Over 70% of the costs of education in developing countries is financed from public sources, and by emigration of skilled workers, governments also lose the taxes that they were planning to receive from them in the future and their revenue is lost.

Shahabadi and Jameh Bozorgi (2014) revealed that economic, political and civil liberty has a significant negative effects on emigration of skilled workers, in addition, unemployment rate of the university graduates has not any impact on migration flows but it has significant effect on brain drain rate, human development index was also one of the factors influencing on brain drain rate and migration [22]. In another social research done by Janalizadeh et al. (2014) found out that more than 50% of the skilled workers tend to stay in Iran, and only 25% were interested in emigration due to the

social differences between inside and outside of the country. Attraction rate of destination countries as a pull factor and repellent push factors were the main reasons convince them to emigrate [23].

3. Methodology

In researches with scarce literature, the qualitative method can be very useful; one of the methods used in qualitative method is ground theory. This theory analyzes data during the study [24]. One of the main requirements in this method is to create as broad question as possible, and then it can be narrowed down and tailored [25]. Therefore in this study, the main question is:

Why did educated and high skilled emigrate?

In order to collect data, mix of interview (long talks) and survey (with short talks) was conducted.

Six high educated (Masters, PhD students and workers) Iranian students from the USA, Germany, Malaysia and Russia were interviewed:

These candidates were chosen using purposive sampling method in order to have emigrants with different situations. After each interview session, data were studied and analyzed. Related answers with our topic were identified and labeled. Then the results' similarities and differences were compared and the answers were categorized. These categories were linked during the axial coding process, and all the results were shown to the participants that they could assess the validity and reliability of these codes. All the interviews were noted on a regular basis, the longtime contact provided the trust between the researcher and interviewees, and participants could understand the environment and they could review their answers by our coding to find out possible mistakes [26]. These interviews were conducted online by Skype in Persian language.

The second method used was survey, a short questionnaire distributed among the Iranian students studying in Moscow. N=100 students were randomly chosen and questionnaires were distributed, candidates could choose few answers by ticking the scale based measurement. Moreover, they could add their own options. A questionnaire with 35 questions was designed (two parts including demographic questions and scale based questions) and distributed, during the filling process, we used a short face to face talk in order to ensure that the answers were given properly and then our results were tested in SPSS software.

4. Results

Reliability is the fact that shows consistency of the result [27]. Reliability refers to a measure which is free of any error, a result is considered as reliable when $XR = 0$. A research is reliable when a coefficient alpha value is more than 0.6 but cut-off point of 0.7 is more suitable [27] and any other amount under this, is considered as unsatisfactory internal consistency reliability.

Table 2 briefly shows the demography of the respondents obtained from the questionnaire. It illustrates that majority of the respondents were males with proportion of 67 persons, and 95 of the respondents were single. The result in our questionnaire for the marital status (single, married, widowed, separated and divorced) shows that there is no one divorced, widowed or separated. The age cluster of this demography dominates that number of our majority which is 81 were from 18-24 years old, that is because of the students in universities are around this age, who are mostly studying dentistry following by medical studies by 65 and 21 persons. Moreover we asked them the average monthly income of themselves or their families, and it is shown that 66% of them have the average monthly income of 1500\$ and more.

Table 2. Demographic Profile.

Gender		
	Frequency	Percent
Male	67	67%
Female	33	33%
Total	100	100%
Marital status		
Married	5	5%
Single	95	95%
Total	100	100%
Age		
18-24 years old	81	81%
25-29 years old	19	19%
Total	100	100%
Education		
Master	12	12%
PhD	2	2%
Medical studies	21	21%
Dentistry	65	65%
Total	100	100%
Monthly Income		
500-999\$	5	5%
1000-1499\$	29	29%
1500\$ and more	66	66%
Total	100	100%

Source: SPSS software, results from the survey

Table 3 Shows the descriptive statistics of this study which the mean, standard Deviation and Variance of all the variables are shown. This is the mean, standard deviation and variance of the average of all the questions in our variables that as you can see military services following by hopes for future with means of 4.4060 and 4.3440, respectively have the highest mean between our independent variables, and Infrastructure with mean of 4.3150 has the lowest mean. Moreover the standard deviation of this study has the highest amount with 0.57592 for military services and lowest amount for Gender discrimination with 0.38579. In this research we also asked women opinion about the military services for men and we also asked men to give their opinions about the gender discrimination.

Table 3. Descriptive Statistics.

	N	Mean		Std. Deviation	Variance
	Statistic	Statistic	Std. Error	Statistic	Statistic
AveMs	100	4.4060	.05759	.57592	.332
AveGD	100	4.3160	.03858	.38579	.149
AveHp	100	4.3440	.04441	.44411	.197
AveUN	100	4.1960	.04619	.46186	.213
AveINF	100	4.1300	.04894	.48938	.239
AveBR	100	4.4500	.03922	.39222	.154
Valid N (listwise)	100				

Source: SPSS software, results from the survey

Table 4 shows the result of our model summary with $R^2 = 0.244$. This result shows that Military service, Gender discrimination, Hope for future, unemployment, and Infrastructure; explain 24.4

percent of the emigration of the high skilled and educated work forces from Iran with Durbin-Watson of 2.237.

Table 4. Model Summary.

Model	Change Statistics					Durbin-Watson
	R Square Change	F Change	df1	df2	Sig. F Change	
1	.244 ^a	6.079	5	94	.000	2.237

a. Predictors: (Constant), AveINF, AveHp, AveGD, AveMs, AveUN

b. Dependent Variable: AveBR

Source: SPSS software, results from the survey

Table 5 shows our significant level in this study that is at <0.05 level. Where the highest significant level in this study is 0.004 followed by 0.018. The results in this research show that:

H1. Military service for men has a significant positive influence on brain drain, people think that military service is too long and unnecessary for them, in addition they believe that it actually wastes two years of their lives while they could do more important things in this period so they believe that participating in it is a huge mistake. The significance level for this hypothesis influencing on brain drain is 0.004 with Cronbach's Alpha = 0.901.

H2. Gender discrimination for women has a significant positive influence on brain drain respondents believe that gender discrimination in Iran is visible and women are suffering more than men which jeopardizes human rights along with their economic, social and political rights. The significance level for this hypothesis influencing on brain drain is 0.018 with Cronbach's Alpha = 0.735.

H3. Hope for the future has a significant negative relationship with brain drain respondents also accepted that their future in Iran is uncertain and political, social and economic instabilities jeopardizes their future and this uncertainty wastes their young hood. The significance level for this hypothesis influencing on brain drain is 0.039 with Cronbach's Alpha = 0.798.

H4. Unemployment rate has a significant positive relationship with brain drain is not supported by this research, and it can be possible, because most of the respondents were students and they were not actually looking for any jobs, or they don't have enough correct information about the employment. The significance level for this hypothesis influencing on brain drain is 0.605 with Cronbach's Alpha = 0.814.

H5. Insufficient infrastructure either at the level of the universities or at the level of society has a negative relationship with brain drain is also not supported by this study, this can be possible too. Because most of them did not attend in any university in Iran, they are not familiar with the existing infrastructures in the universities, and they don't precisely know the higher education system of Iran. The significance level for this hypothesis influencing on brain drain is 0.228 with Cronbach's Alpha = 0.786.

Results from interviews show that, those who have emigrated at least for now are not willing to return back to Iran, if the current social, political and economic problems remain the same. And those who have returned back are again looking for emigration if they can find better job opportunities abroad. None of them have attended military service, and they too consider it as a waste of time. They are fully satisfied with their own situations abroad, two of them are working in companies and their monthly salary is more than 3000\$, two of them are receiving more than 2000\$ monthly scholarships from the universities.

Table 5. Correlations.

		AveMs	AveGD	AveHp	AveUN	AveINF	AveBR
AveMs	Pearson Correlation	1	.020	.143	-.260**	-.149	.288**
	Sig. (2-tailed)		.840	.154	.009	.139	.004
	N	100	100	100	100	100	100
AveGD	Pearson Correlation	.020	1	.159	.257**	.095	.236*
	Sig. (2-tailed)	.840		.115	.010	.348	.018
	N	100	100	100	100	100	100
AveHp	Pearson Correlation	.143	.159	1	.109	-.005	-.206*
	Sig. (2-tailed)	.154	.115		.279	.959	.039
	N	100	100	100	100	100	100
AveUN	Pearson Correlation	-.260**	.257**	.109	1	.342**	-.052
	Sig. (2-tailed)	.009	.010	.279		.000	.605
	N	100	100	100	100	100	100
AveINF	Pearson Correlation	-.149	.095	-.005	.342**	1	.122
	Sig. (2-tailed)	.139	.348	.959	.000		.228
	N	100	100	100	100	100	100
AveBR	Pearson Correlation	.288**	.236*	-.206*	-.052	.122	1
	Sig. (2-tailed)	.004	.018	.039	.605	.228	
	N	100	100	100	100	100	100

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

*. Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS software, results from the survey

Moreover, they count that they could achieve their human rights in western countries, they are feeling respected and they could freely do whatever they want. They do not feel discriminated and they don't think that women are discriminated in these societies. Generally they are not hopeful with the future of Iran, they believe that since this regime is not changed, nothing special would happen, and uncertainty will remain, so they believe that political instabilities, suppressions and restrictions are the first factors influencing on other factors such as social, economic and etc.

Interviewees answered that unemployment for them in Iran, could not be a problem, if they would return back, although they are not going to be satisfied with the salary. But they are uncertain that, if they studied inside Iran's higher education system they could have the same situation as they have now, because, research laboratories, scientific level of specific specialties, infrastructures, internet access, and instruments are not as good as western countries.

5. Conclusion

To conclude, in this research paper has been tried to look at brain drain from a new perspective, and it was tried to explain this complex problem as easy as possible. We used a combination of interview (6 persons) and a survey for a sample of 100 to examine the determinants of the brain drain, our results showed mostly the push factors of brain drain, we found that, military service for men, gender

discrimination, hope for future are influencing on brain drain, while we are unable to certainly confirm that unemployment and infrastructure are factors of brain drain.

Of course there is no doubt that in our globalized world brain drain is influenced by socio-economic and political conditions. But also, individuals themselves, and many personal factors are affecting on this phenomena, although people may not want to emigrate, different conditions force them to do so unwillingly, because their governments were unable to satisfy their needs and provide them the life that they were actually deserved. Development requires steady planning, nurturing the skilled forces, retaining them and using them, therefore, skilled workers are most important human capital of a country and by their emigration, home countries may suffer.

Although Iran's advancement in science and research is visible in these days, bad international, political and economic relations are destroying the talents, resources and human capitals. Therefore, internal factors along with the international factors not only have encouraged the high skilled and educated Iranians to leave, but also have encouraged those who have potential to be a capital, unskilled and less skilled workers to leave as well. Poor facilities, instruments, laboratories, bureaucracy, corruption and etc. are the main factors discouraging individuals to stay. For those who wish to return back, governments' inability to properly use their knowledge and inappropriate business climate is influencing on their decision making. While by their presence, they could push the country towards development and efficiency. And governments by fixing emigration policies could effectively provide higher standards of living for them.

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