How to cite this paper: Yedigaryan, K. (2023). Analysis of the Globalization of Human Capital on the Example of the Republic of Armenia. *Messenger of ASUE, 1*(73), 73-86. DOI: 10.52174/1829-0280_2023.1-73
Received: 15.02.2023. ***Revision:*** 16.03.2023. ***Accepted:*** 09.06.2023.

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ANALYSIS OF THE GLOBALIZATION OF HUMAN CAPITAL ON THE EXAMPLE OF THE REPUBLIC OF ARMENIA

Human capital is a stock of health, knowledge, skills and abilities formed and accumulated through investments, which is expediently used in the labor process, contributing to an increase in labor productivity and income. As a type of capital, human capital (hereinafter referred to as HC) is quite flexible in terms of globalization. As the banking and financial system plays an important role in the movement of funds, so does the migration of the HC mobility. That is why it is important to understand the relationship between migration and HC.

Developing countries (for example, the Republic of Armenia) are still lagging behind in the creation and effective use of HC, there are not enough conditions for creating a favorable environment for employees providing them with high wages, and ensuring professional growth. The latter is the main reason for the mobility of HC to move from one country to another, in order to use their own HC more efficiently.

The study of the international movement of HC can be useful in the process of HC developing policies, implementing reforms in the areas of education, health care and social protection. The results of the work give an opportunity to develop a migration policy in the interests of the RA economy.

Keywords: *human capital, migration, labour market, income, mobility*
JEL: F22, J24
DOI: 10.52174/1829-0280_2023.1-73

Introduction. The role of HC, the expansion of its structure and functions brings a necessity of the formation of a new concept. In comparison with other factors of production that change quantitatively and qualitatively but remain the same in terms of content, HC changes in essence generate new knowledge. In the era of the information revolution, the need to accumulate and develop HC is reflected in the economic policy priorities of the developed countries, which are gradually paying more attention to education and public health.

According to the human capital index calculated by the World Bank, the RA ranks 82nd among 189 countries with an index of 0.6 (World Bank, Human Capital Index, 2020) which means that we are lagging behind many countries in the world on this

indicator. According to the GlobalEconomy.com website, the Brain Drain index 2021, Armenia ranks 42nd among 177 countries with a coefficient of 6.7, which is a fairly high indicator.

From the viewpoint of the globalization of HC, we are mostly interested in the impact of migration on the labor market of the country. The RA is not a leading industrial country, it has no access to the sea, and has an unfavorable geographical position, so the purpose of the given article is to study HC as a factor of internationalization of the RA economy.

Literature review. S. Fan and O. Stark (2013) argue that, theoretically, the migration of HC has a negative impact on the income of the labor force remaining in the country, since labor efficiency decreases. In this case, the employer must make a choice between the unemployed and the employed. L. Shkuflich and V. Vuckovic (2018) show that emigration leads to an increase in unemployment if there are those who leave the country among the employed, and if the gap between the qualifications of the remaining labor force and the outgoing labor force is large. According to B. Elsner (2015) the impact of emigration on income largely depends on the qualifications and quantity of the workforce.

J. Groisard and J. Lull (2006) argue that the future impact of migration of HC, if any, is very small and does not compensate for the losses that the country suffers in short-term capital. In any case, if a country fails to prevent migration, the result is a know-how and an exchange of experience (Mayr, K. and G. Peri, 2009).

Thus, people who study at foreign scientific centers and universities share their experience to a large extent, and the scientific diaspora as a whole has an unprecedented impact on the development of the country. In the case of the RA, the diaspora has repeatedly proven this, and this is not only about the scientific diaspora. Returned migrants often create scientific centers, structures, and engage in entrepreneurial activities.

There are also economic schools that believe that not only migration affects HC, but vice versa, that is, they are interconnected and have a causal relationship. International experience shows that investing in HC can significantly affect the migration behavior of people and vice versa, migration flows, in their turn, affect the HC of a given country.

Some economists believe that higher education in these countries will lead to overtraining and underutilization of specialists. Of course, this does not mean that we should not invest in education, on the contrary, we should train personnel who will subsequently dictate market conditions, we should prepare entrepreneurs, and develop a long-term strategic investment plan in the direction of being a recipient, not a donor of migration. Both qualified and unskilled people are leaving the RA. However, there are no convincing statements about the connection between migration and HC in the economic literature. This issue remains controversial.

Ch. Dustmann and A. Glitz (2011) refer to the work of L. Sjaastad (1962), according to which the decision to migrate cannot be considered in isolation, additional investments in HC are as important as the migration process itself, and sometimes even more important. They argue that the decisions to migrate and to invest in HC are interrelated and that these decisions matter not only for those who leave the country, but also for those who stay there. In their view, it matters who decides to migrate, and the quality of HC in a given country can vary depending on whether or not there is a brain drain or brain gain in that country.

The literature of the last decade argues that skilled workers tend to emigrate to developed countries in the hope of earning higher wages. Typically, a skilled workforce widens the gap between rich and poor countries, making rich countries even richer and poor countries even poorer. Just as in the previous century the flow of financial capital

and the facilitation of its movement greatly changed the international economic environment, it is possible that in the near future this change will be caused by HC.

D. Kapoor and J. McKeil (2005) argue that migration flows are driven by three powerful long-term capitalist trends in attracting migrants: the government policies of rich countries, the deepening globalization of production and trade, which creates great opportunities for the division of labor, and the fact that the integration of capital markets breeds integration of the labor market.

Separate works on HC appeared in Armenian literature only in the 21st century. Our contemporaries G. Gharibyan, Z. Tadevosyan, F. Mayilyan, A. Hovhannisyan, A. Kharatyan, R. Isahakyan, subjecting to a deep analysis of HC, touched upon the issues of its development, reproduction and evaluation in the RA, the features of its implementation.

Perhaps the first who tried to measure HC was W. Patty. He believed that labor was the basis of wealth and that its value should be included in the assessment of national wealth. He tried to calculate HC using the income method, capitalizing wages. L. Dublin, A. Lotka, N. Farr, A. De Foville, A. Barriol, I. Fisher, A. Woods, B. Kiker were also proponents of the income method.

The next method was the cost method created by E. Engel, which was based on the calculation of costs or investments made in HC (E. Engel, K. Dagum, S. Slottje, V. Pareto, Ph. Mahlup):

According to the Jorgenson-Frauman method (Jorgenson, D. and Fraumeni B., 1989), HC is calculated as follows: the total life income (V) of a person of a certain gender, age and education is:

$$V_{s,a,e} = Y_{s,a,e} + S_{s,a+1}V_{s,a+1,e}(1+g)/(1+i)$$

where Y is annual earnings and a S_{a+1} is the probability that the person will survive another year. The real income growth rate and the discount rate during one year period are denoted respectively by g and i . Jorgenson and Fraumeni identified five stages of the life cycle: no school and no work (ages 0-4), school but no work (5-13), school and work (14-34), work but no school (35-74), and no school or work (75 and older). By assumption, the lifetime income for the oldest group is zero, so is the annual income of those in the first two stages.

We are studying the globalization of HC, so the most acceptable calculation option is the formula proposed by T. Mitze, which includes migration and labor market indicators. T. Mitze (2012) followed the model of J. Harris and M. Todaro (1970), which is based on the differences between the expected incomes of countries of origin and destination and differences in the economic behavior of an individual arising from the employment possibility.

According to this model, the expected income in the country of origin is Y_{ii}^{E} , and the real wage rate is $i(Y_i)$, the probability of finding a job is $Pr(Emp_i)$, which can also be considered as a function of labor utilization in country i, other economic and non-economic factors: X_i. Similar designations were made for country designation j. In this case, a person decides to move from country i to country j if:

$$Y_{ii}^{E} < Y_{ij}^{E} - C_{ij}$$

Where Y_{ii}^{E} is the expected income in the country of destination, C_{ij} costs associated with moving from one country to another.

Methodology. In order to describe the entire perspective of the globalization of HC under the influence of migration, we examined the impact of migration on labor market indicators: wages (income), participation in the labor market and labor underutilization, since the accumulation of HC is focused on participation in the labor market, efficient use of HC and income accumulation. In their turn, differences in these indicators are main drivers of HC mobility.

Net migration data have been taken from the UN database (UN Population Division Data Portal, 2022) for all countries. The average wages from the database of the Organization for Economic Cooperation and Development (OECD Data Portal, 2022) and for the RA and the RF from the Federal State Statistics Service of the RF (RG FSSS) and the Statistical Committee of the RA (SC RA), respectively. Labor force participation and labor underutilization rates for all countries have been taken from the International Labor Organization database (ILO).

The World Bank includes the following indicators into the HC index - average years of schooling, life expectancy to age 5, healthy growth, standardized test scores, or adult life expectancy index as the main components of HC. From the point of view of the globalization of the HC, the indicator of education is more important for us, since the subject matter of the given article is the migration of the population of working age, and the latter is mainly based on education. Thus, as an indicator of HC, we choose the average number of years of education calculated by UNESCO (excluding years spent on repeating a year course), or rather the average number of years of education of the population over 25 years old, since migration covers precisely this age group (UNESCO). The data collection of the study was carried out for Armenia as a country of origin, the USA, Russia, France, Germany, Spain, the Netherlands and Portugal, as countries of destination. Most of the countries that are targets for migrants from the RA do not have data on how many Armenians live in this country, and if there were, then, naturally, this would be unreliable data, since many of our compatriots live in other countries on illegal grounds. The SC of the RA has presented the countries which Armenians are leaving for, but this is not the reason for us, because we are interested in labor migration. For example, Georgia is among the top five registered inter-state movements from Armenia, but it is no secret that Armenians go to Georgia not for labor migration, but for the purpose of organizing their rest, so in this list we have chosen such countries, which by their level of development and above-mentioned indicators significantly exceed the RA and naturally attract Armenians in terms of labour migration. The basis for choosing destination countries can also be money transfers sent to the RA, but the CB of the RA generally keeps statistics only for the USA and Russia, where the largest number of transfers come from.The calculations were made for 2010-2021, since before 2010 and after 2021 some indicators for the RA were not calculated. The equations we used should show the correlation between the indicators of origin and destination countries.

When calculating the relationships and adjustments of labor market indicators and migration of countries i and j Mitze proposed to produce the following equation.

$$MNET_{ij,t} = \alpha_{10} + \alpha_{11} * (L)MNET_{ij,t-1} + \alpha_{12} * (L)W_{ij,t-1} + \alpha_{13} * (L)LF_{ij,t-1} + \alpha_{14} * (L)LU_{ij,t-1} + \alpha_{15} * (L)HC_{ij,t-1} + \varepsilon_{ij,t}$$

where $MNET_{ij,t}$ reflects logarithmic differences between net migrations of country i and country j for the given time periud. The indicator variables ij refer to the logarithmic differences of the respective variables for countries i and j, t is the time indicator, L is the value of the lag, W is real wages, LF is labor force participation, LU is labor underutilization, HC is a HC. So our VAR model looks as follows:

$$\Delta MNET_{ij,t} = \alpha_{10} + \alpha_{11} * (L)\Delta MNET_{ij,t-1} + \alpha_{12} * (L)\Delta W_{ij,t-1} + \alpha_{13} * (L)\Delta LF_{ij,t-1} + \alpha_{14} * (L)\Delta LU_{ij,t-1} + \alpha_{15} * (L)\Delta HC_{ij,t-1} + \varepsilon_{ij,t}$$

where the subscripts ij indicate the logarithmic differences between countries of origin i and countries of destination j, t is the time index, and L is the lag value.

The remaining equations of the VAR model can be presented in the following way:

$$\Delta W_{ij,t} = \alpha_{20} + \alpha_{21} * (L)\Delta MNET_{ij,t-1} + \alpha_{22} * (L)\Delta W_{ij,t-1} + \alpha_{23} * (L)\Delta LF_{ij,t-1} + \alpha_{24} * (L)\Delta LU_{ij,t-1} + \alpha_{25} * (L)\Delta HC_{ij,t-1} + \varepsilon_{ij,t}$$

$$\Delta LU_{ij,t} = \alpha_{30} + \alpha_{31} * (L)\Delta MNET_{ij,t-1} + \alpha_{32} * (L)\Delta W_{ij,t-1} + \alpha_{33} * (L)\Delta LF_{ij,t-1} + \alpha_{34} * (L)\Delta LU_{ij,t-1} + \alpha_{35} * (L)\Delta HC_{ij,t-1} + \varepsilon_{ij,t}$$

$$\Delta LF_{ij,t} = \alpha_{40} + \alpha_{41} * (L)\Delta MNET_{ij,t-1} + \alpha_{42} * (L)\Delta W_{ij,t-1} + \alpha_{43} * (L)\Delta LF_{ij,t-1} + \alpha_{44} * (L)\Delta LU_{ij,t-1} + \alpha_{45} * (L)\Delta HC_{ij,t-1} + \varepsilon_{ij,t}$$

$$\Delta H_{ij,t} = \alpha_{50} + \alpha_{51} * (L)\Delta MNET_{ij,t-1} + \alpha_{52} * (L)\Delta W_{ij,t-1} + \alpha_{53} * (L)\Delta LF_{ij,t-1} + \alpha_{54} * (L)\Delta LU_{ij,t-1} + \alpha_{55} * (L)\Delta HC_{ij,t-1} + \varepsilon_{ij,t}$$

It is advisable to calculate this model of equations using a vector autoregression (VAR) model. The VAR model is flexible enough to help draw conclusions about the dynamic changes and interactions of several factors (covariates) over time, which depend both on their time lag and on other factors.

Analysis. In the context of the internationalization of HC, we consider the interaction of migration and HC to be important. However, the situation is greatly influenced by labor market conditions in the countries of origin and destination, especially the level of wages, the level of participation in the labor market and the level of underutilization of the labor market.

Let's look at the levels of the above mentioned indicators in the RA.

Table 1

Indicators of net migration, HC, income, labor force participation and labor underutilization in the RA in 2010-2021 [1]

Date	Net migration (a thousand people)	HC (years)	Wage ($, year)	Labor force participation (%)	Labor underutilization (%)
2010	-31.99	11	3,298	62.5	37.5
2011	-29.21	11.19	3,479	62.9	36.1
2012	-28.73	11.25	3,377	63	34.9
2013	-28.26	11.26	4,292	63	34.2
2014	-27.76	11.74	4,569	62	36.1
2015	-27.28	11.57	4,308	60.5	36.7
2016	-26.80	11	4,358	59.8	34.5
2017	-26.33	11.19	4,421	59.2	34.6
2018	-25.84	11	4,291	56.5	35.3
2019	-25.36	11.8	4,564	57.1	35.3
2020	-12.83	11.33	4,652	54.3	35.3
2021	-12.83	11.39	4,866	54.7	35.3

Net migration in the RA in recent years has always had a negative value, which means that more people emigrate from our country, that is, by its nature, the RA is a country of origin for migrants.

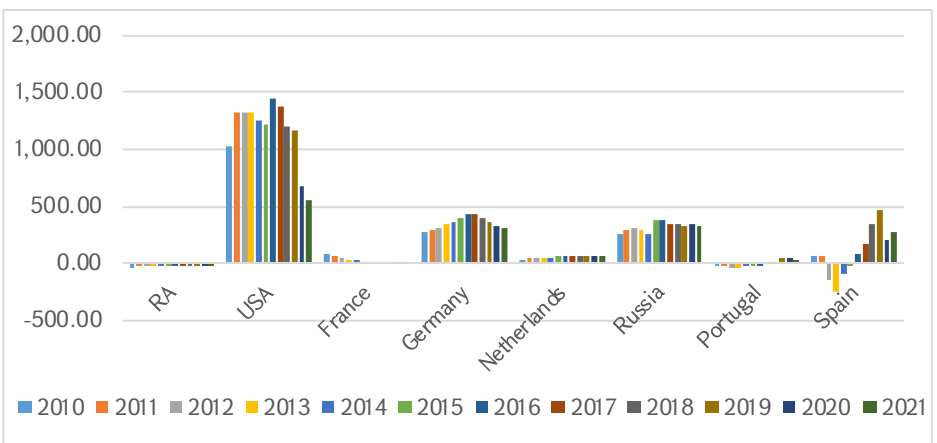


Figure 1. ***Net migration in 2010-2021*** [2]

[1] Table 1 is compiled by the author based on UN Population Division Data Portal, UNESCO, RASC, ILO databases

[2] The chart compiled by the author is based on UN data, United Nations, Data portal, Population Division, Total-net Migration,

The average number of years of education in the Republic of Armenia for the population over 25 is 11 years on average, which is a fairly good indicator compared to other countries.

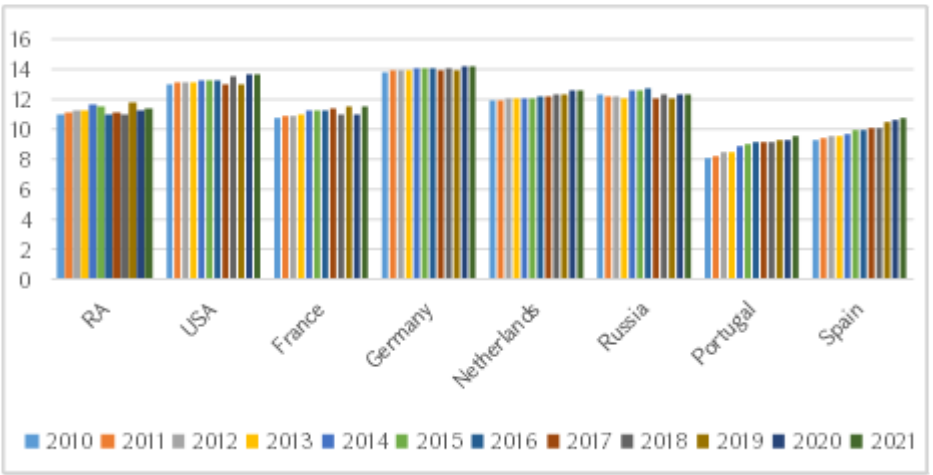


Figure 2. ***Human Capital 2010-2021***[3]

From the point of view of income, the average annual salary in dollars was chosen. In the RA, the average salary for 10 years has increased by only $1,500 and currently stands at $4,866, which is quite small compared to destination countries.

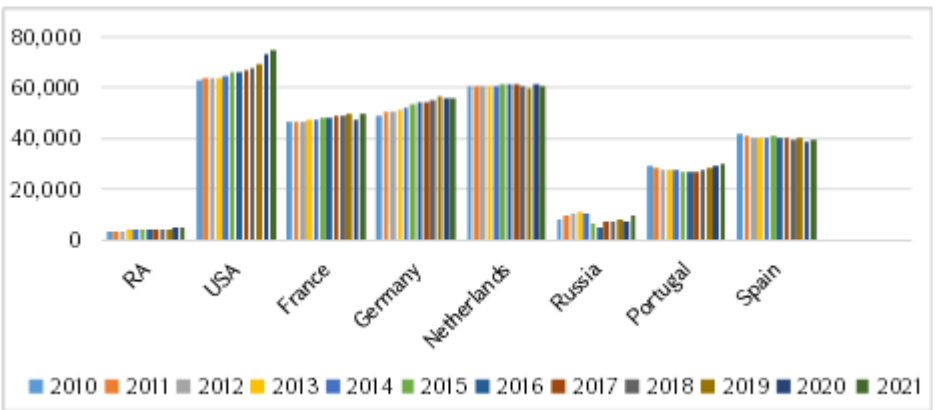


Figure 3. ***Average annual wages 2010-2021***[4]

The share of the labor force (involvement in the labor market) among the working-age population in the RA is 54.7%, and the indicator of underutilization of the labor force is 35.3%. According to these indicators, we are quite far behind developed countries.

[3] The chart was compiled by the author based on UNESCO data, UNESCO, Mean years of schooling, http://data.uis.unesco.org/Index.aspx.

[4] The chart was compiled by the author based on data from the UN database, the Statistical Committee of the Republic of Armenia and the Federal Statistical Service of the Russian Federation.

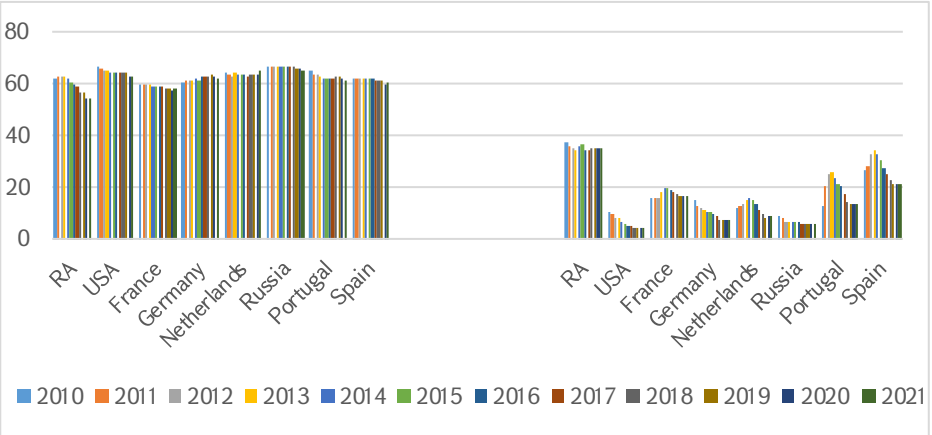


Figure 4. ***Labour force participation and labour underutilization 2010-2021***[5]

Evaluation of a PVAR model requires the satisfaction of several criteria such as stationarity and reliability of the data. To clarify the issue of stationarity of the series more clearly, we performed an Augmented Dickey-Fuller Fisher Unit Root Test for each variable. As a result, it turned out that some of the variables do not satisfy the stationarity condition. To avoid this, the calculation was made on the basis of first-order differentials of the growth rates of indicators, as a result of which all indicators satisfied the stationarity condition.

Summary statistics of indicators are presented in Table 2.

Table 2

Summary statistics

	MNET	*WAGE*	*LU*	*LFP*	*HC*
Mean	0.023153	0.003624	0.023171	0.000357	0.001875
Median	0.015668	0.009478	0.000000	0.002635	0.004791
Maximum	104.0868	0.616720	0.210559	10.09204	0.198283
Minimum	102.2147	0.403334	0.990654	9.179095	0.158721
Std. Dev.	17.58788	0.146560	0.154856	1.646129	0.067757
Skewness	0.164383	0.499574	3.782110	0.829809	0.158977
Kurtosis	34.80900	6.574940	23.53726	34.98659	3.250851
Jarque-Bera	2951.436	40.18728	1397.073	2992.197	0.478395
Probability	0.000000	0.000000	0.000000	0.000000	0.787259
Sum	1.620735	0.253677	1.621991	0.025006	0.131275
Sum Sq. Dev.	21344.02	1.482116	1.654644	186.9721	0.316775

Another condition is stability. The inverse roots of the characteristic polynomial carry out the stability. This procedure is extremely important because the non-stationary model is not significant. The model is considered stable if the modules of the inverse roots of the characteristic polynomial are less than 1. Figure 5 represents the values of the inverse roots of the characteristic polynomial by constructing a unit pie chart.

[5] The chart was compiled by the author based on data from the International Labor Organization,

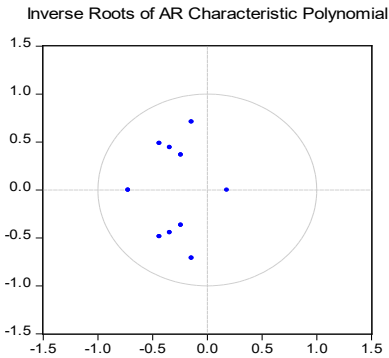


Figure 5: ***Graph of the inverse roots of the characteristic polynomial***

As we can see, all points are inside the circle, so the values are less than 1. This means that there is no instability in our model.

We consider the structure of the model lag according to several criteria - Akaikey, Schwartz, and Hannan-Quinn criteria.

Table 3

Lag Selection Criteria for Vector Autoregression

Lag	*LogL*	*LR*	*FPE*	*AIC*	*SC*	*HQ*
0	12.85906	NA	1.61e-06	0.850431	1.057297	0.926256
1	56.73029	119.2960	1.95e-07	1.272871	0.031678	0.817925
2	86.66244	44.18556	1.62e-07	1.507735	0.767785	0.673667
3	116.5014	36.94342	1.48e-07	1.738160	1.571687	0.524970
4	205.0685	88.56711*	9.60e-09*	4.765165*	0.420991*	3.172854*

Table 3 shows that all criteria require the choice of the 4th lag. However, it is necessary to evaluate the presence of autocorrelation in model errors. To do this, we will perform a vector autoregressive residual serial autocorrelation test (VAR Residual Serial Correlation LM tests). As a result, it turns out that for the 1st, 2nd, 3rd lags, the hypothesis of 0 probability is rejected, and for the 4th lag, the probability of 0.74 is confirmed. Therefore, we choose the 4th lag.

We also ran a Granger causality test to see how well the variables explain each other. Under the null hypothesis, variable X does not explain the behavior of variable Y. The test shows that migration and income levels are best explained by labor underutilization, labor underutilization by migration, labor market participation by HC, HC by labor underutilization, and income levels. At general levels, the test shows that the variables we have chosen explain each other.

Table 4

Sequential Autocorrelation Test for Vector Autoregressive Residuals

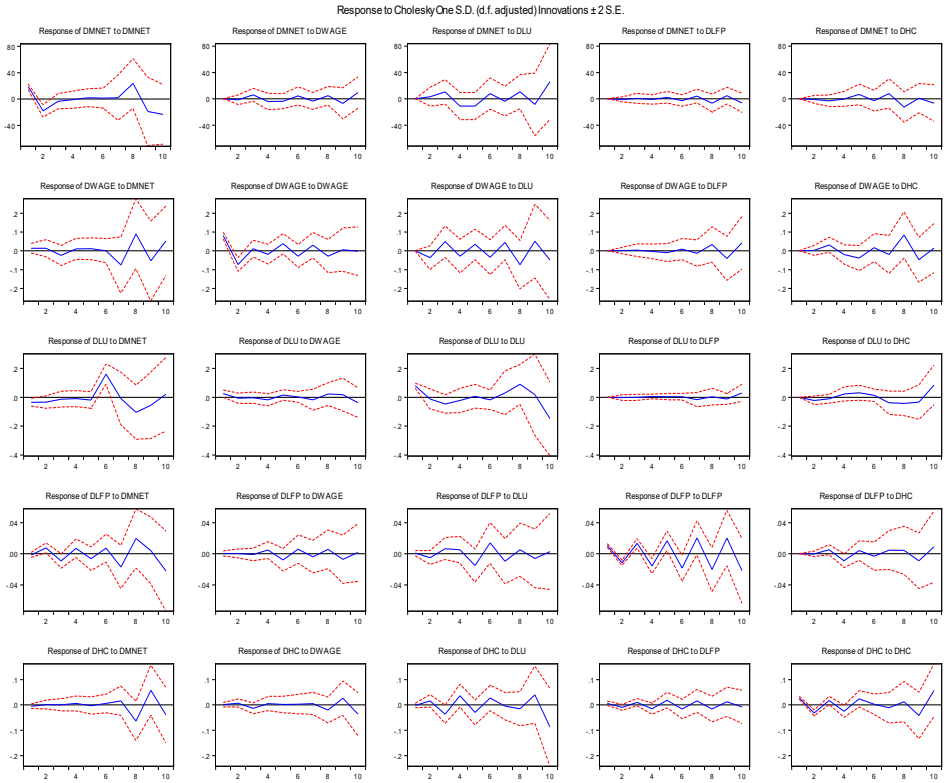
Null hypothesis: No serial correlation at lag h						
Lag	*LRE* stat*	*df*	*Prob.*	*Rao F-stat*	*df*	*Prob.*
1	67.37282	25	0.0000	3.152174	(25, 135.2)	0.0000
2	57.96931	25	0.0002	2.620717	(25, 135.2)	0.0002
3	55.22312	25	0.0005	2.471829	(25, 135.2)	0.0005
4	20.02236	25	0.7457	0.790857	(25, 135.2)	0.7479
Null hypothesis: No serial correlation at lags 1 to h						
Lag	*LRE* stat*	*df*	*Prob.*	*Rao F-stat*	*df*	*Prob.*
1	67.37282	25	0.0000	3.152174	(25, 135.2)	0.0000
2	166.6610	50	0.0000	4.877656	(50, 144.7)	0.0000
3	217.7680	75	0.0000	4.695472	(75, 128.8)	0.0000
4	265.2841	100	0.0000	4.788128	(100, 107.1)	0.0000

Next, we will carry out a detailed analysis of impulses and responses of variables. As a result of such an analysis, it becomes clear what effect one standard deviation of the change in the variables included in the model, impulses, will have on the model. The analysis was carried out using impulse responses and their dispersion decomposition using the Cholesky method. Impulses and responses in standard deviation are shown in Figure 6, the decomposition of the variance is shown in Figure 6 as well. To understand the interaction of variables in short, medium and long-term capitalizations, we discussed them in years 1, 5 and 10. Figure 6 illustrates the abovementioned.

Table 5

Granger Causality Test

Dependent variable: MNET			
Excluded	Chi-sq	df	Prob.
WAGE	1.893041	4	0.7554
LU	9.746257	4	0.0449
LFP	2.459471	4	0.6519
HC	4.402040	4	0.3543
All	15.15005	16	0.5137
Dependent variable: WAGE			
Excluded	Chi-sq	df	Prob.
MNET	0.751176	4	0.9449
LU	20.46579	4	0.0004
LFP	2.695106	4	0.6101
HC	5.797847	4	0.2148
All	40.10568	16	0.0008
Dependent variable: LU			
Excluded	Chi-sq	df	Prob.
MNET	83.69932	4	0.0000
WAGE	1.253835	4	0.8692
LFP	1.226620	4	0.8737
HC	6.469064	4	0.1668
All	104.0686	16	0.0000
Dependent variable: LFP			
Excluded	Chi-sq	df	Prob.
MNET	4.991365	4	0.2882
WAGE	2.810186	4	0.5901
LU	6.395651	4	0.1715
HC	11.74739	4	0.0193
All	92.77622	16	0.0000
Dependent variable: HC			
Excluded	Chi-sq	df	Prob.
MNET	0.495204	4	0.9740
WAGE	13.16432	4	0.0105
LU	15.33180	4	0.0041
LFP	1.576132	4	0.8131
All	57.13773	16	0.0000



Fgure 6. ***Answers in standard deviation***

Table 6

Cholesky method of decomposition of responses by standard deviation

Variance Decomposition of DMNET:						
Period	*S.E.*	*DMNET*	*DWAGE*	*DLU*	*DLFP*	*DHC*
1	18.73934	100.0000	0.000000	0.000000	0.000000	.000000
5	34.21808	58.15983	6.013602	30.60058	0.690367	4.535624
10	64.62220	51.37551	6.252144	31.30659	3.287797	7.777959
Variance Decomposition of DWAGE:						
Period	*S.E.*	*DMNET*	*DWAGE*	*DLU*	*DLFP*	*DHC*
1	0.082243	2.783563	97.21644	0.000000	0.000000	0.000000
5	0.153789	5.106212	58.08049	24.17597	0.434747	12.20258
10	0.272473	27.82180	21.89513	25.92418	6.569649	17.78923
Variance Decomposition of DLU:						
Period	*S.E.*	*DMNET*	*DWAGE*	*DLU*	*DLFP*	*DHC*
1	0.090169	14.71340	7.457572	77.82902	0.000000	0.000000
5	0.124511	19.22247	7.955418	59.03900	0.331728	13.45138
10	0.320709	41.84208	3.705664	39.55653	1.369172	13.52656
Variance Decomposition of DLFP:						
Period	*S.E.*	*DMNET*	*DWAGE*	*DLU*	*DLFP*	*DHC*
1	0.010787	2.097356	0.131774	0.493342	97.27753	0.000000
5	0.041598	13.85535	4.977367	18.81609	55.01883	7.332361
10	0.075503	25.84152	3.888906	12.01021	52.34292	5.916438
Variance Decomposition of DHC:						
Period	*S.E.*	*DMNET*	*DWAGE*	*DLU*	*DLFP*	*DHC*
1	0.028976	3.911768	0.057155	0.710205	4.284250	91.03662
5	0.091364	0.881742	3.294271	46.37254	9.770542	39.68090
10	0.191089	25.43682	7.552117	38.41379	5.018680	23.57860
Cholesky Ordering: DMNET DWAGE DLU DLFP DHC						

Figure 7. ***Cholesky method of decomposition of responses by standard deviation***

After evaluating the model, we carried out an analysis of impulses and responses, that is, we turned to the impulse response of a function (hereinafter referred to as IFR) and the prediction of the error distribution of Cholesky variables (hereinafter referred to as FEVD). As a result of this analysis, it is shown how changes in the value of 1 standard deviation of the variables included in the model affect the model. FEVD shows how the variables included in the system had been explained by the corresponding covariates. The IRF shows how variables will respond to a standard deviation shock for a given variable while keeping other variables constant.

In particular, for this study, we are interested in 3 types of IRF:

- The impact of gaps in labor market performance and education performance on shocks or impulses in net migration flows.
- Effect of net migration on other variables.
- The influence of the impulses of the variables listed above on the gaps in HC.

1. *IRF response of migration to labor market indicators.*

It is assumed that migration flows respond to labor market and education indicators. According to our model, the response to labor underutilization is particularly strong. The IRF also measures the impact of the wage gap on migration flows. It has also become clear from the model that just as the independent variables affect the dependent variable, migration also affects the other indicators discussed.

We consider the forecast error variance (FEVD), which helps us understand how much of the variance is due to the changes in that variable or other variables in the model. We consider outcomes at 1, 5, and 10 years after the initial shock. Naturally, most of the forecast error variance is explained by the variable's own changes (one time lag). However, over time, the variables begin to influence each other. Thus, the change in migration in year 1 is independent of any variable, in year 5 it is driven by income gap, labor underutilization, labor market participation gap and HC gap of 6.01%, 30.6%, 0.69%, 4.5%, respectively, after 10 years, respectively, by 6.25%, by 31.3%, by 3.2% by 7.7%. That is, all the variables we have listed have a stable and significant impact on the change in migration.

2. *Labor market and HC IRF response to migration shocks.*

First, looking at the econometric results of the effect of migration (as an explanatory variable) on other variables, we see a relatively larger effect on the wage gap and labor underutilization, and a relatively smaller effect on the other two variables.

The impact of migration on HC and labor market participation is negative and insignificant, i.e. migration, although it reduces gaps in HC and labor market participation between countries of destination and origin, is very insignificant even after 10 years.

Thus, the impact of migration on income gap, labor underutilization, labor market participation and HC gap in Year 5 is as follows: 5.1%, 19%, 13.8%, 0.88% , after 10 years - 27.82%, 41.8%, 25.8%, 25.4%, respectively. In other words, all the variables we have listed respond to changes during migration.

3. *The response of HC to migration and labor market indicators.*

In general, a widening income gap leads to an influx of HC and a widening of the gap. In our country, the opposite happens, although this is a very small effect. As migrants leave, they begin to send remittances home, thus reducing the income gap and the outflow of HC. So we see a small negative impact on the HC gap. The response of HC to a positive change in the level of income is negative and retains this character over time. It is assumed that a larger income gap between the host country and the country of origin can narrow the gap in HC between the two countries. Moreover, according to IRF, after 5 years this effect disappears altogether.

A change in labor underutilization has little negative impact on the HC gap 10 years from now. The response of HC to an increase in the labor market participation gap shows a non-linear relationship, characterized by an initial positive effect of labor market participation, and after period 1 the effect becomes negative.

Thus, the gap in HC is due to a gap in income levels, underutilization of the labor force and participation in the labor market after 1 year, respectively, by 0.05%, 0.7%, 4.25%, after 5 years by 3.2%, 46.3%, 9.7%, after 10 years - by 7.5%, 38.4%, 5.01%.

Conclusion. Skilled labor migration is gradually becoming more important in the context of global movements. This kind of influx of migration is most noticeable in developed countries, which have already begun to develop strategic steps to facilitate the entry of skilled labor into their country. Experience, accumulated statistical data allowed them to understand its positive economic consequences in their countries. As for developing countries, including the RA, the first priority here is to prevent the brain drain, and then to attract skilled foreign labor. At present, the RA faces the problem of accumulation and reproduction of the national intellectual capital. As a result, the country found itself at the border - critical threshold necessary for the accumulation and reproduction of national intellectual capital, which hinders the process of scientific and economic reforms. The tool for the internationalization of HC is the migration of HC, so it is necessary to evaluate the effects of HC and migration, which cannot be analyzed without taking into account the push and pull factors which are largely related to labor market indicators. By implementing a panel vector autoregressive model, we analyzed the relationships between HC, migration, labor income, labor market participation, and labor underutilization and found that:

- most of the variance of the listed variables is explained by their own variation,
- changes in migration mainly explain changes in labor force participation, but to a lesser extent changes in labor underutilization, HC and income,
- the income gap explains much of the underutilization of the labor force, as well as changes in the gap in HC,
- labor force participation rate explains labor underutilization, HC, and the income gap,
- labor underutilization explains gaps in HC and, to a lesser extent, labor market participation,

- Changes in the HC gap explain changes in the income gap, gaps in the labor market participation index and, to a lesser extent, changes in migration flows. Even taking into account the limited dispersion of migration flows, changes in the HC gap seem to be more important in explaining migration over time than in income and labor market participation.

According to the results of the study, it has become clear that migration, HC, labor income, underutilization and involvement in the labor market are closely interconnected, therefore, from the point of view of the internationalization of HC, it is important for us to create favorable conditions for increasing the above mentioned indicators in the Republic of Armenia. This is a valuable study confirming that migration and labor market rates affect HC and vice versa, and therefore can form the basis for the development of favorable policies in this area. In particular, to develop HC, it is important to improve not only education or healthcare, but also labor market indicators. Many economists argue that preventing migration will go a long way in boosting economic growth, an idea that is certainly not objectionable, but is a longer-term capital goal. Research proves once again that this can be done in long-term through the development of HC.

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