MULTIFACTORIAL ECONOMETRIC MODEL OF THE EFFECTIVENESS OF INTERSTATE MIGRATION GROWTH

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The world is experiencing a global intensification of migration processes in which the population is actively involved. In such conditions, there is an increasing need of effective state regulation and forecasting in this field, which is a precondition of the use of the positive migration potential for the development of the economy and its individual regions [1]. According to [2], Ukraine adopted the strategy of the state migration policy of Ukraine, the main purpose of which is to direct the efforts of the state and society to the formation and implementation of the state migration policy, which would have a positive impact on the consolidation of the Ukrainian nation and the security of the state, accelerate socio-economic development, contributed to the slowdown of depopulation, stabilization of quantitative and qualitative composition of the population, meeting the needs of the economy in the workforce, consistent with the international standards and international obligations of Ukraine [5-9]. According to the process results, the main indicators that affect the inter-state migration growth is the population of the country, the average life expectancy, average monthly salary, GDP per person and the volume of private transfers into the country (table. 1).

Table 1. Dynamics of the main indicators affecting migration growth (reduction) in Ukraine

Years	Interstate migratory growth (+), reduction (-), person	Existing population (person)	Average life expectancy of women and men at birth, years	Dynamics of average monthly salary, UAH	GDP per person (in actual prices), UAH	Volumes of private money transfers into Ukraine, UAH
2010	16,100	45,778,500	70.44	2,250	24,798	46,671,485,400
2011	17,100	45,633,600	71.02	2,648	29,980	56,080,406,200
2012	61,800	45,553,000	71.15	3,041	32,480	60,155,318,000
2013	31,900	45,426,200	71.37	3,282	33,965	68,236,241,000
2014	22,600	42,929,300	71.37	3,480	36,904	102,322,159,884
2015	14,200	42,760,500	71.38	4,195	46,413	167,020,641,653
2016	10,600	42,584,500	71.68	5,183	55,899	204,883,115,030
2017	12,000	42,386,400	71.87	7,104	70,374	261,895,257,813

Source: created by the author on the basis of data [2-4].

The correlation of the main indicators affecting the migration growth (reduction) in Ukraine is determined in the table below (table. 2).

Table 2. Correlation of the main indicators affecting migration growth in Ukraine

Indicators	Migratory growth, reduction	Existing population	Average life expectancy	Average monthly salary	GDP per person	Volumes of private money transfers into Ukraine
Migratory growth, reduction	1.0000	0.5191	-0.1793	-0.3908	-0.4243	-0.5131
Existing population	0.5191	1.0000	-0.7776	-0.8051	-0.8366	-0.8875
Average life expectancy	-0.1793	-0.7776	1.0000	0.8619	0.8673	0.8220
Average monthly salary	-0.3908	-0.8051	0.8619	1.0000	0.9949	0.9710
GDP per person	-0.4243	-0.8366	0.8673	0.9949	1.0000	0.9871
Volumes of private money transfers into Ukraine	-0.5131	-0.8875	0.8220	0.9710	0.9871	1.0000

Source: created by the author

These tables show that there is a correlation between all the selected indicators. The most highly positive correlation is characterized by such indicators as the average monthly salary, GDP per person and the volume of private transfers into Ukraine. A high positive correlation is observed between the average life expectancy and the average monthly salary (0.8619), GDP per person (0.8673), the volume of private transfers into Ukraine (0.8220). The weakest negative correlation is observed between migration growth (reduction) and average life expectancy. High negatively correlated relation between the existing population value and the average life expectancy (0.7776), average monthly salary (0.8051), GDP per person (0.8366), volume of private transfers into Ukraine (0.8875). There is an average positive (0.5191) and negative (0.5131) correlations between the migration growth (reduction) and the existing population indicator and the volume of private transfers into Ukraine, respectively. Such indicators as migration growth (reduction) and the average monthly salary and GDP per person have a negatively correlated relation, which indicates a decrease in one variable with an increase in the value of the other one. Using the statistical method of multiple regressions, the author constructed a multivariate econometric model of the dependence of migration growth (reduction) ($M_{G(R)}$) on the selected indicators, which is expressed by a 5-dimensional plane and is represented by the next form:

$$M_{G(R)} = 0{,}0162 \cdot N_{E.P.} + 69.4663 \cdot \overline{E_L} + 0{,}0400 \cdot \overline{S_{mon}} - 0.0041 \cdot GDP_{1\,p.} - 0.0155 \cdot PMT - 5{,}512.5959$$

where $N_{e.p.}$ – the number of the existing population; $\overline{E_L}$ – average life expectancy; $\overline{S_{mon}}$ – average monthly salary; $GDP_{1\,p.}$ – GDP per person; PMT – volumes of private money transfers to Ukraine.

The equation reveals that the incline of the plane in the direction of the existing population (-0.0089), the average life expectancy (-18877.2484), average salary (-33.9323) and volume of private transfers (0.0155) represent the negative sensitivity of migration growth (reduction) and the incline of the plane in the direction of the level of GDP per person (+11.14444) represents the positive sensitivity of migration growth (reduction). The validity of the obtained model is 0.5183, and standard error – 22,049.5403. Multivariate econometric model of migration growth (reduction) is based on the production function of knowledge.

It provides an opportunity to study the absolute and relative impact of factors on the value of migration growth (reduction), to determine the potential reserves of its increase (reduction), as well as to evaluate them through comparative analysis. That is, for example, if the number of the existing population will increase by 1% (will be 42,810.3 thousand people) with other constant indicators, migrants quantity will increase by 6,864 people (34.21%); if the average life expectancy increases by 1% (will be 72.59 years), with other constant indicators, there will be an increase of migrants by 49,923 (79.63%); if the average monthly salary increases by 1% (will be 7,174.83 UAH) with other constant indicators, there will be an increase of migrants by 2,841 people (by 17.66%); if the GDP per person increases by 1% (will be 71,078.20 UAH) with other constant indicators, there will be a reduction of migrants by 2,920 people (by 28.14%); if the volume of private transfers increases by 1% (will be 9,424.31 million dollars) with other constant indicators, migrants quantity will decrease by 1,448 people (by 12.24%). The constructed model will allow to predict the scenarios of migration movement in Ukraine.

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