# The impact of labour migration on labour productivity in the EAEU countries

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**Abstract.** The fluent labour resources transfer within an integration association affects not only the level of wages or employment, but also causes complicated, complex consequences for the labour donor countries. The purpose of the study is to assess the impact of labour resource spillovers on the level of labour productivity in the EAEU countries. Using correlation analysis, the paper verifies the hypothesis of the reverse spillover effect associated with the return of labour migrants to their home countries. It contributes to labour productivity growth in the EAEU countries. The results show statistically significant (multidirectional) relationship between the variables under study – labour migration affects the level of productivity in the EAEU countries. Indeed, the growth of labour migration positively affects the level of labour productivity in Armenia and Belarus. However, in Kazakhstan and Kyrgyzstan those is negative one. The research results can be used to develop a strategy of socio-economic development of the EAEU countries considering the parameters of external labour migration.

**Keywords:** labour migration; EAEU; spillover effects; labour productivity; correlation analysis

**JEL codes:** F22, F02, O15

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## Introduction

The relative freedom of labour mobility within the EAEU has both a direct impact on supply and demand balance in national labour markets and wage dynamics, and an indirect impact through the so-called spillover effects of labour migration. These effects are diverse ones: from the diffusion of knowledge and the accumulation of human capital to the challenges of crosscultural integration and diversity. One of the most controversial aspects of labour migration spillover effects is the impact of labour migration on labour productivity in labour donor countries. In the EAEU these are Belarus, Kazakhstan, Kyrgyzstan, and Armenia. We assumed that migration flows within this integration union are unidirectional ones – the labour force moves to the economy with higher wages, i.e. Russia.

On the one hand, the labour migration can have a positive impact on labour productivity in donor countries. It develops the labour shortages in the labour market resulting in the replacement of expensive labour with technology. Moreover, labour migrants' remittances can contribute to economic development through increased consumption and indirectly affect labour productivity in the donor country. Furthermore, migrants returning to their home country can act as providers of new knowledge and skills, etc.

Nevertheless, it is also necessary to consider the factors negatively affecting the level of labour productivity in the labour donor country. Indeed, the outflow of labour force may have a negative impact on

labour productivity in industries with a high dependence on low-skilled workers. For example, a significant outflow of workers from rural areas could cause labour shortages. It would slow the development of certain industries and reduce overall labour productivity. Moreover, the long-term outflow of young and healthy workers will have a negative impact on demographics, depopulate entire regions, deteriorate infrastructure and quality of life, and reduce the productivity.

The ambiguity of labour migration impact on labour productivity in the donor economy is considered in the economic literature.

According to Panshin, Markhaichuk & Yares (2019), the regression analysis confirmed hypotheses that higher level of labor migration from the region leads to a decrease in labor productivity in the region [1].

Laut, Pranizty & Sugiharti (2023) note, meanwhile, human capital spillover from indicators in-migration has no impact on productivity. These results indicate that knowledge spillover support by quality of human capital, but the movement of labor has not provided positive externalities for the surrounding environment [2].

Marois, Bélanger & Lutz (2020) highlight that high immigration volumes combined with both low education and integration leads to increasing economic dependency [3].

Imbert, Seror, Zhang & Zylberberg (2022) find that, when immigration increases, manufacturing production becomes more labor intensive and productivity declines. They show that rural-urban migration induces both labor-oriented technological change and the adoption of labor-intensive product varieties [4].

According to Calcagnini, Marin & Perugini (2021), migration flows of qualified human capital had a positive impact on total factor productivity (TFP) growth in the regions of destinations, while the number of emigrants have a positive effect on the TFP growth in the regions of origin [5].

Bassie, Sirany & Alemu (2022) based on the discriptive data consider the issue of the majority of respondents used their remittances for consumption, to acquire agricultural inputs, and to pay back their debts and tax payments. According to econometric studies, rural-urban migration has little influence on agricultural productivity. Remittances, cultivated land, livestock ownership, and extension services, on the other hand, have a positive and significant effect on agricultural productivity. In a nutshell, the link between migration, remittances, and agricultural output in agrarian and rural families is remarkable [6].

Antczak (2023) examines the issues of short-term (from one to three years) to labor-donor countries, international labor migration can bring some positive socioeconomic effects, such as a reduction in the level of unemployment in the domestic market of the country, reduction of payments from the state budget for the maintenance of the unemployed and employees of the budgetary sphere, an increase of revenues of money transfers. In the long-term period, international labor migration has extremely negative consequences for donor countries. Indeed, there is an outflow of economically active population to a permanent place of residence in other countries, which leads to an increase in the shortage of labor force in the national labor market (including in the health, education, science, equipment, and labor-intensive professions). Also, tax revenues to the state budget are reduced. Brain outflow means the loss of state resources invested in their education, the narrowing of industry, and the deterioration of the business environment. Reducing the number of able-bodied populations in connection with migration is also a significant fiscal problem. Pressure on public finances will take place on two channels: 1. increase the cost of programs related to age (pensions and health) factor; 2. the innovative potential of economic growth decreases [7].

According to results of Bongers, Díaz-Roldán & Torres (2022), human capital accumulation in the sending country is encouraged by the possibility of emigration to higher labor productivity countries, supporting the recent view of the 'brain gain' hypothesis. Productivity shocks hitting the hosting country reduce the human capital investment by natives but increase the human capital investment in the sending country when migration is allowed. Finally, we find that migration increases world human capital, increasing the stock of human capital in both hosting and sending countries [8].

Reserch made by Sarker, Salam & Firdaus (2024) examines the differences in farm productivity and technical efficiency between female and male labor migrants by focusing on female and male laborers who have lived away from their homes for 6 months or more within the country and its reflection on farm

production. The empirical result shows that the female-labor migrants' farms have 10.3% lower production frontier (maximum frontier yield) and 6.1% higher technical efficiency than male migrants' farms, indicating that they have 4.2% lower productivity. Lower production frontier reflects lower management ability and less attention to farm practice [9].

The purpose of the study is to assess the impact of labour resource spillovers on the level of labour productivity in the EAEU countries.

**Methods**

The hypothesis of the study is as follows: the return of labour migrants from Russia to the EAEU countries has a positive impact on labour productivity in those economies.

Research Methodological Basis:

1. The indicators under study (see Tables 1 and 2):

– labour migration in the EAEU countries in 2015-2022 (data are based on the Statistical Yearbook of the Eurasian Economic Union, EAEU) [10];

– labour productivity level in the EAEU member states in 2015-2023 (data are given according to World Development Indicators, WB) [11].

2. The object of the research: the EAEU countries, except of Russia, 2015-2023.

3. Research methods: correlation analysis is used to verify the hypothesis (p-value = 5% and 10%).

**Table 1** – Indicators of international migration in the EAEU countries, 2015-2022

| Years | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|
| Armenia | | | | | | | | |
| Migration growth (+), outflow (-) | -25,906 | -24,792 | -23,962 | -18,286 | -15,430 | 3,374 | -4,119 | 6,080 |
| Belarus | | | | | | | | |
| Migration growth (+), outflow (-) | | | | | | | | |
| including: | | | | | | | | |
| the EAEU countries | 4,412 | 1,559 | 574 | 1,247 | 3,690 | … | … | … |
| Kazakhstan | | | | | | | | |
| Migration growth (+), outflow (-) | | | | | | | | |
| including: | | | | | | | | |
| the EAEU countries | -21,479 | -26,253 | -28,158 | -32,746 | -36,451 | -21,318 | -22,983 | -13,053 |
| Kyrgyzstan | | | | | | | | |
| Migration growth (+), outflow (-) | | | | | | | | |
| including: | | | | | | | | |
| the EAEU countries | -4,902 | -4,452 | -4,067 | -5,394 | -5,946 | -5,147 | -1,999 | 3,949 |

*Source: [10]*

**Table 2** – Labour productivity level of the EAEU countries in accordance with World Development Indicators, 2015-2023

| Countries | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| Belarus | 31,494.18 | 31,843.54 | 34,599.31 | 36,811.01 | 38,701.53 | 36,562.95 | 37,622.45 | 42,474.96 | 46,480.43 |
| Kazakhstan | 50,055.64 | 48,741.53 | 49,942.01 | 51,231.39 | 51,851.88 | 51,802.60 | 53,297.28 | 50,857.01 | 53,174.67 |
| Armenia | 65,157.51 | 65,548.53 | 67,840.84 | 70,197.64 | 72,825.90 | 71,403.31 | 73,264.22 | 74,368.80 | 77,189.93 |

| Countries | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| Kyrgyzstan | 13,342.61 | 13,821.12 | 14,671.87 | 14,817.68 | 15,328.66 | 13,967.27 | 14,212.27 | 14,854.61 | 15,438.44 |

*Source: [11]*

**Results**

The results of the correlation analysis are presented in Figures 1-2 and in summary Tables 3 and 4.

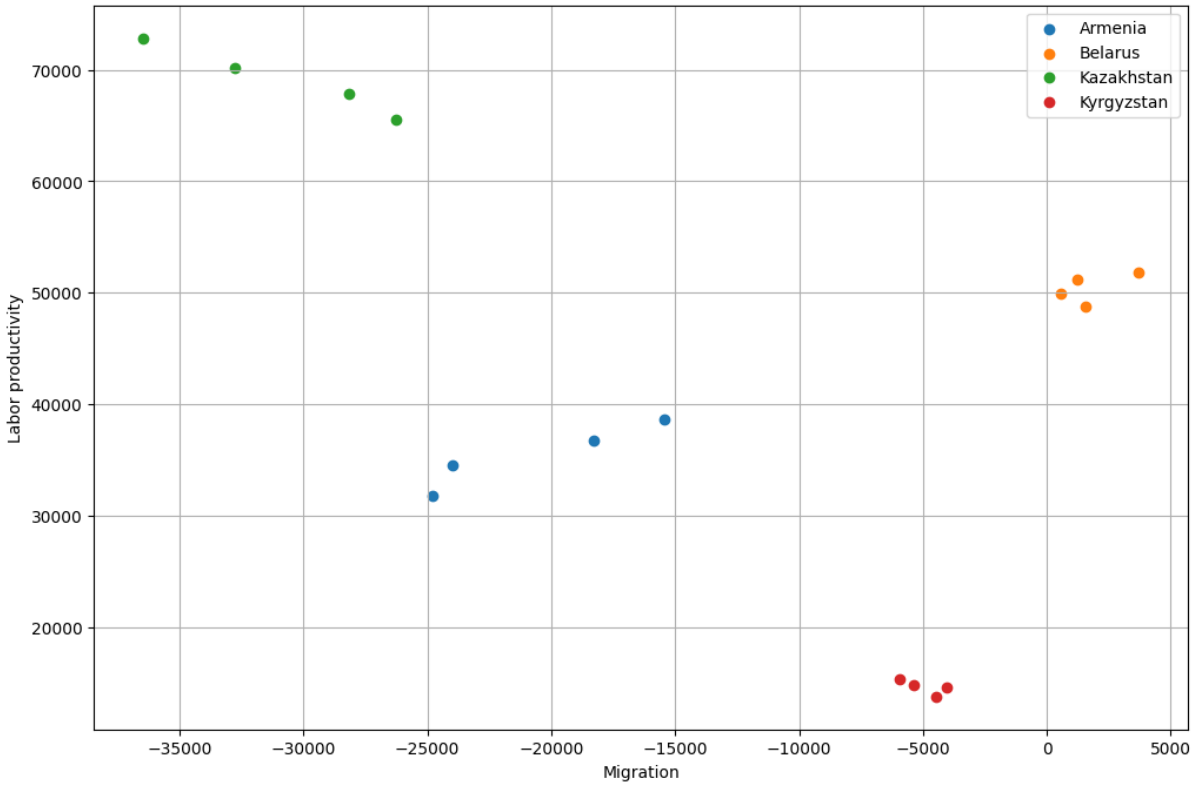


**Figure 1.** Scatter diagram correlation on labour migration and labour productivity level in the EAEU countries

*Source: composed by the authors*

**Table 3** – Correlation analysis results for the EAEU countries with a 1-year lag

| Countries | Correlation Coefficient | P-Value | Power |
|---|---|---|---|
| Armenia | 0.9503053667145075 | 0.04969463328549262 | 0.26683162443646113 |
| Belarus | 0.5814087032673625 | 0.4185912967326375 | 0.13280128451812745 |
| Kazakhstan | -0.990660888762283 | 0.009339111237717024 | 0.2845769277399174 |
| Kyrgyzstan | -0.708271312939343 | 0.291728687060657 | 0.17249001271281394 |

*Source: composed by the authors*

The analysis shows:

– Armenia: very high positive and significant correlation at level 5%;
– Belarus: moderate positive but not significant correlation at the level of 5% and 10%;
– Kazakhstan: very high negative and significant correlation at level 5%;
– Kyrgyzstan: high negative but not significant correlation at the level of 5% and 10%.

Further, we verify our hypothesis considering a time lag of 1 year (the propagation of the reverse spillover effect might be not immediate).

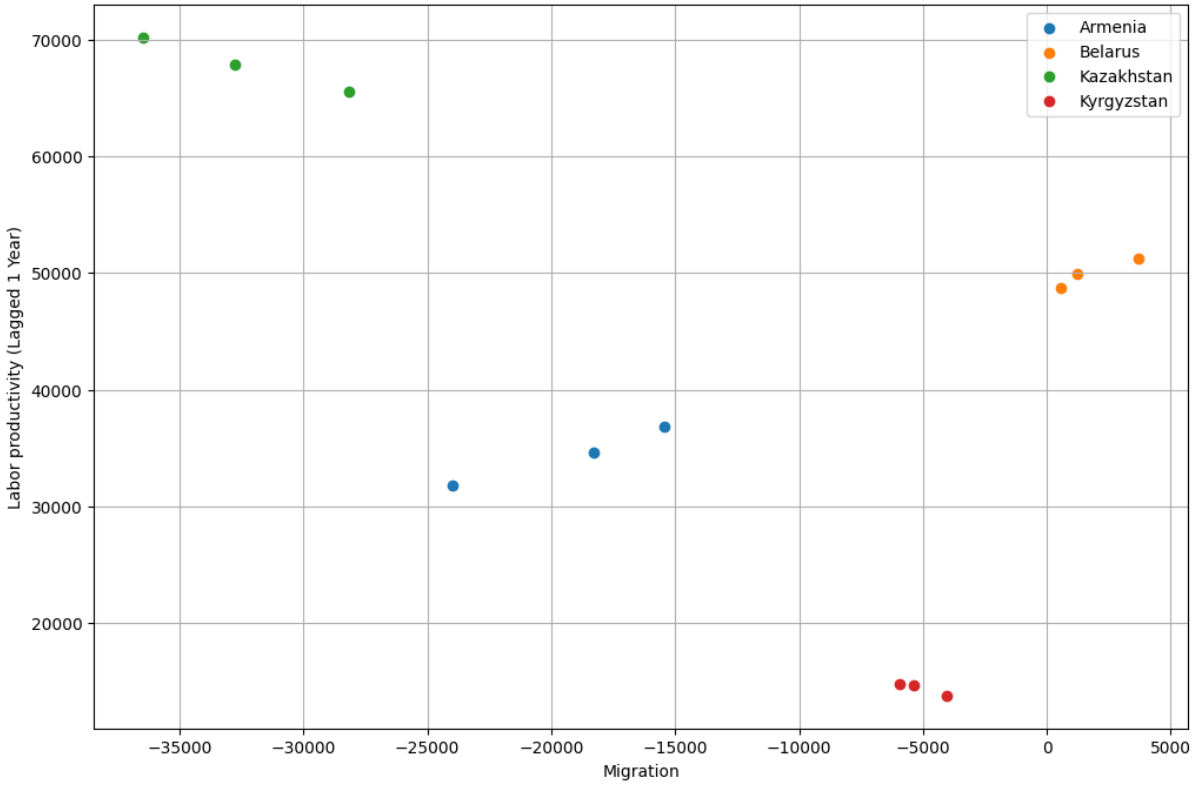


**Figure 2**. Scatter diagram correlation on labour migration and labour productivity level in the EAEU countries with a time lag of 1 year

*Source: composed by the authors*

**Table 4** – Correlation analysis results for the EAEU countries with a 1-year lag

| Countries | Correlation Coefficient | P-Value | Power |
|---|---|---|---|
| Armenia | 0.9921466521290774 | 0.07983754440383034 | 0.17737531049948574 |
| Belarus | 0.9564255806130553 | 0.18862562326301777 | 0.16895843243194975 |
| Kazakhstan | -0.9975924501823511 | 0.044184498761972876 | 0.1786779108486443 |
| Kyrgyzstan | -0.9881724667171587 | 0.09801018165730671 | 0.17642791598478802 |

*Source: composed by the authors*

The analysis shows:

– Armenia: very high positive and significant correlation at the level of 10%;
– Belarus: very high positive but not significant correlation;
– Kazakhstan: very high negative and significant correlation at level 5%;
– Kazakhstan: very high negative and significant correlation at level 5%;

Hence, in Armenia and Belarus there is a positive correlation between labour migration and labour productivity, while in Kazakhstan and Kyrgyzstan there is a negative one.

**Conclusion**

According to analysis conducted, there is a (multidirectional) statistically significant relationship between the variables under study – labour migration has an impact on the level of productivity in the EAEU countries. Moreover, for two countries – Armenia and Belarus – the growth of labour migration has a positive impact on labour productivity, while for Kazakhstan and Kyrgyzstan – on the contrary, the growth of labour migration reduces labour productivity. This phenomenon requires a more detailed research of the qualitative composition of labour migrants from these countries, including their qualifications, gender, age, etc.

Generally, the results obtained may suggest on low qualification of labour migrants from EAEU countries ('transfer of knowledge' may not occur – workers are employed in low-skilled sectors of the economy).

Therefore, diffusion of technological knowledge and, as a consequence, increase in labour productivity may take a longer time (more than 1 year).

Research limitations:

- data biasing the overall picture by the impact of the coronavirus pandemic and subsequent lockdown in 2020 and 2021;
- external shocks significantly affecting the dynamics of socio-economic development of the EAEU countries;
- incorrectly selected indicators (Global Innovation Index) characterising technological development level of the EAEU countries;
- perhaps, correlation analysis was not optimal one for research purpose addressing (the research methodology is being tested for adequate to the research objectives).

However, research results could provide a number of applied researches on interregional labour migration in the EAEU countries.

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**CONFLICT OF INTEREST**

The authors declare that there is no conflict of interest.

**AUTHOR'S CONTRIBUTIONS**

Marina A. Mayorova – correlation analysis; data visualisation;
Denis V. Gerasimov – data collection and processing; literature review;
Marina A. Ugryumova – the concept of the research; writing the original text.

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