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**CALCULATION OF ECONOMIC LOSSES AND GAINS
 CAUSED BY LABOUR FORCE EMIGRATION**

This study addresses the issue of evaluating economic losses and gains caused by labour force emigration. Based on the statistical data on emigration flows, the paper attempts to search for approaches and methods suitable for evaluation of economic losses and gains caused by this emigration. A model calculation of costs covered by the state in the process of preparing its citizens for employment, i.e. education and healthcare is conducted. Indirect losses are also included in this calculation, such as the loss of potential GDP, taxes and social insurance payments.

Keywords: emigration; labour force; GDP; economic losses and gains.

**Сергій Войтович, Емілія Крайнякова, Магдалена Тупа
 ПІДРАХУНОК ЕКОНОМІЧНИХ ВТРАТ ТА ВИГОД
 ВІД ЕМІГРАЦІЇ ТРУДОВОЇ СИЛИ**

У статті зроблено спробу оцінити економічні втрати та вигоди від еміграції трудової сили. Спираючись на статистичні дані щодо потоків еміграції, проведено пошук підходів та методів оцінювання економічних втрат та вигід від еміграції. Представлено авторську модель для таких підрахунків, яка враховує витрати суспільства на підготовку громадян до працевлаштування, включаючи освіту та охорону здоров'я. Непрямі втрати також враховано при підрахунку у вигляді потенційних втрат у ВВП, недоотриманих податків та соціальних виплат.

Ключові слова: еміграція; трудова сила; ВВП; економічні втрати та вигоди.

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**Сергей Войтович, Эмилия Крайнякова, Магдалена Тупа
 ПОДСЧЁТ ЭКОНОМИЧЕСКИХ ПОТЕРЬ И ВЫГОД
 ОТ ЭМИГРАЦИИ ТРУДОВОЙ СИЛЫ**

В статье сделана попытка оценить экономические потери и выгоды от эмиграции трудовой силы. Опираясь на статистические данные о потоках эмиграции, осуществлён поиск подходов и методов для оценки экономических потерь и выгод от эмиграции. Представлена авторская модель для таких подсчётов, которая учитывает затраты общества на подготовку граждан к трудоустройству, включая образование и здравоохранение. Непрямые потери также включены в подсчёт в виде потенциальных потерь в ВВП, недополученных налогов и социальных выплат.

Ключевые слова: эмиграция; трудовая сила; ВВП; экономические потери и выгоды.

Introduction. One of the consequences of Baltic and Central European countries joining the European Union was the liberalization of labour markets in the old member states. As a result, labour force emigration is becoming a frequently discussed economic and social issue. The unemployment rate in these new member countries is often higher and emigration for work sometimes tends to be perceived by the public and mass media as a positive phenomenon – it contributes to gaining new working experience, knowledge and language skills (Adepoju et al., 2010; Kazlauskienė and Rinkevicius, 2006). This is of course based on the assumption that after a few years of

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working abroad and consequent return these workers will use their newly gained experience while working in their home country (Jancikova, 2014).

As mentioned above, labour force emigration is an often discussed phenomenon, be it by mass media or in the expert community. However, these analyses mostly focus on the reasons that led to the act of emigration, the overall intensity of emigration flows and also the scope of emigration to specific Western European regions and countries (Divinsky, 2005; Rosenow, 2009; 2010; Schaeffer, 2010; Kordos, 2014; Simkus, 2014).

Gaining employment abroad is in this specific period seen as a phenomenon beneficial for both countries (Daugeliene, 2007). Also, migration as such is perceived as a proof that free movement of workers broadens the possibilities at European labour market (Habanik and Koiso, 2012; Dagiliene et al., 2014; Haviernikova and Srovnalnikova, 2014). Negative social and economic effects of migration are only discussed with connotations to the so-called "brain drain", i.e. the loss of young and talented workers (Kazlauskiene and Rinkevicius, 2006; Daugeliene, 2007). This effect tends to be the prevalent reason for the rise of concerns about the possible losses for the country when it comes to migration (Divinsky, 2009).

In spite of, or perhaps because of this, expert and scientific community, general public, politicians, state institutions and mass media currently often work with or present information on migration of labour force that is many times mere guesses, assumptions or myths. Currently, only an idea of the overall scope of migratory flows to Western European countries can be made of the fragmented mosaic made up of national statistics, surveys and evaluations conducted in both countries of destination and Slovakia. An exact evaluation of migratory flows of labour force abroad, their scope and intensity in time and space, impact on employment in both home and destination countries, skills and practices acquired abroad and subsequently used at home in terms of gains and losses for economy, society, and emigrants themselves is not available for the time being; thus not part of any measures and policies of Slovak government, local government authorities; as well as scientific and expert publications and research.

Therefore, the main purpose of the present study is twofold. First, it is to identify the basic principles in the evaluation of economic losses and gains caused by labour force emigration. In the study, a model for the evaluation of the balance than the real balance of gains and losses caused by emigration is proposed. To do so, a set of economic criteria is elaborated and mathematical calculations are applied to estimate economic losses and gains caused by emigration for economy and society. Statistical data available in Eurostat, WTO, Statistical Office of the SR, Ministry of Labour, Social Affairs and Family of the SR, World Bank, International Monetary Fund, and research data published in scientific and expert publications are used to perform the calculations. General scientific and research methods are employed in the study, such as induction, deduction, abstraction and comparison, analysis and synthesis of selected facts, phenomena and processes.

Principles applied in the evaluation of losses and gains caused by labour force emigration. The main category and subject matter of the analysis is labour force as one of the important production factors. Under market economy, labour force undergoes regular reproduction processes, such as purchase, sale and employment in manufac-

turing. Labour force refers to the ability of an adult person to regularly and in line with requirements related to manufacturing processes, do mental or physical work. The ability to work encompasses certain inborn and learned human qualities that are being formed and developed in the process of maturing.

In the process of forming and developing work abilities, purposeful education plays an important role; and naturally there are financial costs associated with education. As education of persons is funded mostly by Slovak government, it is expected that educated labour force will contribute to economic growth of the country in the future. When moving abroad for employment purposes after the completion of study (secondary or higher education), the expense related to education of labour force becomes the loss-making item for the state. In addition, loss-making items include expenses paid by the government on healthcare, social security benefits, and social insurance for those in full-time education. In the case of emigration, the lost (not generated) portion of Gross Domestic Product (GDP), unpaid taxes to national and local budgets as well as no payroll transfers to social insurance fund are also loss-making items for economy and society.

The issue of losses and gains caused by emigration is worth mentioning only when migratory flows are extensive in time and intensity (number of emigrants). The calculation of chi-square coefficient (χ^2) shows that with 2,329 employed persons and 242,000 emigrants, the difference of 1% in the indicators is statistically significant.

It is also worth noting that registering and monitoring the number of labour migrants are complex processes. There exists no reliable and regular registration as to migration data in Western EU countries as well as in Slovakia. Therefore, reliable sources of information on emigration appear to be labour force surveys (VZPS) produced by the Statistical Office of the SR. According to the UPSVAR, there were 270,600 Slovak workers employed abroad in 2008 (Statistics, 2014).

During the years of the global economic recession, the number of labour migrants dropped slightly; and has been again on the rise recently. There were approximately 220,000–230,000 Slovak citizens working legally and irregularly abroad before the recession (Divinsky, 2007: 24–28) (Figure 1). A recent study conducted by the Slovak Academy of Sciences says that 242,000 Slovak citizens worked abroad in 2013 (Spravodajstvo, 2014). This, however, appears to be only a rough estimate as the experts say there are more than 60,000 Slovak care workers employed in Austria (Statistics, 2014). That is why, the number of 242,000 Slovak citizens working abroad is a more accurate figure on emigration from Slovakia. The figure of 242,000 Slovak citizens working abroad represents 10% to the overall number of persons employed in the economy of Slovakia and 8.9% to the overall working age population.

The data on level of education of migrant workers is important for the calculation of direct costs spent on workforce reproduction. Following the data produced by the Statistical Office of the SR regarding the educational attainment of Slovak migrant workers, there are 61% of emigrants with completed secondary education, 18% with higher education and only 6% with elementary education (Statistics, 2014).

The calculation of losses and gains caused by emigration will be based on a situation model assuming that almost all migrant workers out of 242,000 were educated in Slovakia and found employment and worked abroad after completion of their studies. Besides indirect costs on labour force reproduction, expenses from the govern-

ment budget on elementary, secondary and higher education are the biggest items. Similarly, the biggest item on the side of economic losses caused by emigration is the lost (not generated) Gross Domestic Product. These are two main items included in the balance of losses and gains caused by labour force emigration. The remaining direct and indirect expenses on workforce reproduction, such as expenses on health-care, expenses paid to kindergartens, or on post-A-level studies are only complementary expenses to overall costs. It is true that economic benefits, such as remittances, domestic consumption, qualifications gained and amount of knowledge accumulated abroad in case of moving back and finding employment home cannot compensate the home country for the losses in GDP caused by emigration. In the following section, a model balance of economic losses and gains caused by emigration is designed.

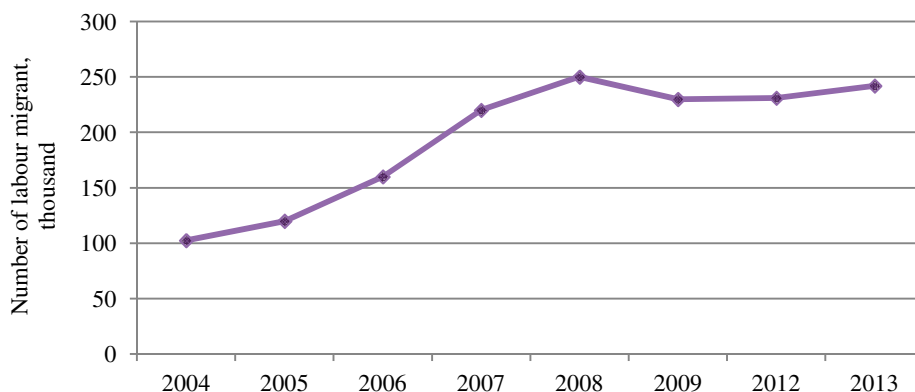


Figure 1. Number of Slovak citizens working in the EU/EEA countries since 1 May, 2004 (UPSVR. Statistical Office of the SR)

Calculation model of economic losses and gains caused by labour force emigration.

In calculations of losses related to education, statistical data on the number of emigrants from Slovakia and their educational level are used. Out of total 242,000 emigrants from Slovakia, 61% are with completed secondary education, 18% with higher education, and only 6% with elementary education. In 2009, the average expenditure per pupil was 4,433 USD in pre-school facilities, 5,099 USD in the first grade of elementary schools, 4,658 USD in the second grade of elementary schools, 4,658 USD in secondary schools and 6,758 USD in institutions of higher education (OECD, 2009). In the following years, expenditure on elementary and secondary education was slightly increasing, whereas the expenditure on higher education was decreasing. Thus, the average expenditure on education in 2013 can be considered to be similar to that of 2009.

When taking into account the years of education, i.e. one year of preschool education, 9 years of elementary education, 4 years of secondary education and 5 years of higher education, the total expenditure per elementary school student amounts to 48,119 USD, per secondary school student 66,758 USD and per student in higher education 10,0548 USD. It follows that these costs in relation to the level of education (number of years of education) of 242,000 emigrants from Slovakia make the total expenditure on education amount to 17,568,200 USD. Thus, when all emigrants

completed their studies and training in Slovakia, and worked abroad during their entire working age, the amount of 17.5 mln USD spent on education and training would represent the direct loss for society and economy. The same would apply to healthcare costs. The healthcare expenditure for 242,000 persons during their education and training would amount to approximately 5 bln EUR according to expenditure made in 2013 (Vseobecna, 2015). It follows that the total costs of education in the amount of 13.4 bln EUR (17.5 bln USD) and costs spent on health care would be the direct economic loss of the state amounting to 18.4 bln EUR.

No confirmed data, however, is available as for the actual duration of stay abroad for work-related reasons. According to the survey conducted by the Institute of Sociology of the Slovak Academy of Sciences, 36% of the respondents in the 18–24 year-old age group and 7% of the respondents in the 55–59 year-old age group expressed their intention to stay abroad permanently, yet their answers cannot be taken as definite decisions (Slovensko, 2006). For the analysis, it would be sufficient to calculate how many years a person should approximately work in Slovakia to generate the amount of gross domestic product comparable to his/her costs of education paid by the government.

In 2013, Slovak gross domestic product at constant prices was 71.13 bln EUR, and 2,329,000 persons worked in Slovak industries. GDP per person employed was 30,541 EUR. It follows that an emigrant with elementary education would generate GDP comparable to his/her education costs (48,000 USD) in one year and a half when employed in Slovakia. Similarly, it would take more than 2 years of employment in Slovakia for an emigrant with secondary education to generate GDP comparable to his/her education costs (66,000 USD), and to generate GDP comparable to additional costs related to his/her training would take approximately 3 years. Finally, an emigrant with higher education should be employed in Slovakia for more than 3 years.

If 242,000 persons working abroad in 2013 were employed in Slovakia, they would generate GDP amounting to 7.4 bln EUR in one year which would represent 10.4% of Slovak GDP in 2013. Direct expenditure on their training amounted to 13.4 bln EUR. Similarly as with per-emigrant calculations, all those who received education and training in Slovakia and left Slovakia for employment-related reasons in 2013, should find and maintain employment in Slovakia for 2 years on average in order to generate GDP comparable to their education and training costs ($7.4 \times 2 = 14.8$ bln EUR, education costs 13.4 bln EUR).

Losses caused by emigration from Slovakia could also include unpaid income tax and excise tax. Based on the average wage amounting to 824 EUR in 2013, 242,000 emigrants should have paid the income tax of 304 mln EUR on average. According to the survey by Sberbank Slovensko, the average spending per capita on food, clothing, utilities etc. amounted to 1,921 EUR in 2013 (Sberbank, 2013). Out of this amount, VAT payments to national budget amounted to 318 EUR. Value added tax paid by 242,000 Slovak citizens working in their home country would make additional 77.1 mln EUR.

Unpaid social and health insurance contributions can also be regarded as losses caused by labour force emigration. Health insurance for 242,000 workers would approximately amount to 95.7 mln EUR and the amount paid by their employers in

Slovakia would amount to 239.3 mln EUR (Vseobecna, 2015). Similarly, the country would not receive social security payments from 242,000 prospective workers totalling to 224.9 mln EUR and 603 mln EUR from their employers in 2013 (Socialna, 2015).

When the direct government expenditure in the amount of 18.4 bln EUR on education and health care for 242,000 emigrants during the years in education and training were added to potential losses caused by unpaid taxes, no payroll transfers to healthcare and social insurance systems in the amount of 21.7 bln EUR, the total losses would total to 40.1 bln EUR. In order to generate GDP comparable to these direct and indirect costs, each Slovak citizen working abroad would have to work in Slovakia at least for 5.5 years after the completion of his/her studies and training.

Economic benefits from labour migration would be, on condition that each person works at least 5.5 years in Slovakia, the skills and practices workers acquire abroad and subsequently use after their return to their home country. It is, however, not viable to calculate exactly economic benefits caused by emigration mainly due to incomplete or missing statistical data.

Short-term economic benefits of emigration are remittances – transfers of goods and funds to individuals in Slovakia by migrant labourers working for at least one year abroad. According to the World Bank estimates, the overall volume of funds transferred by Slovak foreign workers in 2013 was almost 2 bln USD (1.5 bln EUR) (Worldbank, 2015). These remittances, however, accounted only for 2.1% of Slovak GDP and 20.3% of the amount that could have been generated by them during one-year employment in Slovakia in 2013.

Discussion and results. As confirmed by the calculations, the resulting balance from workforce emigration is loss-making for economy and society. Currently, it is not known (except for estimates) how many years labour migrants will live and work abroad. Any period of time of employment before moving abroad or after moving back home is beneficial for the economy of the home country. Equally, every additional year working abroad would be detrimental for both the economy and society if there were job opportunities in Slovakia.

Even balanced economic losses and gains caused by emigration, i.e. when direct and indirect costs spent on education and training equal to the years worked and GDP generated in Slovakia cannot be regarded as a positive phenomenon. It is mainly due to the fact that the exclusion of some portion (volume) of the important factor of production, i.e. labour force from manufacturing processes, not only its economic value in a purely monetary expression is being lost. Much more is being lost – primarily the development potential of economy and society whose essence lies in human labour.

This is mainly to be attributed to the characteristics of labour force. While other factors of production, such as for instance raw materials or energy lose their amount of value under some circumstances, machinery and tools lose their amount of value over time, the value of labour force in the manufacturing process, however, is increasing over time.

Moreover, emigration of labour force reduces the welfare development potential of the society. Labour migrants do not contribute their fair share to government-funded education and health systems, thus widening the gap between those who pay pension contributions to the national pension system and pension beneficiaries. It should

be born in mind that in principle highly skilled and well-educated workforce with language skills ready to live in a different cultural and social environment are leaving Slovakia for work-related reasons. Losses caused by "brain drain", however are irreversible and lead to degradation genetic fund of the nation. Moreover, labour emigration has a detrimental impact on family relations, friends, children's education, cohesion of social associations and groups. In addition, detrimental effects of emigration are apparent in demographic processes, birth rate, population ageing etc.

Emigration in the short run and under certain economic and social circumstances can, however, have advantages for economy and society. This is especially true for social and economic conditions of Slovakia as well as other Central European countries. Despite the fact that 242,000 Slovak citizens (9% of the working age population) worked abroad, 14% of Slovaks were registered as jobless in 2013. It follows that Slovak economic system cannot fully utilize this factor of production. Obviously, some labour force is idle and with no development potential for economy and society.

Under the abovementioned conditions, emigration of labour force brings certain economic benefits for both the economy and society. It is more advantageous for the economy and migrant labourers themselves from economic, social and psychological point of view to work abroad than to sit idly at home. In the case of employment abroad, sustenance problem of workers is removed and state budget is not burdened by unemployment benefits. Additionally, emigrants often increase their qualifications, accumulate a certain amount of knowledge, new skills and practices. In addition, they do not experience negative psychological, social and economic consequences of unemployment.

Conclusions. It is shown here that accurate statistical data on the extent and intensity of migratory flows, motives and intentions for migration, social and demographic characteristics of migrants are not available for constructing properly the model approach to the evaluation and calculation of economic losses and gains caused by labour force emigration. Moreover, evaluation of losses and gains in purely economic terms is insufficient as it is not providing a comprehensive and wider picture of the phenomenon within the system of economic and social processes, and simultaneously not reflecting long-range goals of economic and social development of the country.

Model evaluation of economic losses and gains caused by labour force emigration indicates losses for economy and society. Under certain conditions, however, economic losses can be minimized or replenished. In addition to losses in economic terms, the loss of an adequate part of development potential of the economy and society is considered to have much more damaging effects. Therefore, labour force emigration is an undesirable phenomenon in economy and society, from both economic and social points of view.

Nonetheless, evaluation of merely economic losses and gains does not provide an inclusive view on actual losses and gains for economy and society. Additionally, a purely economic approach distorts the actual understanding of the importance of emigration in terms of social progress and economic development of the society. That is why exhaustive evaluation of losses and gains for economy and society caused by emigration cannot be performed without taking into account social goals of the soci-

ety as well as other related factors, such as psychological, cultural and demographic ones as part of the evaluation.

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