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**Article**

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## ECONOMIC EFFECTS OF MIGRATION FROM POLAND TO THE UK

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### Abstract

Considering that large numbers of the EU-8 immigrants was a strong argument for the Brexit, the objective of this paper is to assess some economic effects of migration from Poland to the UK for both countries. Intensive emigration of the Poles to the UK since 2004 negatively affected Poland's economic growth in the long run, but it also reduced tensions at the labour market by decreasing the unemployment rate. On the other hand, the increase in Polish immigrants in the UK did not significantly affect economic growth and unemployment rate in the destination country in the short run in the period 2004-2015. A significance influence was observed only in the long run, when the UK economic growth decreased, but the pressures on the labour market significantly reduced. From these empirical findings, some policy recommendations are required for both countries: for Poland, migration policies to promote the return of migrants and more efficient utilization of labour force, while for the UK – shaping a more flexible labour market.

**Keywords:** migrants, Brexit, economic growth, unemployment, European Union

**JEL Classification:** C51, C53, J61

### Introduction

The UK experienced rapid growth in immigration, especially after the EU enlargement in 2004, but also a severe decrease in output in the context of the recent financial crisis of 2008. The UK was among the three countries to open its labour market to migrant workers from the recently joint member states (the so-called EU-8) back in 2004. Assuming this policy, net migration to the UK grew by 66% only in one year (from December 2003 to December 2004). Economic growth for the next 15 years in the UK was around 3% a year, because of the world financial crisis that started in 2007. In this context, many Britons tried to explain the weak performance of British economy by the large number of immigrants

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that came in the UK since 2004 and negatively affected economic growth due to higher public expenses required. Poland is the country that sent most migrants in the UK after 2004 as compared to the other countries that entered the EU in the same 2004 (Spigelman, 2015). Therefore, a strong argument for the Brexit was the issue of large numbers of immigrants, especially from the CEE countries, Poland being the leader among them. This popular argument for the Brexit did not find much scientific support, while the recent studies (Simionescu et al., 2017; Wadsworth et al., 2016; Portes, 2016; Petroff, 2016; Wadsworth, 2015; Dustmann and Frattini, 2014) ended up observing positive effects of immigration from the CEE countries for the UK economy.

Most of such studies focused only on economic effects of migration for destination country, but only a few evaluated the impact of emigration on the economy of the origin country (Atoyan et al., 2016; De Luna Gallardo et al., 2016). Even if remittances might have positive effects on consumption and investment in migrants' origin country, the long-run effects showed a slowdown in economic growth and a decrease in economic convergence.

Considering the mentioned issues regarding the economic effects of migration in the Brexit context, the main aim of this paper is to assess the impact of Polish immigrants in the UK on economic growth and unemployment rates in both countries. The hypothesis is that the emigration from Poland to the UK has negative effects on Polish economy and beneficial effects on British economy, even if the Britons claim about the negative consequences of the Poles' factor on public expenses. The empirical analysis takes into account the situation since 2004 when Poland became the EU member state. The methods used in this research (Kendall's coefficients, vector error correction models) provided important economic results: as expected, large-scale emigration of the Poles to the UK negatively affected Poland's economic growth in the long run, but reduced tensions at the labour market by decreasing the unemployment rate. On the other hand, the increase in Polish immigrants' number in the UK did not significantly affect economic growth and unemployment rate in the destination country. A significance influence was observed only in the long run, when the economic growth decreased, but same did the unemployment rate. In this context, after the Brexit the migration policies should encourage migration from Poland, even if the people who voted for the Brexit were initially against this. At the same time, economic policies in Poland should focus on better utilization of the local labour force.

The structure of the paper follows the presentation of theoretical background regarding the determinants of migration from Poland to the UK, but also makes an empirical analysis of the phenomenon in question. After this introduction, the paper continues with the review of scientific literature that explains the reasons of the Poles to come to the UK, but also the economic effects from migration for origin and destination countries. The next section provides empirical evidence on the economic impact of migration from Poland to the UK. The last part of this study concludes.

### **1. Review of scientific literature**

The economic effects on migration of the Poles in the UK can be observed in the destination country, but also in the origin countries. In this context, some macroeconomic variables might be significantly affected in both countries because of the free movement of persons from a country to another. The recent debates on the Brexit brought into focus more than ever the potential negative effects of immigrants on the economy of the host country. One strong argument for the Brexit was related to the negative effects of CEE

migrants on the UK economy (Simionescu et al., 2017). However, this argument, supported especially in media, has not been proved by the empirical analysis of statistical data (as it often proves to be in relation to the media covering hot-debated topics (see e.g. Čábelková et al., 2015)). The Poles are the largest community of immigrants from the UK, most of them arriving after the EU enlargement in 2004. Spigelman (2013) showed that the negative image of the Poles in the British media in the period 2004-2008 was not justified by the reality. Moreover, Esses, Medianu and Lawson (2013) considered that the negative image of immigrants from CEE countries and refugees arrived till dehumanization. The UK press considered these immigrants as economic opportunists when they came in the UK to have a better life and a better job. Strielkowski et al. (2016) show that the migration card was played by the UK media mainly for political reasons but everyone tends to forget that almost 3 million UK citizens currently reside in other EU countries (which is about the same amount as the number of people born in other EU countries living in the UK).

The literature review will follow few directions: the economic reasons for migrating from Poland to the UK, the economic effects of migration in the destination country and the economic consequences for the origin countries. Most of the studies focused on the impact of immigration in the host countries, but few of them analyzed the impact of migration on the origin country (Glazar and Strielkowski, 2010).

In most cases, the economic reasons for migrating are related to wage differentials, differences in GDP per capita, large economic disparities between regions and unemployment differentials, as for example Grenčíková and Španková (2016) noticed. The free movement of persons is one of the freedoms determined by the European Union foundation together with free movement of goods, services and capital. From theoretical point of view, the Single Market existence creates additional employment and earning perspectives for the workers from different countries of the EU. Only three countries from EU-15 (the United Kingdom, Sweden and Ireland) opened immediately their labour market after the enlargement in 2004, when Poland also became a member state of the EU.

EU membership did not imply uncontrolled immigration into the main EU countries. On the contrary, after the EU enlargement from 1980, the net emigration from Portugal, Spain and Greece significantly decreased. Before EU Eastern Enlargement, many studies (Bauer and Zimmermann, 1999; Boeri and Bruecker, 2000; Zimmermann, 2004) tried to assess the possible consequences of the free movement of labour from these states that include mostly post-communist countries with low GDP per capita compared to the average in the EU-15 (Vasile, Androniceanu, 2016). None of these papers proposed a catastrophic scenario. Glazar and Strielkowski (2010) show that the same applies in the case of Turkish migration to the EU – there are about 5 million Turks currently residing in the EU countries and even in the case the borders will be opened to all Turkish citizens seeking to move to one of the EU countries (mostly represented by Germany, Netherlands or Belgium), their numbers are going to be manageable. We cannot speak about a mass migration even in the case of the countries that opened immediately their labour market after 2004 to the workers from EU-8. However, more migrants than expected came in the UK from CEE countries.

One economic reason of the Poles for migrating in the UK is related to the wages that are higher in the destination country compared to Poland, even if illegal migrants are paid less than the minimum official salary in the UK. Other reasons might be related to the language which is the second most spoken language in Poland, especially by young Polish people

that are more eager to emigrate. On the other hand, the Poles already had a big community even before 2004 that attracted more migrants after Poland's integration in the EU.

Salt and Okólski (2014) showed that a climate of enthusiasm in favour of the movement of the Poles to Western Europe contributed to the big migration in the UK. The studies that employed regression analysis showed that the decision of the Poles to emigrate in the UK are related to economic issues like low wages in Poland, high unemployment rate and a slow economic growth (Drinkwater et al., 2006; Pollard et al., 2008). The surveys of Polish immigrants from the UK indicated that the reasons of migration are related to financial issues, lack of any opportunities in Poland and high aspirations for professional and private development (Cizkowicz et al., 2007). The Poland's entrance in the EU coincided with the entrance of increasing number of the Poles on the national labour market, because of the baby boom in the period 1979-1984. Moreover, UK labour market, around two times larger than the Polish one, opened in 2004. Even if some Polish migrants were high skilled, they preferred making unqualified work for more money than in Poland (Milaszewicz et al., 2015).

From theoretical point of view, the long-run effects of migration consist in a higher variety of production in the destination countries and in remittances for origin states of migrants (Giovanni, Levchenko and Ortega, 2015). The neoclassical models for economic growth consider that migration might reduce the total output in origin country, but it could increase the output per capita in destination state, accelerating the economic convergence (Androniceanu, 2017).

The empirical studies showed a positive impact of migration for host countries, while the findings for origin countries are still contradictory. East-West migration mostly of high skilled migrants brought many benefits for EU-15 countries. Jaumotte and Buitron (2015) showed that the destination countries' long-run benefits increase labour productivity and output because of the received migrants. Using a sample of 18 states from OECD, the authors showed that each increase in the weight of adult immigrants by one percentage point generate an increase in the GDP per capita by 2 percentage points.

The economic literature that focused on the effects of migration on economic growth and convergence showed long-run positive effect of net migration on GDP per capita in the origin country (Ozgen, Nijkamp and Poot, 2009). However, in the origin countries emigration had a negative impact on economic growth and decreased the convergence in output per capita. Atoyan et al. (2016) showed that in CESEE countries the real DP rate in 2012 would be by 7 percentage points higher in the absence of emigration from the period 1995-2012. Moreover, emigration might have a negative effect on the current account balance of the former communist countries (Aristovnik, 2007; Aritovsvnik, 2008).

In the Brexit context, many recent studies brought arguments based on empirical findings to show the benefits of EU immigrants for the UK economy. Some papers (Wadsworth, 2015; Portes, 2016; Dustmann et al., 2005) analysed the effects of immigration on the wages and jobs of UK nationals. The empirical findings showed in all cases that the increase in the number of immigrants did not significantly affect the wages and the jobs of the British people. Moreover, Wadsworth et al. (2016) showed that the regions with high increases in the number of EU immigrants did not have greater fall in the jobs and salaries of the UK-born people. The real cause of the fall in wages after 2008 is the recent global financial crisis and the issues related to the need of a rapid economic recovery. Moreover, Britons did not have less jobs and lower salaries in low skilled fields because of the EU high-skilled immigrants.

The immigrants come with additional resources that could be used for growing the expenditure on local health and education for the UK-born people. Some studies proved the existence of significant positive effects of the more educated immigrants on the labour productivity in the UK (Ortega and Peri, 2014; Ottaviano et al., 2016, for UK service productivity). For entire immigration, the most empirical studies identified positive or even insignificant influence of immigration on labour productivity. In this context, Felbermayr et al (2010) showed that at each increase by 10% in the immigrant stock, the income per capita increases, in average, by 2.2%. The EU immigrants contributed to the decrease of the budget deficit, because they paid more taxes compared to the money allocated for welfare and for public services used. The immigrants did not have a negative impact on the public expenses on education and health or social housing.

Considering the effect of immigrants on public finances, Dustmann and Frattini (2014) brought evidence that EU immigrants had a positive fiscal contribution, because they paid more taxes than welfare benefits. On the other hand, the Britons received more benefits than the paid taxes. Springford (2013) considered that the principal cause of the migration from CEE countries to the UK is represented by the welfare gap. Only 0.8% of the EU immigrants received unemployment benefits one year after their arrival in the UK. The most immigrants come to the UK only to find a job and not for high income. 71% of immigrants from the UK have jobs and only 6% of them are unemployed, but without asking for allowance support (Petroff, 2016).

Many Britons consider that immigration might have a significant impact on house prices. In the UK, the housing supply is low even without EU immigrants. The real cause is the weak planning system that do not permit for suitable infrastructure decisions (Hilber, 2015). In this context, Sa (2015) found no empirical evidence that immigration had a positive impact on house pricing. There is a high uncertainty regarding the future migration policies of the UK after the Brexit. The people who promoted the Brexit hoped that the EU migration will be controlled, but in case of trade agreements with the EU free labour movement will exist for the EU citizens like in Switzerland and Norway. The UK should take into account policies that focus more on the labour market flexibility.

For the origin country, emigration could bring positive effects on labour market by decreasing the unemployment rate and reducing the labour market tensions. These benefits translate into less expenses for social protection. However, in the long run this advantage might become a negative effect, according to Silasi and Simina (2008) who showed the deficit of human capital that might determine the import of labour force from other countries. Another positive effect is related to remittances that finances the state budget. The money sent by migrants in the origin country might improve the life quality of their family from home, could increase the consumption and the building industry. The remittances that are economies of migrants might be an importance source of investment in the origin country. In this context, the investment might generate economic growth and a better life, which make the remittances a factor of sustainable development. The temporary migration might improve the quality of human capital that in the origin country might contribute to the increase of labour productivity. If the migrants do not come back home, the state loose the money that was invested for emigrants' education.

Léon-Ledesma and Piracha (2004) showed positive effects of migration for CEE countries through the remittances that stimulated investment. On the other hand, other studies showed losses in the output of recent member states of the EU (Dustmann, Fadlon and Weiss, 2011; Barell et al., 2007).

Emigration might damage the competitiveness in the origin countries by more channels. The reduction of labour resources could generate a growing pressure on internal salaries (Simionescu et al., 2016) and the loss of qualified labour force might diminish the productivity under human capital externalities and a lower substitution between high skilled and low skilled labour force. The high remittances might increase the level of minimum income and might reduce the labour supply (Chami et al., 2008; Barajas et al., 2012), which negatively affects the trade (Acosta et al., 2009; Amuedo-Dorantes and Pozo, 2004). According to Estevão and Tsounta (2011), more remittances are associated with a lower probability of integration on labour market. In CEE-5 countries, an increase in the weight of remittances in GDP by one percentage points generated an increase in the rate of inactivity by 3 percentage points.

According to Atoyán et al. (2016), some policies should be implemented in the origin countries to reduce the negative effects of emigration in terms of economic growth and economic convergence:

- Better institutions and economic policies to promote the migrants' return, less emigration and the attraction of high skilled labour force from other countries;
- A better labour force utilisation by increasing the productivity;
- A better use of remittance mostly for investment and less for consumption;
- Attenuation of adverse fiscal effects of emigration.

## 2. Methodology

In this study, the relationship between the number of immigrants and other macroeconomic variables (unemployment rate, GDP rate) will be assessed considering vector error correction models. If the time series of two variables  $X_t$  and  $Y_t$  are co-integrated, then an Error Correction Model representation exists. Co-integration represents a necessary condition for Error Correction Model and vice versa. If the time series of two variables  $X_t$  and  $Y_t$  are integrated of the same order (they have the same number of unit roots), they are co-integrated if there is a linear combination of them that is stationary (no unit roots).

Engle and Granger (1987) proposed a procedure for checking for co-integration:

- The following regression model is estimated starting from the data in level:

$$Y_t = a + bX_t + Z_t, \text{ where } X_t, Y_t \rightarrow I(1) \quad (1)$$

$X_t$ - explanatory variable

$Y_t$ - dependent variable

a,b- parameters

$Z_t$ - error term

- The Augmented Dickey-Fuller test is performed on residuals (estimated errors  $\widehat{Z}_t$ )

$$\Delta \widehat{Z}_t = \varphi \widehat{Z}_{t-1} + \sum_{i=1}^p \tau_i \widehat{Z}_{t-i} + e_t \quad (2)$$

- Considering the previous regression model, we have to test if  $\varphi$  is 0 or not from statistical point of view.

• In the end, the final decision is taken. If the residuals are integrated of order 0 (stationary), then the  $X_t$  and  $Y_t$  are co-integrated.

However, in this research, we will use Johansen co-integration test of Johansen and Juselius (1990) that has two major advantages compared to Engle-Granger procedure:

- Checking for the number of co-integrating vectors
- Joint procedure: it allows for testing and providing a maximum likelihood estimation of the VECM and long term equilibrium relationships.

In the case a bivariate vector-autoregressive model (VAR), if  $X_t$  and  $Y_t$  are co-integrated of order 1, then:

$$\Delta X_t = c_1 + \rho_1 Z_{t-1} + \beta_1 \Delta X_{t-1} + \dots + \alpha_1 \Delta Y_{t-1} + \dots + \varepsilon_{xt} \quad (3)$$

$$\Delta Y_t = c_2 + \rho_2 Z_{t-1} + \gamma_1 \Delta X_{t-1} + \dots + \delta_1 \Delta Y_{t-1} + \dots + \varepsilon_{yt} \quad (4)$$

$(\varepsilon_{xt}, \varepsilon_{yt})'$  - bivariate white noise,  $Z_t = X_t - AY_t \rightarrow I(0)$  and at least one  $\rho_i \neq 0$

If  $X_t$  and  $Y_t$  are not co-integrated, then  $Z_t$  is integrated of order 1.

Several steps are followed when a vector error correction model is estimated:

- Check if the time series  $X_t$  and  $Y_t$  are integrated of the same order, applying an unit root test for each data series (for example, Augmented Dickey-Fuller (ADF) test);
- Check if the time series  $X_t$  and  $Y_t$  are co-integrated. The co-integration relation is identified. We check if the residuals of the regression model between  $Y$  and  $X$  are stationary.

- Short-run dynamics:

$$\Delta X_t = c_1 + \rho_1 (Y_{t-1} - \hat{\alpha} X_{t-1}) + \beta_{x1} \Delta X_{t-1} + \dots + \beta_{y1} \Delta Y_{t-1} + \dots + \varepsilon_{xt} \quad (5)$$

$$\Delta X_t = c_2 + \rho_2 (Y_{t-1} - \hat{\alpha} X_{t-1}) + \gamma_{x1} \Delta X_{t-1} + \dots + \gamma_{y1} \Delta Y_{t-1} + \dots + \varepsilon_{yt} \quad (6)$$

The main advantage of VECM is that it allows for interpretations of long-run and short-run relationships between variables in the model.

### 3. The effects of migration on the economic growth and unemployment in the UK and Poland

This empirical research is focused on more directions:

- The evaluation of the impact of Polish immigrants on the real economic growth and unemployment rate in the UK;
- The evaluation of the impact of Polish migrants from UK on the real economic growth and unemployment rate of Poland;
- The assessment of the effects of EU and non-EU migrants on the real economic growth and unemployment rate in the UK;



- The assessment of the effects of Polish emigrants on the real economic growth and unemployment rate in Poland.

The data for the number of migrants, real GDP rate and unemployment rate for the UK and Polish are provided by Eurostat and World Bank for different periods. We will analyze the data in the period 2004-2015. The data series for the number of Poles in the UK is presented in Table no. 1.

**Table no. 1: The number of Polish migrants in the UK in the period 2004-2015**

Year	Number of Polish migrants in the UK (thousand people)
2004	69
2005	137
2006	249
2007	399
2008	502
2009	538
2010	564
2011	654
2012	713
2013	736
2014	790
2015	831

Source: World Bank, 2016

As the number of observations is low, the non-parametric coefficients of correlation will be computed. The correlations between migrants and real GDP rate, respectively unemployment rate are computed using Kendall's tau rank correlation. This indicator shows the strength of the relationship between variables, under the assumption that the data series do not follow a normal distribution. The time series for assessing the impact of Polish immigrants on the real economic growth and unemployment rate in the UK, respectively the impact of Polish migrants from UK on the real economic growth and unemployment rate of Poland refer to period 2004-2015. The time series started with 2004, the year when Poland entered the EU and the impact on the UK economy can be observed in Table no. 2.

**Table no. 2: The impact of Polish migrants from UK on the real economic growth and unemployment rate in the UK and in Poland (2004-2015)**

Indicator	Polish immigrants from UK and:			
	real GDP rate in UK	unemployment rate in UK	real GDP rate in Poland	unemployment rate in Poland
Kendall's tau rank coefficient	-0.09232	0.43082	-0.36364	-0.35116
2-sided p-value	0.73048	0.062853	0.114757	0.130494

According to the values of Kendall's tau rank coefficient, there was not a significant correlation between the Polish immigrants from UK and the real economic growth and unemployment rate in the host and origin country. So, it is not justified the Brexit argument

that Polish migrants increased the unemployment rate in the UK or slow down the economic growth.

In Table no. 3, the latest migration statistics are presented. The values of the indicators show that there are more British citizens that leave their origin country compared to the number of migrants that live in the UK.

**Table no. 3: The net migration in the UK in the period 1991-2015**

Year	EU migrants in the UK (thousand people)	Non-EU migrants in the UK (thousand people)
1991	53	167
1992	44	131
1993	44	135
1994	50	156
1995	61	167
1996	72	152
1997	71	166
1998	82	206
1999	66	272
2000	63	316
2001	58	313
2002	61	357
2003	66	344
2004	130	370
2005	152	317
2006	170	343
2007	195	305
2008	198	307
2009	167	303
2010	176	322
2011	174	314
2012	158	260
2013	201	248
2014	264	287
2015	269	279

Source: Office for National Statistics in the UK, 2017

At the end of September 2016, the net migration in the UK was 273,000 people, according to official statistics of the Office for National Statistics of the UK.

According to the values of Kendall's tau rank coefficient in Table no. 4, only the non-EU immigrants from the UK had a negative and significant impact on the real economic growth of the UK. So, it is not justified the Brexit assumption that the EU migrants had a negative effect on UK economy.

**Table no. 4: The impact of EU and non-EU immigrants from UK on the real economic growth and unemployment rate in the UK (1991-2015)**

Indicator	EU immigrants in the UK		non-EU immigrants in the UK	
	real GDP rate in the UK	unemployment rate in the UK	real GDP rate in the UK	unemployment rate in the UK
Kendall's tau rank coefficient	-0.18122	-0.23351	-0.61722	0.051116
2-sided p-value	0.221837	0.111379	2.06E+09	0.742357

According to the values of Kendall's tau rank coefficient in Table no. 5, the number of Polish emigrants had a negative impact on unemployment rate in Poland. As the number of Polish emigrants increased, the unemployment rate in Poland decreased, at 5% level of significance. However, the correlation between variables is not so high.

**Table no. 5: The impact of Polish emigrants on the real economic growth and unemployment rate in Poland (1991-2015)**

Indicator	real GDP rate in Poland	unemployment rate in Poland
Kendall's tau rank coefficient	-0.10949	-0.32727
2-sided p-value	0.471302	0.027178

Based on the significant correlations detected by Kendall's coefficients, two vector error correction models were proposed.

Real GDP rate in the UK and number of immigrants are co-integrated of order 1. A vector error correction model of order 1 was estimated to analyze the relationship between economic growth in the UK and the number of non-EU immigrants. The selected optimal lag was 1.

$$D(RGDP\_UK) = C(1)*(RGDP\_UK(-1) + 0.005932698265*IMMIGRANTS(-1) - 3.705915875) + C(2)*D(RGDP\_UK(-1)) + C(3)*D(IMMIGRANTS(-1)) + C(4)$$

$$D(IMMIGRANTS) = C(5)*(RGDP\_UK(-1) + 0.005932698265*IMMIGRANTS(-1) - 3.705915875) + C(6)*D(RGDP\_UK(-1)) + C(7)*D(IMMIGRANTS(-1)) + C(8)$$

$$D(RGDP\_UK) = - 0.7650084239*(RGDP\_UK(-1) + 0.005932698265*IMMIGRANTS(-1) - 3.705915875) + 0.1348714227*D(RGDP\_UK(-1)) + 0.01210483213*D(IMMIGRANTS(-1)) - 0.009523470908$$

$$D(IMMIGRANTS) = - 0.3535348332*(RGDP\_UK(-1) + 0.005932698265*IMMIGRANTS(-1) - 3.705915875) + 1.376241303*D(RGDP\_UK(-1)) + 0.01089240968*D(IMMIGRANTS(-1)) + 6.126639016$$

C(1) and C(5) have negative values which suggests that there is a long-run causality from non-EU immigrants to UK real GDP rate and from real GDP rate in the UK to the number of immigrants outside the EU in the period 1991-2015. On the other hand, according to Wald test, C(3) and C(6) did not significantly differ from 0 (chi-square=1.29933 and

probability=0.522221). Therefore, there was not a short-run causality between non-EU immigrants and UK real GDP rate. All in all, the increase in the number of immigrants from non-EU countries in the UK generated a decrease in the economic growth of the host country in the period 1991-2015. However, the overall decrease in the economic growth is also due to recent global financial crisis as Wadsworth et al. (2016) already showed.

Unemployment rate in Poland (U\_PL) and number of emigrants are co-integrated of order 1. A vector error correction model of order 1 was estimated to analyze the relationship between unemployment rate in Poland and the number of Polish emigrants. The selected optimal lag was 1.

$$D(\text{EMIGRANTS}) = C(1) * (\text{EMIGRANTS}(-1) + 41710.80735 * \text{U\_PL}(-1) - 659218.6519) + C(2) * D(\text{EMIGRANTS}(-1)) + C(3) * D(\text{U\_PL}(-1)) + C(4)$$

$$D(\text{U\_PL}) = C(5) * (\text{EMIGRANTS}(-1) + 41710.80735 * \text{U\_PL}(-1) - 659218.6519) + C(6) * D(\text{EMIGRANTS}(-1)) + C(7) * D(\text{U\_PL}(-1)) + C(8)$$

$$D(\text{EMIGRANTS}) = - 0.004351066255 * (\text{EMIGRANTS}(-1) + 41710.80735 * \text{U\_PL}(-1) - 659218.6519) - 0.1248551756 * D(\text{EMIGRANTS}(-1)) + 1430.511 * D(\text{U\_PL}(-1)) + 3673.504631$$

$$D(\text{U\_PL}) = - 6.36730176e-06 * (\text{EMIGRANTS}(-1) + 41710.80735 * \text{U\_PL}(-1) - 659218.6519) + 1.751691636e-05 * D(\text{EMIGRANTS}(-1)) + 0.9378888689 * D(\text{U\_PL}(-1)) - 0.5358994955$$

C(1) and C(5) have negative values which suggests that there is a long-run causality from Poland's emigrants to Poland unemployment rate and from unemployment rate in Poland to the number of emigrants in the period 1991-2015. On the other hand, according to Wald test, C(3) and C(6) did not significantly differ from 0 (chi-square=0.898082 and probability=0.638240). Therefore, there was not a short-run causality between Polish emigrants and unemployment rate. All in all, the increase in the number of emigrants from Poland generated a decrease in the unemployment rate in this country in the period 1991-2015. Another important issue is the qualitative interface of the phenomenon. There are many high-educated or qualified people among young people that left Poland and their impact on the Polish economy is higher than the impact of non-qualified migrants.

### Conclusions

Considering the recent debates, even if the UK voted for the Brexit, we assess the economic impact of the Polish migrants from the UK on the economies of both countries. In the media, the Poles are often presented in a negative light, but most of them came in the UK for a job and for a better life, without negatively affecting the perspectives on labour market of the UK-born people. In this study, we showed that in the long run the presence of the Poles since 2004 reduced the tensions on the UK labour market by decreasing the unemployment rate. The loss of human capital that emigrated in the UK had a negative impact on the economic growth in Poland in the period 2004-2015, even if the unemployment rate reduced. The Poland's migration policies should promote the return of migrants and an efficient utilization of labour force. This study is limited to the Polish migrants, but in a future study more migrants from EU-13 countries should be considered. Moreover, this empirical analysis focused only on the impact of migrants on the economic growth and unemployment rate. Another future direction of research should consider the

impact of Polish migrants on the public expenses in the UK and the impact of their remittances on the real GDP of Poland.

After the Brexit, a policy of limiting the immigration would lower the economic growth trend, even if per capita GDP might not be affected to the same magnitude. The UK policy options after the Brexit might be various. The Norway or Switzerland models will encourage free movement, but bilateral agreements with few countries will negatively affect the economic performance of the UK. If the UK will not implement policies for a lower reduction in immigration, the productivity and the labour market flexibility will cause problems to the UK economy that might face more frequent recessions.

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