

THE IMPACT OF POPULATION IMMIGRATION ON THE LABOUR MARKET OF THE UNITED KINGDOM

Gindra Kasnauskienė*, Loreta Vėbraitė

Vilnius University, Lithuania

Abstract. *The impact of immigration on the labour market has become a very important subject of public and political debates in recent years. The aim of this study was to estimate the impact of immigration on the labour market of the United Kingdom in 1991–2010. Using a system of equations for immigration, unemployment, wage and gross domestic product, the structural vector error correction model and linear regression models were developed. The application of the structural vector error correction model has shown that immigration has a negative impact on the country's labour market in the short run as it reduces real wages and increases unemployment. The linear regression models have indicated that immigration, ceteris paribus, negatively influences unemployment and real wages in the long run.*

Key words: *immigration, labour market, impact, short run, long run*

Introduction

The free movement of persons is a fundamental right guaranteed to European Union citizens by the Treaties. This freedom is one of the four freedoms that form the basis of the single market. In addition, one of the features of the evolution of modern society is a significantly increased people migratory mobility.

Labour migration creates both positive and negative effects for each country's economy, demographic situation, education system, culture. Because of economic and political conditions, workforce is migrating from a country where labour supply exceeds labour demand to the country where labour shortage is present. This movement of labour influences the economic efficiency of the host country.

In the last ten years, the growth of immigration brings a number of questions about the impact of this phenomenon on the United Kingdom. The country's society and politicians constantly debate about the impact of immigration on the country's labour market, particularly on wages and employment. The discussion has notably expanded since the arrival of large numbers of migrants from Central and Eastern Europe after 2004.

* *Corresponding author.*

Faculty of Economics, Department of Quantitative Methods and Modelling,
Vilnius University, Sauletekio Ave. 9, LT-10222 Vilnius, Lithuania;
e-mail: gindra.kasnauskienė@ef.vu.lt

For example, one market research firm's (Ipsos MORI) survey on the topic 'the most important issues facing Britain today' showed that in 2008, 42% of respondents said that immigrants or immigration were one of the four most important issues, versus only 6% who did so in 1998 and 27% in 2003 (MORI, 2008). A survey of public opinion in a number of European countries, conducted by the German Marshall Fund, published in November 2008, has revealed that 52% of respondents in the United Kingdom agree that immigrants take jobs away from native-born workers (average across Europe – 34%) (German Marshall Fund of the United States, 2008).

It is important to note that the United Kingdom was the EU country with the highest immigration inflows in 2009 and 2010. In addition, the immigration problem in the United Kingdom will remain relevant in future, because the European Commission and the Economic Policy Committee have estimated that the United Kingdom will be the EU's most populous nation in 2060 (the highest percentage of population as compared to the total population of the EU – 15.2%) and overtake Germany. Also, the population of the UK is expected to grow by 25.1% to 76.7 million over 2008–2060, because of the positive natural change of 7.7 million and an influx of 7.7 million migrants. (European Commission and Economic Policy Committee, 2009).

Thus, the aim of the present research was to study the impact of immigration on the labour market of the United Kingdom between 1991 and 2010 through an econometric analysis based on the structural vector error correction model and linear regression models, with a long-term and short-term distinction.

Literature review

There is extensive literature on the impact of immigration on economies and especially on labour markets. This section presents a review which estimates such an impact in the United Kingdom and other countries. It is important to emphasize that "the most important lesson is that the economic impact of immigration varies by time and place and can be beneficial or harmful" (Borjas, 1994).

Taylor (1995) in his research estimated the impact of labour immigrants on Argentina's economy. He used the ordinary least squares (OLS) method to find the impact of immigrants on labour force and gross domestic product (GDP). Using the general equilibrium analysis, the author found that immigrants increased labour force by 43% and the country's GDP by 19%. In addition, the study has shown that immigrants increase the labour supply in the host country's labour market.

In the research by Islam (2003), a vector autoregressive model (VAR) was developed to analyse the impact of immigrants on Canada's labour market. The study used such variables as immigration, unemployment, real wages, and GDP. The author has found immigrants to create employment in the labour market by increasing the demand

for output, because an increase in the demand for output may increase the demand for labour. As a result, immigrants increase employment opportunities for natives in the labour market. The study has shown that a 10% increase in immigrants will lead to a 1.6% decrease in native wages. Old immigrants were found to have a lesser influence than new immigrants on native wages. New immigrants are usually less skilled and compete with low-skilled native workers while older immigrants would have invested in education and training and improved their skills.

Another study was conducted by Hatton and Tani (2005) who analysed the impact of immigration on 11 regions of the United Kingdom, using panel regression on time series data from 1982 to 2000. Using a simple perfectly competitive model of labour supply and demand, the impact of immigration on unemployment and wages was studied. According to this study, an increase of 100 in net migration to a region from abroad generates a net labour migration from a region to other regions of about 35. Thus, international immigration encourages internal labour movements in the host country: natives emigrate from migrants concentration zones to other areas of the country and thus equalize labour market conditions across the country.

Glitz (2006) used a linear regression model (OLS method) to estimate the impact of labour immigration on the labour market of Germany. Independent variables in the regression were wages, population, and employment of natives in the host country. This model was based on 112 German labour market regions and included time series data for the period 1996–2001. The study showed a displacement effect of 4 unemployed native workers for every 10 immigrants who found a job. This means that of every ten immigrants who found a job, four fill the positions that were intended for native workers, and the remaining six immigrants fill new positions. Thus, immigrants displace native workers in the labour market and increase the unemployment of natives. The study also found a negative impact of immigration on the host country's wages: a 10% increase in skill share leads to a 0.49–0.58% decrease in relative wages.

Lemos and Portes (2008) in their study estimated the impact of immigration from the new EU member states (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia) on native workers of the United Kingdom. The authors used a modified model based on the standard neoclassical theory. This study found no statistically significant impact of immigration from the new EU member states on claimant unemployment, either overall or for any identifiable subgroup. The authors of the research found no adverse impacts on the young or low-skilled workers. The study has found no statistically significant impact on wages, either average or at any point in the wage distribution. Thus, this study has rebutted previous research findings about the impact of immigration from 8 new EU member states on the country's labour market.

Sibanda (2008) in his study evaluated the impact of migrants on the South Africa's labour market in 1980–2006 by measuring their displacement effect (unemployment) and

their effect on welfare of workers (real wages). The study employed two models – those of unemployment and wage. First of all, the model's variables were tested for stationarity; a cointegration test was done, and an error correction model was developed. The results of this study have shown that immigrants do influence the South Africa's labour market. They increase unemployment because of the displacement of natives in the local labour market (a 1% increase in migrants' numbers increases unemployment by 0.1%). However, in this case, the impact of immigration on the country's wages was positive: a 1% increase in migrant labour increases wages by 0.01% in period two. This result can be explained by the Keynesian theory which argues that the labour market will not always adjust to equilibrium whenever there are distortions (wages may not fall due to an increase in labour supply). Furthermore, immigrants can increase the native workers' wages by promoting the host country's productivity growth.

One more study about the impact of immigration on the host country's labour market was done by Fromentin (2012). This study analysed the relationship between immigration, the labour market and economic development in France based on data from 1970 to 2008. In this research, an econometric analysis based on the Johansen cointegration tests and the vector error correction model (VECM) was done. In the VECM, four variables were used: the net migration rate per 1000 inhabitants, Gross Domestic Product by the inhabitant indicator, unemployment rate, and the real hourly compensation in manufacturing, which was deflated by the consumer price index. Fromentin has found a negative relationship between the net inflow of immigrants and unemployment in both the short and the long term. Immigration reduces unemployment in the short run because immigrants integrate rapidly into the labour market by taking available jobs or the jobs that are neglected by native workers. Immigration reduces unemployment in the long term because immigrants create more jobs than they fill owing to the growth of demand. The study also has shown that immigration has a positive impact on the real wages, which means that immigrant workers are likely to be complements with native workers.

One of the most recent studies to analyse the impact of immigration on the labour market of the United Kingdom was done by the Migration Advisory Committee (MAC) (2012). This research analyses the associations between migration and native employment rates in the United Kingdom over the period 1975–2010. The study shows that, in general, there is no relationship between immigration and employment of the United Kingdom born people. In order to assess the impact of immigration, the MAC classified immigrants into two groups – immigrants from the EU member states and immigrants from non-EU countries. The period under analysis was divided into two parts – 1975–1994 and 1995–2010. The MAC results indicated that an increase of 100 working-age migrants from non-EU countries was associated with a reduction of 23 natives in employment for the period 1995–2010. However, inflows of working-age EU migrants had no statistically significant association with native employment over this period. The MAC has also found that an

inflow of 100 foreign-born working-age migrants was associated with a reduction in native employment by approximately 30 in the same year when the output gap was zero or negative (slow economic growth or economic downturn). In addition, the association seemed to be statistically insignificant when the output gap was positive (economic boom).

Assessment of the impact of immigration on the labour market of the United Kingdom

Data analysis and model specification

Economic theory provides no definite conclusions for predicting the effects of immigration on the labour market of the host country. To define these effects on the labour market (wages and unemployment) of the United Kingdom in 1991–2010, an analytical model was developed.

First of all, based on the theoretical findings, appropriate variables were chosen. Later, these variables were tested for stationarity, and the Johansen cointegration test was done, followed by developing the structural vector error correction model (SVEC). Finally, the long-term equilibrium equations were modelled.

One of the model variables is immigration to the United Kingdom (thousands of people). In order to take economic development into account, the United Kingdom's gross domestic product (thousands of pounds) was resorted to in the model. Another variable of the model is unemployment rate, i.e. the percentage of unemployed people in the working-age population. The last model variable reflecting the welfare of workers in the host country is wages. In this study, wages are expressed as the index of real hourly earnings in manufacturing. It is exactly the same variable that Fromentin (2012) used in his study. It should be noted that all variables of the model are in the annual terms for the period 1991–2010.

Before carrying out the empirical analysis, a brief descriptive analysis was conducted to gain a preview of the data used (Fig. 1).

Figure 1 reflects the relationship between immigration and the unemployment rate in the United Kingdom. This graph demonstrates the existence of an inverse relationship between the extent of immigration and the level of unemployment between 1991 and 2011 (with some exceptions). Generally, immigration to the United Kingdom is a volatile process. At the beginning of the period under review, immigration increased due to the fall of the Iron Curtain, wars and ethnic conflicts that led people to seek asylum and to search for opportunities of a better life. Because of the abolishment of the Primary Purpose rule in 1997, immigration the United Kingdom increased (Fiddick, 1999). The Primary Purpose rule required foreign nationals married to British citizens to prove that the primary purpose of their marriage was not the British residency. Therefore, the abolition of this rule made

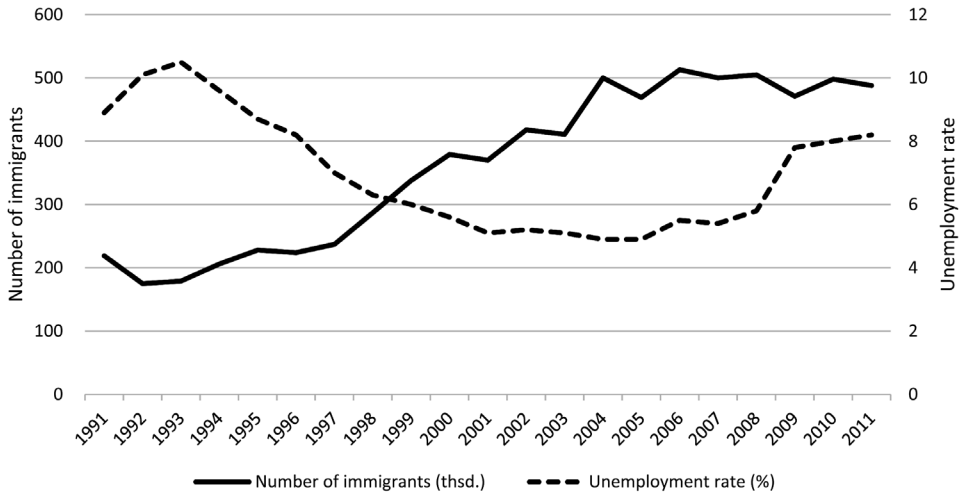


FIG. 1. **Immigration and unemployment rate in United Kingdom (1991–2011)**

Source: compiled by the authors, the United Kingdom Office for National Statistics.

it easier for British citizens to bring foreign spouses into the country. A sharp increase in immigration was noted in 2004 when 10 new members joined the EU. This increase can be explained by the free movement of persons, wage differences, and higher unemployment rates in the new member states. Also, due to the recession, migrant workers began to leave the United Kingdom and come back home (2009), but this is only a temporary effect, and an increase of immigration is expected in the future (Green, 2011).

The derivation of the model was based on the assumptions that the residuals of the model are normally distributed, that its variables are endogenous in the long term but not necessarily in the short term.

The theoretical basis for the model selection is based on Islam (2003), Sibanda (2008), and Fromentin (2012) studies. These studies have shown that immigrants influence the labour market (unemployment and wages) in the host countries. Thus, the model used in this study can be summarized as follows:

$$IM_t = f(U_t, W_t, Y_t),$$

$$U_t = f(IM_t, W_t, Y_t),$$

$$W_t = f(IM_t, U_t, Y_t),$$

$$Y_t = f(IM_t, W_t, U_t),$$

here IM_t – immigration in time t ;

U_t – unemployment rate in time t ;

W_t – real wages in time t ;

Y_t – real Gross Domestic Product in time t .

The finalized theoretical model takes the following form:

$$y_t = \alpha_0 + \beta_1 y_{t-1} + \varepsilon_t.$$

In this case, y_t is the vector composed of four elements: the extent of immigration, the unemployment rate, real hourly earnings, and the real GDP; α_0 is the vector of constant terms; ε_t represents the error term. This equation represents a general model which will be used as a reference to econometric calculations.

Research hypotheses

To illustrate the application of the study's perspective, two hypotheses about the impact of immigration on unemployment and wages were formulated.

The first hypothesis states that there is a positive relationship between the extent of immigration and unemployment. It is proposed that immigrants displace natives in the labour market. Migrants usually have the same or similar skills as natives in the host country, so immigrants compete with local workers in the labour market. Because of this competition, unemployment in the host country increases. Economic theory suggests that immigrants usually under-price themselves in the labour market of the host country; as a result, they are more preferred by employers as compared with native workers. Therefore, a positive relationship is expected between immigration and unemployment rate in the host country.

The second hypothesis assumes the existence of a negative relationship between the extent of immigration and wages in the host country. Labour migrants increase labour supply in the host country, so the pressure on wages in the labour market increases. With reference to economic theory of supply and demand, an increase in supply, when other conditions remain the same, reduces the price of the commodity. In this case, an increase in labour supply reduces workers' wages.

Data stationarity test

The first step in an empirical study is to determine whether the model variables are stationary (variables' degree of integration determines the estimation procedure of the model). First, it is important to estimate the stationarity of the series, because stationarity or non-stationarity of a series influences its behaviour. Second, non-stationary data are not suitable for econometric modelling, because they give a spurious regression. Third, using non-stationary data in econometric modelling invalid standard assumptions for the asymptotic analysis are given.

A time series data are made stationary by differencing them. If a series is differenced one time to become stationary, this series is integrated of order I (1). If a series is integrated of order I (b), this series is differenced b times to make it stationary. In this study, for determining the stationarity of a series, the augmented Dickey–Fuller test will be used.

The augmented Dickey–Fuller test (ADF) is a stricter version of the Dickey–Fuller test (DF). The DF test can sometimes reject the null hypothesis, even if this hypothesis is correct. The ADF test estimates three basic models for each variable:

- random walk (without a constant or deterministic trend);
- random walk with drift (with a constant but without a deterministic trend);
- random walk with drift and trend (with a constant and a deterministic trend).

In this test, the null hypothesis assumes that a variable is non-stationary unit root process, and the alternative hypothesis assumes that the series is stationary and there is no unit root ($H_0: \nu = 0$, $H_A: \nu < 0$). During this test, t and F statistics for all three models are obtained. These statistics are compared with theoretical Dickey–Fuller τ -distribution and F -distribution values. If the calculated t statistic is lower than the theoretical τ -distribution value, the null hypothesis is rejected, and the series is stationary. The values of the t statistic are calculated for all three basic models, and if at least one of the calculated t values is larger than the theoretical τ value, to estimate whether a variable is stationary, the calculated F statistic values are compared with the theoretical values of F (if the calculated F statistic is larger than the theoretical F value, the null hypothesis, depending on the process (a, b or c) that generates a variable, is rejected).

The ADF unit root test results are presented in Table 1.

TABLE 1. **Augmented Dickey–Fuller unit root test results**

Variables	Random walk	Random walk with drift		Random walk with drift and trend		
	t_1	t_2	F_1	t_3	F_2	F_3
LIM	1.7347	-0.613	1.7282	-1.9475	2.4362	1.8992
LW	2.9501	-2.8267	12.3844**	-0.1465	7.7093**	3.7319
LU	-0.3742	-1.06	0.589	0.4804	1.3365	1.9748
LY	2.0586	-2.2051	5.1716*	-0.4453	3.2668	2.3266
DLIM	-1.9851**	-3.1966**	5.1506*	-4.1431**	6.3278**	9.4373**
DLW	-1.2579	-3.7018**	7.1263**	-5.0435**	9.4720**	13.8135**
DLU	-2.8153**	-2.7715*	3.8709	-3.9635**	5.4973*	8.2056**
DLY	-1.3979	-2.5977	3.381	-3.5615*	4.3449	6.5089*
Critical values (5%)	-1.95	-3.00	5.18	-3.60	5.68	7.24
Critical values (10 %)	-1.60	-2.63	4.12	-3.24	4.67	5.91

Notes: * and ** represent the significance at the 10% and 5% levels.

Source: calculated by the authors with the use of R software.

It should be noted that, first, all estimated variables – immigration, real wage, unemployment rate, and real GDP – were converted to logs (relevant logarithm abbreviations of the variables are LIM, LW, LU, and LY). Then the ADF test for logarithm variables and later the ADF test for once differentiated logarithm variables were done (abbrevia-

tion with the first letter D). Table 1 demonstrates that the variables of the model had been non-stationary, but after the first differencing all variables of the model became stationary. Because the differentiated real GDP variable was stationary at a 90% confidence level, an additional ERS (Elliott, Rothenberg, and Stock) unit root test for this variable was done. The calculated test statistics (-3.4966) was lower than the theoretical value (-3.19) at a 95% confidence level, so the null hypothesis was rejected and the alternative hypothesis, stating that the process is stationary, was accepted. Thus, the variables of the model are integrated of order one $I(1)$ at a 5% significance level.

Cointegration test

Cointegration is defined as a long-run relationship among the variables. In this study, cointegration allows to determine whether the impact of immigration on the host country's labour market in the long run does exist. When two variables of the same order of integration are combined, the result will be $I(1)$. But if the variables of different orders of integration are combined, the combination will have an integration of the largest order. Therefore, it is important to note that the variables can be cointegrated only if these variables are integrated of the same order. Such a condition eliminates the problem of spurious regressions.

Tests for cointegration can be taken in accordance with the Engle–Granger approach and the Johansen technique. The Johansen technique is preferred to the Engle–Granger approach because it is more suitable for use in models with more than two variables; it allows to determine the exact number of cointegrating vectors and to avoid the two-step evaluation. So, in this study, the Johansen procedure was used.

The Johansen technique allows a number of cointegration relationships to be determined using two tests based on the eigenvalues of a matrix (λ trace and λ max) (Johansen, 1988). The null hypothesis of the λ trace test assumes that there are r or less than r cointegration relationships among the series; the alternative hypothesis assumes that there are more than r cointegrating vectors. The null hypothesis of the λ max test assumes that there are r cointegration relationships among the series; the alternative hypothesis assumes that there are $r + 1$ cointegrating vectors. The null hypothesis is rejected when the calculated λ trace and λ max values are larger than the critical values of the Johansen statistics at the selected significance level.

The Johansen cointegration test results are summarised in Table 2.

Data in Table 2 show that there is one cointegrating vector. The λ trace statistic rejects the hypothesis that the model has no cointegrating vector, but cannot reject the hypothesis that there is 1 or less, 2 or less and 3 or less cointegrating vectors. So, the number of cointegrating vectors according to λ trace statistics is 1. The λ max statistics rejects the hypothesis that the model has no cointegrating vector and therefore cannot reject the hypothesis that the model has 1, 2 or 3 cointegrating vectors. Thus, the number of cointegrating vectors according to the λ max statistics is 1.

TABLE 2. The Johansen cointegration test results

H_0	λ trace statistics	Critical value (5%)	λ max statistics	Critical value (5%)
$r = 0$	90.83**	62.99	49.50**	31.46
$r \leq 1$	41.33	42.44	21.04	25.54
$r \leq 2$	20.28	25.32	11.63	18.96
$r \leq 3$	8.66	12.25	8.66	12.25

Source: calculated by the authors with the use of R software.

The structural vector error correction model

According to Granger's representation theorem, the existence of a cointegrated system implies the presence of an error correction mechanism. This mechanism is written in the following way (Granger, 1988):

$$\Delta Y_t = \alpha + \sum_{i=1}^{p-1} \beta_j \Delta Y_{t-i} + \lambda ECT_{t-1} + e_t,$$

here Δ – operator of the first difference, i. e. $\Delta Y_t = Y_t - Y_{t-1}$;

p – number of lags;

λ – error correction coefficients;

e_t – residuals of the model.

The existence of cointegration relationships (earlier it had been found that there was one cointegrating vector) enabled the estimation of a vector error correction model. According to the equations' coefficients of determination, the quality of the estimated vector error correction model is correct. It should be noted that the residuals of the estimated model are not autocorrelated and are normally distributed. Additionally, all the error correction coefficients are significant. However, according to the VECM, no economic interpretations as to the impact of immigration on the labour market of the United Kingdom in the short run can be made. Therefore, based on the VECM, a structural vector error correction model was developed. According to the SVEC, the impulse–response functions, which show responses of the variables to the shocks of a particular variable, were found.

Table 3 presents data on the SVEC impulse–response functions established in order to estimate the short-term impact of immigration on the labour market of the United Kingdom from 1991 to 2010.

TABLE 3. Structural vector error correction model

	LW	LU
LIM_{t-1}	-1.5255	1.6616
LW_{t-1}	0.2501	-0.3183
LU_{t-1}	0.3955	0.0545
LY_{t-1}	1.5280	-0.9142

Source: calculated by the authors with the use of R software.

The second column of Table 3 shows that immigration has a negative influence on real wages in the short term. If the extent of immigration to the United Kingdom increases by 1 standard deviation, in the next period real wages decrease by 1.5255 standard deviations. This short-term dependence confirms the hypothesis that there is a negative relationship between the extent of immigration and wages in the host country. Labour migrants increase labour supply in the host country, so the pressure on wages in its labour market increases. Because immigrants usually agree to work for lower wages than native workers, labour cost in the host country decreases.

The negative relationship between the level of immigration and wages was found by Glitz (2006) in the study of Germany (10% increase in immigrant skills reduces relative wages by 0.49% to 0.58%), Nickell and Salaheen (2008), Reed and Latorre (2009), Manacorda et al. (2010) in the studies of the United Kingdom. The study of Nickell and Salaheen (2008) has shown that a 1 percentage point increase in the number of immigrants decreases the average wage by 0.04%. Authors also found that a 10 percentage point rise in the proportion of immigrants is associated with a 5 percent reduction in wages. Reed and Latorre (2009) found that a 1 percentage point increase in the share of migrants in the United Kingdom working-age population depresses wages by 0.3%. Manacorda et al. (2010) have found that immigrants increase wage inequality between skilled and unskilled labour force in the United Kingdom – a 10% increase in immigration increases the wage gap between skilled and unskilled natives by 2%.

The results presented in Table 3 show that immigration has a positive impact on the unemployment in the short term: a 1 standard deviation increase in the extent of immigration increases unemployment by 1.6616 standard deviations. This relationship confirms the economic theory and the hypothesis of the study. Because immigrants usually under-price themselves in the labour market of the host country, they are more preferred by employers as compared to native workers. Such a situation may lead to an increase of competition and social pressure in the host country. Moreover, immigrants (especially unskilled persons) who cannot find a job in the host country increase the country's unemployment rate.

A positive relationship between immigrants and unemployment was found by Venturini and Villosio (2004) in Italy (a 1% increase in the extent of immigration increases unemployment by 0.4%), by Glitz (2006) in Germany (he found a displacement effect of 4 unemployed native workers for every 10 immigrants who find a job), Sibanda (2008) in South Africa (a 1% increase in the number of immigrants increases unemployment by 0.1%). In accordance with the authors' studies, the impact of immigration on the labour market of the United Kingdom was estimated, and a positive relationship between the level of immigration and unemployment was found. Dustman et al. (2003) estimated that an increase in immigration amounting to one per cent of the non-immigrant population

would lead to an increase by 0.18 percentage points in the non-immigrant unemployment rate. Dustman et al. (2005) have found that an increase in the extent of immigration by 1% leads to a 0.098% increase in unemployment of intermediate education group workers. A study by Portes and French (2005) revealed that a 1% increase in immigration of 8 new EU member states increased the unemployment rate in local regions of the country by 0.089% (with the highest impact on the agricultural sector).

In summary, the structural vector error correction model results are fully consistent with the hypotheses of the study: the short-term impact of immigration on the labour market of the United Kingdom is negative, because immigration reduces real wages and increases unemployment.

The long-term equilibrium

As in this study the variables of the model have been found to be cointegrated, in this section we present the modelled equations of the long-term equilibrium. These equations were created in order to estimate the impact of immigration on the labour market of the United Kingdom in the long run (data from 1991 to 2010). Based on the values of Akaike's information criterion (AIC) and by checking the autocorrelation of the residuals and the normality of the residuals' distribution, the best representative linear equations for the variables were found. The estimation results are presented in Tables 4 and 5.

TABLE 4. The long-term equilibrium for the real wage variable

	<i>LW</i>	<i>p-value</i>
<i>LIM</i>	-0.0812***	0.0099
<i>LU</i>	-0.0524***	0.0028
<i>LY</i>	0.3310****	1.08E-14
<i>t</i>	0.0342****	1.87E-15

Notes: **, *** and **** show the significance at the 5%, 1% and 0.1% levels.

Source: calculated by the authors with the use of R software.

TABLE 5. The long-term equilibrium for the variable of unemployment

	<i>LU</i>	<i>p-value</i>
<i>LIM</i>	-0.6342**	0.0129
<i>LW</i>	-3.0200	0.1262
<i>LY</i>	-2.7705**	0.0488
<i>C</i>	55.4556****	0.0002
<i>t</i>	0.2108***	0.0012

Notes: **, *** and **** show the significance at the 5%, 1% and 0.1% levels.

Source: calculated by the authors with the use of R software.

Table 4 shows that immigration to the United Kingdom has a negative impact on real wages in the long term. A 1% increase in the extent of immigration, *ceteris paribus*, reduces the real wages by 0.0812% (1% significance level). This long-run relationship confirms the hypothesis of the study that there is a negative relationship between the number of immigrants and the real wages in the host country. Immigrants increase labour supply in the host country, so the pressure on wages in the labour market increases. Moreover, according to economic theory of supply and demand, an increase in supply,

when other conditions remain the same, reduces the price of the commodity (wages of workers). In addition, real wages in the country are influenced by unemployment rate (negative correlation) and real GDP (positive correlation) in the long term.

The results presented in Table 5 show a negative relationship between the immigration and unemployment in the long term. A 1% increase in the level of immigration, *ceteris paribus*, decreases unemployment by 0.6342% (5% significance level). This relationship rejects the first hypothesis of the study. This situation can be explained by the fact that immigrants create more jobs than they fill in due to the growth of demand (Altonji et al., 1991). Immigrants, although occupying jobs, create new jobs through their demand for goods and services. Moreover, there is a negative relationship between unemployment and real GDP in the long run.

In summary, the impact of immigration to the United Kingdom on its labour market is ambiguous in the long run. On the one hand, immigration, *ceteris paribus*, reduces the unemployment rate, whereas on the other hand it leads to a reduction of real wages in the country.

Conclusions

The impact of the extent of immigration on the labour market of the United Kingdom in the recent years is an important issue and an object of public and political debates. Moreover, the problem of immigration in the country will remain relevant in the future, because United Kingdom will be the EU's most populous nation in 2060 (an influx of 7.7 million migrants over 2008–2060). The government and society of the United Kingdom believe that immigrants take away jobs from native-born workers and increase pressure on wages and resources. However, a review of the United Kingdom literature and studies in other countries show that there is no clear answer to the question how immigration influences the labour market of the host country. The economic impact of immigration varies depending on time, place, geographical regions, and consequences.

In order to estimate the impact of immigration on the labour market of the United Kingdom in the short term and in the long term using data from 1991 to 2010, an econometric analysis was carried out. The study has shown that once differentiated, the logarithm variables (the extent of immigration, real hourly earnings, unemployment rate, and real GDP) are stationary and integrated of order one $I(1)$. This allowed to find whether there is a long-run relationship among the variables and to determine the number of cointegrating vectors (1).

The existence of one cointegrating vector enabled to compile a structural vector error correction model. Results of applying the model have revealed that immigration to the United Kingdom influences its labour market negative by in the short run. These results confirmed the hypotheses of the study about the impact of immigration on the

country's labour market – real wages and unemployment rate. Immigration was found to reduce real wages and increase unemployment in the short term. This is because immigrants increase labour supply in the host country, so the pressure on wages increases. Furthermore, immigrants usually under-price themselves in the labour market of the host country, so they are more preferred by employers as compared with native workers.

Because a long-run relationship between variables had been found, equations of a long-term equilibrium for the variables of real wages and unemployment rate were modelled. These linear regression models showed an ambiguous impact of immigration on the labour market of the United Kingdom in the long term. The extent of immigration, *ceteris paribus*, was found to reduce the unemployment rate in the country, but it leads to a decrease in the real wages. There is a negative relationship between immigration and unemployment in the long run because, occupying jobs, immigrants at the same time create new jobs through their demand for goods and services.

REFERENCES

- Altonji, J., Card, D. (1991). The effects of immigration on the labor market outcomes of less-skilled natives. In: J. M. Abowd, R. B. Freeman (eds.). *Immigration, Trade and the Labor Market* (p. 201–234). Retrieved from <http://davidcard.berkeley.edu/papers/natives.pdf>
- Borjas, G. J. (1994). The economics of immigration. *Journal of Economic Literature*, Vol. 22, p. 1667–1717. Retrieved from http://www.stanford.edu/group/scspi/_media/pdf/Reference%20Media/Borjas_1994_Immigration.pdf
- Dustmann, C., Fabbri, F., Preston, I. (2005). The impact of immigration on the UK labour market. *The Economic Journal*, Vol. 115, p. 324–341. Retrieved from <http://eprints.ucl.ac.uk/14317/1/14317.pdf>
- Dustmann, C., Fabbri, F., Preston, I., Wadsworth, J. (2003). The local labour market effects of immigration in the UK. Retrieved from <http://eprints.ucl.ac.uk/14331/1/14331.pdf>
- European Commission and Economic Policy Committee. (2009). *The 2009 Ageing Report: economic and budgetary projections for the EU-27 Member States (2008–2060)* (European Economy 2009-2). Retrieved from European Commission website: http://ec.europa.eu/economy_finance/publications/publication14992_en.pdf
- Fiddick, J. (1999). *Immigration and Asylum*. Retrieved from www.parliament.uk/briefing-papers/RP99-16.pdf
- Fromentin, V. (2012). The relationship between immigration and unemployment: The case of France. *Economic Analysis and Policy*, Vol. 43, p. 51–66. Retrieved from <http://www.eapjournal.com/archive/forthcoming/forthcomingév42èi3èVincent-Fromentin.pdf>
- German Marshall Fund of the United States. (2008). *Transatlantic Trends: Immigration – Key Findings*. Retrieved from www.transatlantictrends.org/trends/doc/TTI_2008_Final.pdf
- Glitz, A. (2006). The labour market impact of immigration. Quasi-experimental evidence. Retrieved from <http://cream-migration.org/files/aussiedler.pdf>
- Granger, C. W. J. (1988). Some recent developments in a concept of causality. *Journal of Econometrics*, Vol. 39, p. 199–211. Retrieved from <http://www.sciencedirect.com/science/article/pii/0304407688900450>
- Green, A. E. (2011). *Impact of economic downturn and immigration*. Retrieved from <http://webarchive.nationalarchives.gov.uk/20120919132719/www.communities.gov.uk/documents/corporate/pdf/1854800.pdf>

Hatton, J. T., Tani, M. (2005). Immigration and inter-regional mobility in the UK, 1982–2000. *The Economic Journal*, Vol. 115, issue 507, p. 342–358. Retrieved from <http://web.warwick.ac.uk/res2003/papers/Hatton.pdf>

Islam, M.A. (2003). Labour market effects of immigration: Evidence from Canada. Retrieved from <http://library.usask.ca/theses/available/etd-08092003-135235/unrestricted/AsadThesis.pdf>

Johansen, S. (1988). Statistical analysis of cointegrating vectors. *Journal of Economic Dynamics and Control*, Vol. 12, p. 31–254. Retrieved from <http://nhjy.hzau.edu.cn/kech/hgjx/Article/Upload-Files/tese/xuexiziyuan/jdwxxd/lwl/12.pdf>

Lemos, S., Portes, J. (2008). The impact of migration from the new European Union Member States on native workers. Retrieved from <http://research.dwp.gov.uk/asd/asd5/wp52.pdf>

Manacorda, M., Manning, A., Wadsworth, J. (2010). The impact of immigration on the structure of wages: Theory and evidence from Britain. Retrieved from http://personal.lse.ac.uk/manacorda/manacorda_manning_wadsworth.pdf

Migration Advisory Committee. (2012). Analysis of the impacts of migration. Retrieved from <http://www.ukba.homeoffice.gov.uk/sitecontent/documents/aboutus/workingwithus/mac/27-analysis-migration/01-analysis-report/analysis-of-the-impacts?view=Binary>

MORI. (2008). Political monitor trends: The most important issues facing Britain today. Retrieved from www.ipsos-mori.com/content/turnout/political-monitor-trends-the-most-important-issues.ashx.

Nickell, S., Salaheen, J. (2008). The impact of immigration on occupational wages: Evidence from Britain. Retrieved from <http://www.bos.frb.org/economic/wp/wp2008/wp0806.pdf>

Portes, J., French, S. (2005). The impact of free movement of workers from Central and Eastern Europe on the UK labour market: early evidence. Retrieved from <http://campaigns.dwp.gov.uk/asd/asd5/WP18.pdf>

Reed, H., Latorre, M. (2009). The economic impacts of migration on the UK labour market. Retrieved from http://www.ippr.org.uk/images/media/files/publication/2011/05/labour%20market%20impacts_1678.pdf

Sibanda, N. (2008). The impact of immigration on the labour market: Evidence from South Africa. Retrieved from <http://ufh.netd.ac.za/bitstream/10353/207/1/SibandaN%20thesis.pdf>

Taylor, A. M. (1995). Peopling the pampa: On the impact of mass migration on the River Plate, 1870–1914. Retrieved from <http://www.nber.org/papers/h0068.pdf?newwindow=1>

United Kingdom Office for National Statistics. (2012). 2.01a LTIM Citizenship, 1991–2011. Retrieved from www.ons.gov.uk/ons/rel/migration1/long-term-international-migration/2011/2-01a-ltim-citizenship--1991-2011.xls

United Kingdom Office for National Statistics. (n.d.). Labour Market Statistics – Integrated FR - Unemployment by age & duration. Retrieved from <http://www.ons.gov.uk/ons/datasets-and-tables/data-selector.html?cdid=LF2Q&dataset=lms&table-id=9>

Venturini, A., Villosio, C. (2004). Labour market effects of immigration: An empirical analysis based on Italian data. Retrieved from <http://www.ilo.org/public/english/protection/migrant/download/imp/imp69.pdf>