

# DANMARKS NATIONALBANK

10 JANUARY 2019 — NO. 1

## Intra-EU labour mobility dampens cyclical pressures



### EU labour mobility dampens labour market pressures

When the unemployment gap narrows by 1 percentage point, inflows of EU labour increase the labour force in an EU country by 0.1 per cent p.a., which has a certain countercyclical impact.

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### Eastern enlarge- ments increase access to EU labour

The enlargements of the EU led to large labour migration flows from Eastern to Western Europe. This expanded the labour force considerably in several of the countries currently experiencing labour shortages.

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### Higher wages ensure access to EU labour

Large income differences exist between Eastern and Western Europe. As a result, Western European firms are still able to attract EU labour during boom periods.

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## Pressure on labour markets in parts of the EU

European labour market pressures are rising, albeit with considerable differences across countries, cf. Chart 1. In, inter alia, Denmark, Germany, the Netherlands and Eastern European countries such as Poland, a growing number of firms are reporting labour shortages, while shortages are less pronounced in Southern Europe.

Intra-EU labour mobility addresses some of the labour shortages because labour migrates to countries with limited spare resources. At the same time, cyclical fluctuations in the home countries of the workers are stabilised when migration flows are from countries with high unemployment. In other words, labour mobility helps to reduce cyclical fluctuations.

In Denmark, inflows of foreign labour during the current boom period, i.e. since 2013, has increased the labour force by approximately 70,000,<sup>1</sup> including more than 40,000 from other EU member states. This has served to ease pressures on the Danish labour market.

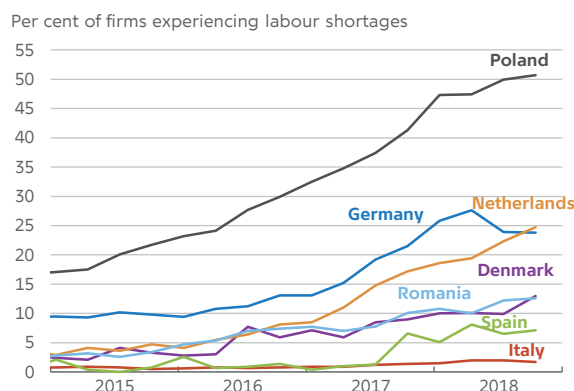
## Intra-EU labour mobility has increased

Intra-EU labour mobility has increased, cf. Chart 2. The number of EU citizens of working age (aged 20-64) living in an EU member state other than their own has risen by close to 6 million since 2004 and currently totals almost 12 million people, or 4 per cent of the EU population.<sup>2</sup>

Labour mobility developments are driven by both structural and cyclical factors. The key structural factor was the enlargements of the EU in 2004 and

**Greater labour shortages in Northern and Eastern Europe than in Southern Europe**

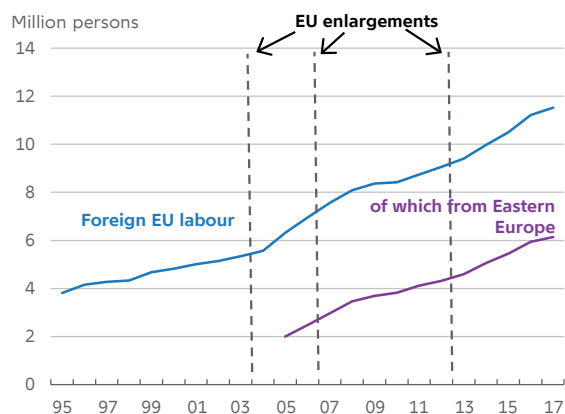
Chart 1



Note: European Commission survey on labour shortages as a factor limiting production in manufacturing firms.  
 Source: Macrobond.

**Increased labour mobility driven by EU enlargements**

Chart 2



Note: EU citizens aged 20-64 living in an EU member state other than their own.  
 Source: Eurostat.

1 See Ellermann-Aarslev (2018) for a detailed analysis of foreign labour in Denmark during the current boom period.

2 The number of EU citizens of working age living in an EU member state other than their own is a proxy for foreign EU labour. Data may, to some extent, be impacted by students, pensioners and accompanying family members with no labour market attachment.

2007, when 12 countries, primarily from Central and Eastern Europe, joined the EU.<sup>3</sup>

This is underpinned by a relatively clear division between countries receiving and sending labour migrants. Thus, a large percentage of the working-age population of the new Eastern European member states has migrated to Western Europe, cf. Chart 3. For instance, foreign EU citizens account for more than 6 per cent of the population of large receiving countries such as Germany and the UK, but for less than 1 per cent in Eastern European countries. In Romania, the share of the population living in an EU member state other than their own surged from 2.5 per cent in 2004 to 20 per cent in 2017. In Bulgaria, the share increased from about 2 per cent to 12.5 per cent during this period.

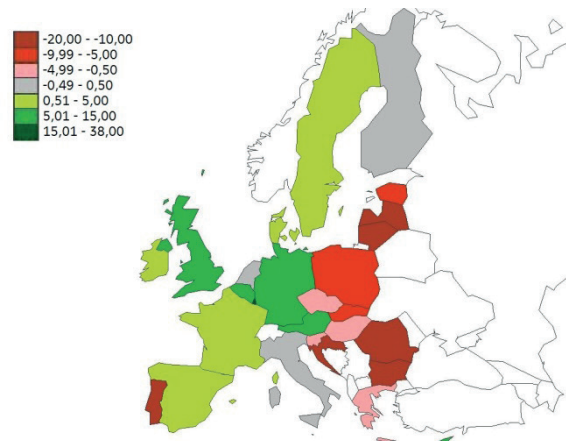
These migration flows should be seen especially in the context of the large income differences across countries, cf. Chart 4. As a case in point, the income levels in Romania and Bulgaria are half those of Germany and the UK.

In addition to the EU enlargements, labour mobility may also have been supported by factors such as better language skills and internationalisation of education programmes. Finally, increased use of foreign labour could, in itself, have contributed to a self-reinforcing spiral through network effects.

The cyclical factor is reflected in the fact that labour mobility tends to fluctuate with the economy. During a boom period, more people will tend to migrate to countries with job vacancies, while fewer people will migrate during an economic downturn. This pattern is currently reflected in an increase in intra-EU labour migration following a slowdown in the immediate aftermath of the financial crisis.

Eastern Europe is primarily a net sender of labour

Chart 3

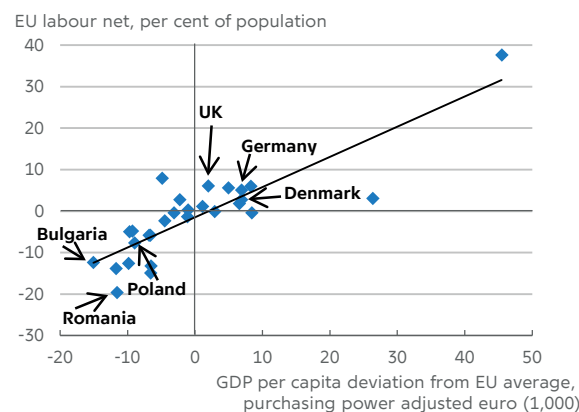


Note: Net receiving and sending countries of foreign EU labour. Defined as foreign EU citizens of working age relative to the population less the proportion of the member state's citizens living in an EU member state other than their own in 2017. Green countries are net receiving countries, while red countries are net sending countries. Grey means that a member state is neither a net receiving nor a net sending country of foreign labour.

Source: Eurostat.

Higher incomes attract foreign EU labour

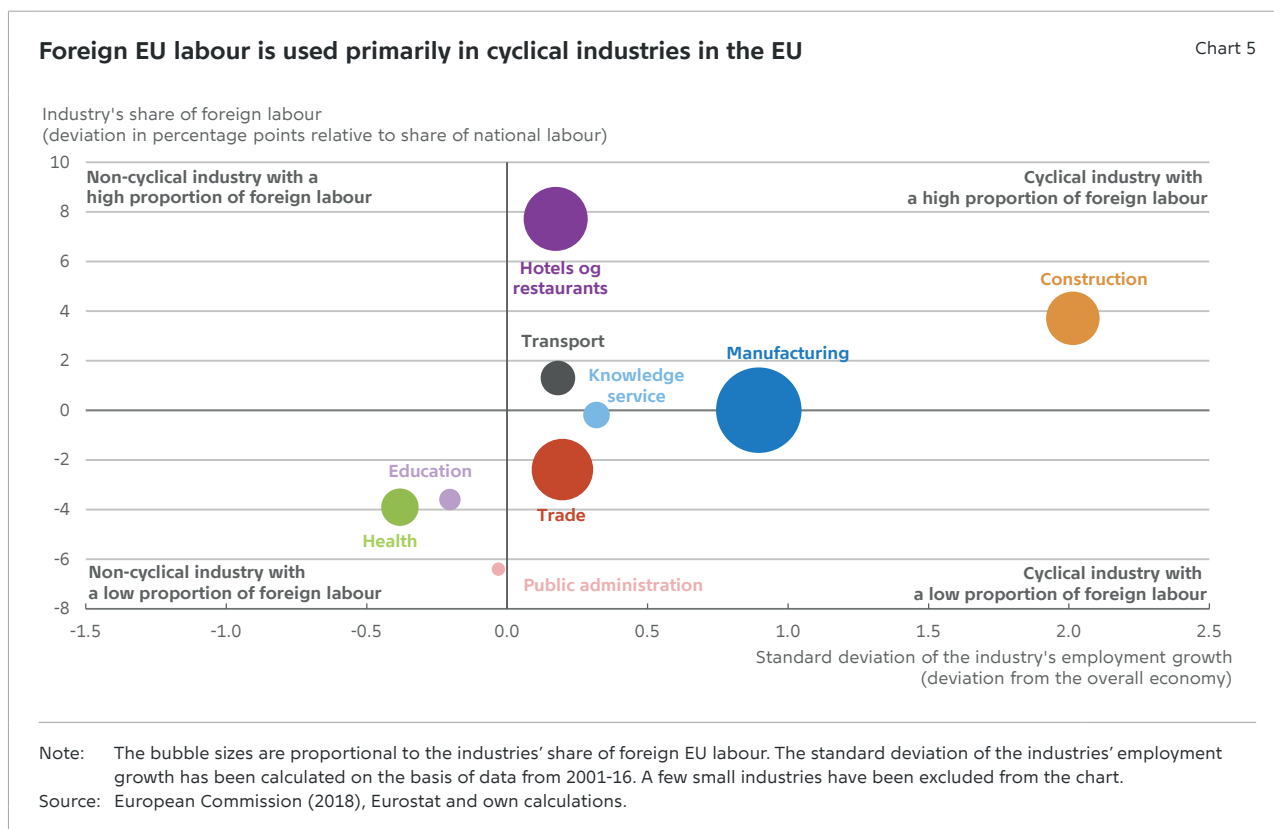
Chart 4



Note: GDP per capita relative to foreign EU citizens of working age living in the member state less the number of that member state's citizens living in an EU member state other than their own relative to the population in 2017.

Source: Eurostat and European Commission.

<sup>3</sup> In 2004, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia joined the EU. Since then, two EU enlargements have taken place. In 2007, Bulgaria and Romania joined the EU, followed by Croatia in 2013. During a transitional period after the EU enlargements, several EU member states introduced restrictions on labour market access. This may have delayed the full impact on labour mobility.



## EU labour is used primarily in cyclical industries

Major differences exist in the concentration of foreign labour across industries. The percentage of EU labour relative to national labour is particularly high in cyclical industries such as construction, hotels and restaurants, cf. Chart 5. Conversely, the concentration is low in industries such as public administration, which are less impacted by cyclical fluctuations. This indicates that foreign labour is used primarily in those segments of the economy that traditionally experience labour shortages during boom periods.

Moreover, language barriers may present less of an obstacle in the most cyclical industries. These industries also tend to rely more frequently on short-term contracts, for instance due to seasonal work and

temporary postings. This could contribute to increasing demand for foreign labour.

## Intra-EU labour mobility helps to dampen cyclical pressures

An estimation of intra-EU labour flows examines whether the single market acts as a cyclical stabiliser in the EU by facilitating labour migration from member states with high unemployment to member states with low employment.

The estimation results indicate that inflows of foreign labour increase when the labour market tightens, cf. Table 1.<sup>4</sup> Specifically, the estimation shows that a 1 percentage point reduction in the unemployment gap increases inflows of EU labour by an average of

<sup>4</sup> A panel model of net bilateral flows of foreign EU citizens has been estimated based on Ho and Shirono (2015). See the Appendix for further details.

0.0031 per cent of the labour force from each of the other 27 EU member states, cf. Table 2 in the Appendix.<sup>5</sup> Consequently, EU labour expands the labour force by a total of approximately 0.1 per cent annually when the unemployment gap of the receiving country narrows by 1 percentage point. As a case in point, a narrowing of the Danish unemployment gap by 30,000 persons is estimated to increase foreign labour from other EU member states by 2,500 persons annually.

Cyclically driven inflows of labour from other EU member states may reflect several factors. If firms experience labour shortages, they may try to attract foreign labour, e.g. by offering migrant workers higher wages than they receive in their home countries, the “pull” effect. The incentive to seek employment abroad also increases when unemployment rises in the worker’s home country, the “push” effect.

Calculations show that inflows of foreign labour are driven by the unemployment gap of the receiving country, i.e. a “pull” effect rather than a “push” effect. This means that migration from Eastern to Western Europe is driven by the cyclical position of the country of destination. In other words, income gaps between Eastern and Western Europe enable Western European firms to attract migrant labour from Eastern Europe during boom periods – regardless of the cyclical position of the migrants’ home countries.

On the other hand, if the focus is on Western European countries only, the unemployment gap of the sending country is equally as important as the unemployment gap of the receiving country. So cyclically driven intra-EU labour mobility in Western Europe is driven by the situation in both the home country and the destination country.

The estimation also shows that income gaps and other structural factors such as a common language, the number of migrants from the sending country already living in the receiving country and EU enlargements also support intra-EU labour migration flows. Conversely, differences in structural unemployment between the sending and the receiving country have no impact on the stock of foreign labour.

**Low unemployment increases inflows of foreign EU labour**

Table 1

Driver of foreign EU labour inflows	Effect
Unemployment gap in receiving country	Negative
Unemployment gap in sending country	None
Difference in structural unemployment between receiving and sending country	None
Relative GDP per capita in receiving and sending country	Positive
Common language in receiving and sending country	Positive
Existing number of immigrants from sending country in receiving country	Positive
2004 EU enlargement	Positive

Note: The table presents the results of an econometric analysis of the drivers of the net bilateral migration flows of foreign EU labour. See Box 1 and Table 2 in the Appendix for a description of the approach.

Source: Own calculations based on data from the OECD, European Commission, Office for National Statistics, ONS, and Centre d’Etudes Prospectives et d’Informations Internationales, Cepii.

<sup>5</sup> The unemployment gap denotes the difference between actual and structural unemployment, i.e. the level of unemployment in the economy in a neutral cyclical position.

## Cyclically driven EU labour alone will not be able to stabilise Danish boom

Labour migration flows to Denmark from other EU member states surged during the overheating of the economy in the 2000s. This increase was driven partly by Denmark's cyclical position, but also to a substantial extent by other factors, especially the enlargements of the EU, cf. Chart 6.<sup>6</sup> Thus, the timing of the enlargements proved favourable to the Danish labour market.

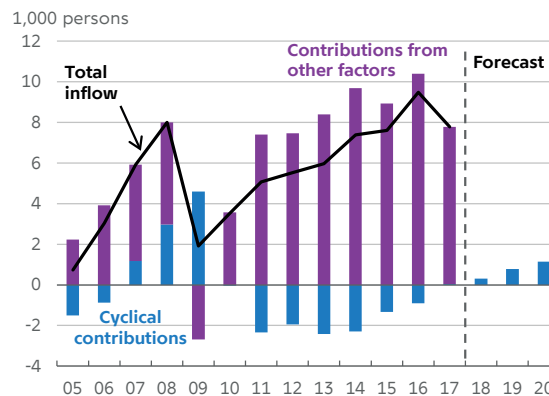
According to the model calculation and Danmarks Nationalbank's forecast for the unemployment gap, growing capacity pressures in the current boom period will attract 2,200 persons in the period towards 2020. Inflows account for a limited portion of the expected labour market growth, as employment is estimated to increase by a further 70,000 in the period towards 2020.<sup>7</sup> This highlights that cyclically driven inflows of foreign EU labour alone cannot stabilise cyclical fluctuations.

## Over time, narrowing wage gaps could make it more difficult to attract foreign labour

Unemployment is currently low in several large sending countries such as Poland and Romania. But according to the estimation, this has no major impact on the ability of e.g. Danish firms to attract EU labour. The reason is that Danish wages are generally much higher than those of most Eastern European countries. However, Eastern European incomes have been converging towards Western European levels since the 1990s, cf. Chart 7.

Income equalisation between Western and Eastern Europe provides a general disincentive for Eastern

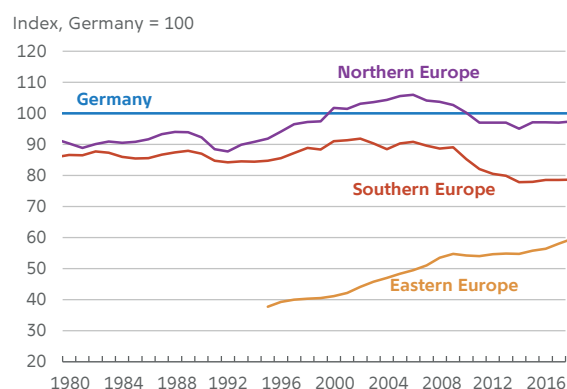
Foreign EU labour is attracted to Denmark during boom periods Chart 6



Note: Net inflows of foreign EU citizens to Denmark. Developments have been decomposed into contributions from the Danish unemployment gap and other factors on the basis of the econometric model in Box 1. Other factors include e.g. income gaps and EU enlargements. Data for 2015-17 is based on Statistics Denmark's compilation of the growth rate in the number of EU citizens in Denmark used to project the OECD's figures after 2014. The unemployment gap is based on Danmarks Nationalbank's calculation, cf. Danielsen et al. (2017).

Source: Own calculations based on data from the OECD, European Commission, Office for National Statistics, ONS, Centre d'Etudes Prospectives et d'Informations Internationales, Cepii, Statistics Denmark and Danmarks Nationalbank.

Eastern European income levels are converging towards Western European levels Chart 7



Note: Weighted average of purchasing power adjusted GDP per capita relative to Germany. Northern Europe comprises Austria, Belgium, Denmark, Finland, Ireland, Luxembourg, the Netherlands, Sweden and the UK. Southern Europe comprises Cyprus, France, Greece, Italy, Malta, Portugal and Spain (excluding Cyprus and Malta before 1991). Eastern Europe comprises Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

Source: European Commission and own calculations.

<sup>6</sup> The positive cyclical contribution to intra-EU labour flows in 2009 reflects, inter alia, the model's application of the unemployment gap the previous year. This is to ensure that the intra-EU labour flows are driven by the unemployment gap – not the other way around.

<sup>7</sup> See Danmarks Nationalbank (2018).

Europeans to seek employment abroad. If incomes continue to converge, a “pull” effect in the receiving country may eventually no longer be sufficient to attract foreign labour. A “push” effect in the sending country will also be required, such as high unemployment, which is already the case for intra-Western European labour mobility.

Given that the percentage of the population in Eastern Europe that is of working age is expected to decline, this will also imply that workers will increasingly remain in their home countries. Overall, these factors indicate that it may gradually become more difficult for Western Europe to attract Eastern European labour during boom periods.

## Intra-EU labour mobility can be further enhanced

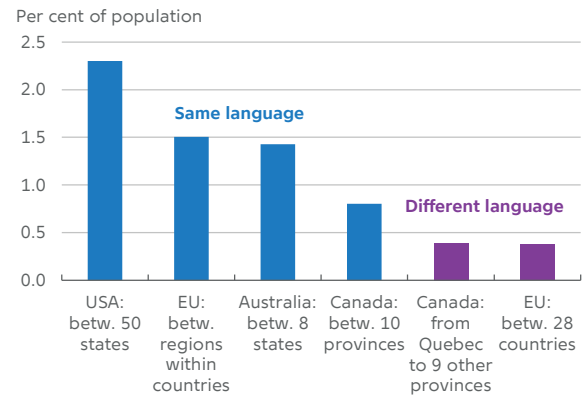
Although intra-EU labour mobility has increased, it still remains low relative to labour mobility between states and provinces in the USA, Australia and Canada, cf. Chart 8. In the EU, about 0.3 per cent of the population moves to an EU member state other than their own each year, while 2.4 per cent of the US population moves to another state.

The relatively low intra-EU mobility may be explained by a number of structural factors, especially language and cultural differences. The significance of language differences can be illustrated by annual mobility flows in the EU matching those seen between Canadian provinces with different languages.

Initiatives that could deepen the integration of EU labour markets going forward include increased recognition of professional qualifications and education programmes across countries and easier access to transfer pension rights.<sup>8</sup>

**Intra-EU labour mobility may be increased**

Chart 8



Note: Annual mobility flow as a percentage of the population. Population mobility for the USA, Canada and Australia, but labour mobility for the EU. Data covers 2014.

Source: OECD (2016).

<sup>8</sup> Apart from language differences, recognition of professional qualifications and transfer of pension rights constitute the greatest concerns among EU citizens in relation to working abroad, cf. Eurobarometer (2010).

## Literature

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## Appendix

### Regression model and data set

Box 1

This box describes the details underlying the econometric analysis on which e.g. the estimates of Chart 6 are based. A panel model inspired by Ho and Shirono (2015) is used in which bilateral EU migration flows are explained based on the following regression:

$$\text{net\_inflow}_{(i,j),t} = \beta_0 + \beta_1 \text{unemployment\_gap}_{i,t-1} + \beta_2 \text{unemployment\_gap}_{j,t-1} + \beta_3 \ln\_diff\_income_{(i,j),t-1} + \beta_4 \ln\_immigrantstock_{(i,j),t-1} + \beta_5 \text{comlang\_off}_{(i,j)} + d2004_t + \varepsilon_{(i,j),t}$$

- $\text{net\_inflow}_{(i,j),t}$ : Net migration flows from country  $j$  to country  $i$ . The figure is expressed as a percentage of the labour force of the receiving country,  $i$ .  $j$  is a vector containing all 28 EU member states.  $i$  is a vector containing Austria, Belgium, Denmark, Germany, Italy, Luxembourg, the Netherlands, Spain, Sweden and the UK. This vector reflects the largest net receiving countries of EU migrants relative to their population size.<sup>1</sup>
- $\text{unemployment\_gap}_{i,t-1}$ : The unemployment gap of the receiving country  $i$  (lagged) based on the European Commission. The lagged value is used to avoid reverse causality.
- $\text{unemployment\_gap}_{j,t-1}$ : The unemployment gap of the sending country  $j$  (lagged) based on the European Commission. The lagged value is used to avoid reverse causality.
- $\ln\_diff\_income_{(i,j),t-1}$ : The logarithm of the rate between GDP per capita in countries  $i$  and  $j$  (lagged) based on the European Commission. The lagged value is used to avoid reverse causality.
- $\ln\_immigrant\_stock_{(i,j),t-1}$ : The logarithm of the lagged value of the total immigrant stock from country  $j$  living in country  $i$ . The variable controls for network effects, i.e.

the tendency for migrants to move to countries with a large stock of people from their home country. Stocks are compiled by the OECD.

- $\text{comlang\_off}_{(i,j)}$ : A dummy indicating whether the countries share the same language. The variable is derived from Cepii.
- $d2004_t$ : A dummy assuming the value of 1 after the first Eastern enlargement of the EU in 2004.

The model is estimated using pooled OLS with cluster-robust standard errors, as the standard errors of the individual country pairs are not independent. The bilateral difference in unemployment gaps is divided into the unemployment gaps of the receiving and sending countries to distinguish between “pull” and “push” effects. The bilateral difference in structural unemployment, NAWRU, has been excluded because it was insignificant to the estimation. The results of the final estimation are shown in Table 2.

Data covers net bilateral migration flows of EU citizens within the EU in 2002-16 based on the OECD’s International Migration Statistics and may, to some extent, be impacted by students, pensioners and accompanying family members with no labour market attachment. Due to data shortages, receiving countries are limited to the largest net receiving countries of EU migrants relative to their population size.

Several robustness checks of the estimated effect of the unemployment gap have been performed, including excluding Luxembourg from receiving countries, excluding time dummies, including a time-specific dummy for each year and including only sending countries that are also included in receiving countries. This does not change the conclusion.

1. However, due to data shortages for bilateral migration flows, France, Ireland and Cyprus are not included among the receiving countries. For some years, data for certain receiving and sending countries is not included due to data shortages in the OECD database. These country pairs are reported as “missing” in the relevant year. The figures for all included countries are based on central population registers. However, reservations are made for differences in statistical definitions of migrant inflows and outflows. Definitions tend to vary in terms of the duration of the stay and whether or not seasonal workers are excluded. Several countries also indicate that the number of EU migrants could be underestimated due to registration challenges as a result of the free movement of labour. Some changes may also occur in the countries’ definitions of inflows and outflows. This was, for instance, the case in Denmark following a change of methodology in Statistics Denmark’s migration statistics after 2006.

**Regression results**

Table 2

net_inflow <sub>(i,j),t</sub>	Coefficient	Robust standard errors
Constant	-0.087***	0.024
unemployment_gap <sub>i,t-1</sub>	-0.0031***	0.0013
unemployment_gap <sub>j,t-1</sub>	0.0005	0.0005
ln_diff_income <sub>(i,j),t-1</sub>	0.048***	0.014
ln_immigrant_stock <sub>(i,j),t-1</sub>	0.0088***	0.0026
comlang_off <sub>(i,j)</sub>	0.050*	0.030
d2004 <sub>t</sub>	0.017***	0.003
Number of observations		4,138
R <sup>2</sup>		0.14

Note: The coefficients of unemployment\_gap<sub>i,t-1</sub> and ln\_diff\_income<sub>(i,j),t-1</sub> denote the average percentage change in the net migration inflows from each EU member state, *j*, to country *i* measured as a percentage of the labour force in country *i* when the unemployment gap the previous year in country *i* increases by 1 percentage point and the purchasing power adjusted GDP per capita the previous year increases by 1 percentage point in country *i* relative to country *j*, in which the migrants hold citizenship.

Source: OECD, European Commission, Office for National Statistics, ONS, Centre d'Etudes Prospectives et d'Informations Internationales, Cepii, and own calculations.

**ABOUT ANALYSIS**



As a consequence of Danmarks Nationalbank's role in society we conduct analyses of economic and financial conditions.

Analyses are published continuously and include e.g. assessments of the current cyclical position and the financial stability.

The analysis consists of a Danish and an English version. In case of doubt regarding the correctness of the translation the Danish version is considered to be binding.

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