

EU enlargement and migration: Assessing the macroeconomic impacts

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This paper considers the macroeconomic effects of the migration that followed the enlargement of the EU in May 2004. At that time the EU was expanded to include 10 New Member States (NMS) predominantly from Central and Eastern Europe. In the wake of accession the number of workers migrating to the EU-15 from the poorest of the NMS increased significantly. In part the result of the liberal immigration policies adopted, and restrictive policies adopted elsewhere, Ireland and the UK have become popular destination countries for NMS workers. Here we illustrate the potential macroeconomic consequences of these migration flows across Europe, highlighting the impacts in both the receiving and sending countries.

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Introduction

The expansion of the EU in May 2004 to include 10 New Member States (NMS) made it possible for workers in some Central and Eastern European countries to take up work in the EU-15. Some East to West migration was anticipated as a consequence of EU enlargement due to the income gap between most EU-15 and NMS countries. However, the pattern of immigration across the EU-15 has turned out differently from expected; in part because of transitional restrictions on labour mobility imposed in many of the EU-15 countries (see e.g. Boeri and Brücker, 2005). Here we illustrate the potential macroeconomic impacts of the migration flows that are likely to have come as a result of EU enlargement. Clearly it is difficult to measure what migration might have happened had the EU enlargement in May 2004 not taken place, and hence to measure the change in migration from EU enlargement. This is for two reasons. First, there are relatively few data available on migration post enlargement to be able to disentangle an explicit EU enlargement effect. Second, the data that exist are not necessarily comparable, across countries and time, or comprehensive. Bearing

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these considerations in mind, we construct a set of numbers intended to mimic the change in migration from EU enlargement. Next, taking these migration patterns as given, we assess the macroeconomic implications of these changes. Thus we do not consider any feedback from changes in income differentials and employment across countries to migration itself, which seems reasonable given that the macroeconomic consequences are generally relatively small.

We illustrate the potential scale of migration effects on GDP, inflation, unemployment, productivity, the current account balance, and GDP per capita allowing for different assumptions about the labour market characteristics of immigrants versus natives and of emigrants who return to their home country versus the rest of the home country population. We consider how the macroeconomic effects of migration depend on the structure of the sending and receiving economies, but also the skill composition and the nature of migration, in particular whether it is temporary or permanent. Our tool for analysis is the National Institute Global Econometric Model (NiGEM), which includes fully specified country models for most European countries.

The next section describes the magnitude of population movements between the Central and Eastern European NMS and EU-15 countries that might be described as directly related to the enlargement of the EU that took place on 1 May 2004. Importantly, although somewhat obviously, this differs from estimates of the population of NMS nationals in EU-15 countries, many of which arrived in advance of accession. Thereafter we discuss a simple simulation exercise using NiGEM that illustrates the macroeconomic impacts of these population movements. In this exercise cross country differences arise primarily from differences in the size of the shock, although other structural factors also prove to be important. The section that follows illustrates the sensitivity of the macroeconomic impacts of EU enlargement and migration in general to different assumptions about the migrant population, and discusses the importance of remittances and learning effects for the impacts on the source countries. A final section offers some conclusions.

EU enlargement and migration

The majority of the EU-15 countries have imposed immigration restrictions on NMS nationals, which effectively mean that the legislative barriers facing NMS nationals wanting to work or take up residence in these countries are little different following the enlargement of the EU in May 2004. Denmark, Ireland, Sweden and the UK are the only four countries that allowed NMS workers to move relatively freely across national boundaries upon accession.¹ Based on the data available one year after the eastward expansion of the EU, Boeri and Brücker (2005) suggest that the immigration restrictions imposed by the majority of the EU-15 resulted in the diversion of NMS migrants from the traditional destination countries that border the NMS, that is Austria, Germany and Italy, to the EU-15 countries with more liberal immigration policies. The data available to date reinforce that conclusion.

¹ Limits on free labour mobility can be imposed for a maximum of 7 years and are to be reviewed 2 and 5 years after accession. Following the 2 year review Finland, Greece, Portugal and Spain removed all restrictions on NMS workers and 6 other EU-15 countries adopted more liberal policies.

Table 1 shows estimates of the change since EU enlargement to the end of the third quarter of 2006 in the number of NMS nationals or residents born in the NMS in Denmark, Ireland, Sweden and the UK, the four countries that adopted a relatively open door policy towards migrants. In the few years before accession the number of NMS nationals in these countries was broadly stable or rising relatively slowly, such that it might be reasonable to assume that the change in the NMS population in these countries since then provides an estimate of the effect of EU enlargement on net migration over this period, against a counterfactual of no enlargement. We note that these data are compiled from a variety of sources and involve a number of assumptions.²

The numbers in Table 1 suggest relatively little impact of EU enlargement on immigration into the two Scandinavian countries considered, certainly in comparison to the two English speaking countries shown.³ Ireland in particular has experienced a large change in the number of NMS nationals present of 1.5 per cent of the total population and assuming that these are all of working age of 2.2 per cent of the working age population. By far the most popular destination for NMS emigrants to the EU-15 seems to be the UK, but relative to population size the impact appears much smaller than for Ireland.

The UK has seen strong immigration since the end of the last decade, when the annual net migration flow to the UK rose from around 50 thousand per annum to 150 thousand per annum.⁴ The effect of EU enlargement was to bring immigration to the UK to new heights, particularly immigration for work reasons. Considering data on the various entry routes, Salt and Millar (2006) propose that it is likely that 2005 recorded the largest ever entry of foreign workers to the UK. Analysing data to 2000, Hatton (2005) suggests that the rise in UK immigration at the end of the last decade is related to the adoption of a relatively liberal immigration policy, while Mitchell and Pain (2003) suggest the increase in UK immigration can be explained by demographic developments and economic factors such as incomes differentials between the UK and elsewhere and a favourable labour market. In any case, it seems likely that the recent inflow of NMS nationals to both Ireland and the UK in large part reflects the liberal approach taken in these countries to immigration from the NMS. It is more

² For Ireland and the UK the total numbers are based on the Irish Quarterly National Household Survey and the UK Labour Force Survey data, the latter as reported in Blanchflower *et al.* (2007), which sample resident households at quarterly intervals. The distribution of the total across the NMS is derived from the distribution of Personal Public Service Numbers issued to NMS migrants in Ireland and applicants under the Worker Registration Scheme in the UK, both of which monitor immigration flows rather than the population of migrants at any particular point in time. Estimates for Sweden are based on the population statistics provided by the Swedish central statistical office, available to the end of 2005, adjusted by a scaling factor of 1.375 to reflect the magnitude of the change to 2006 quarter 3. Estimates for Denmark are based on the population statistics provided by the Danish central statistical office, available to 1 October 2006 for Poland and to 1 January 2006 for the other NMS. We assume that the percentage change in non-Polish NMS nationals residing in Denmark between January and October 2006 is similar to the percentage change in Polish nationals residing in Denmark over this period to arrive at the figures in Table 1.

³ Data that became available during the write up of this work suggests that the NMS born population resident in Sweden rose by 9 per cent between 2005 and 2006. In light of these data the change in the NMS population resident in Sweden following EU enlargement May 2004 is likely to be closer to 11 thousand rather than the 8 thousand shown in Table 1. This is still small in comparison to the equivalent numbers for Ireland and the UK.

⁴ Total International Migration statistics, National Statistics, UK.

Table 1: Change in NMS population resident in selected EU-15 countries following EU enlargement May 2004 (thousands)

| | Denmark | Ireland | Sweden | UK | Austria | Germany | Italy | Total emigrant population | % of total population | % of working age pop. |
|------------------------------------|----------------|----------------|---------------|-----------|----------------|----------------|--------------|----------------------------------|------------------------------|------------------------------|
| Czech Republic | 0.2 | 2.5 | 0.1 | 13.5 | 0.3 | 6.1 | 2.2 | 24.8 | 0.24 | 0.34 |
| Estonia | 0.2 | 1.1 | -0.1 | 3.0 | 0.0 | 0.8 | 0.3 | 5.2 | 0.39 | 0.57 |
| Hungary | 0.3 | 1.9 | -0.3 | 8.0 | 0.3 | 6.0 | 2.2 | 18.4 | 0.18 | 0.27 |
| Latvia | 0.3 | 4.8 | 0.3 | 15.7 | 0.0 | 1.4 | 0.5 | 23.1 | 1.01 | 1.46 |
| Lithuania | 1.0 | 9.6 | 1.3 | 29.7 | 0.1 | 2.0 | 0.8 | 44.5 | 1.30 | 1.91 |
| Poland | 3.2 | 37.9 | 6.3 | 167.5 | 6.0 | 62.0 | 30.9 | 313.8 | 0.82 | 1.19 |
| Slovakia | 0.1 | 5.1 | 0.2 | 27.3 | 1.6 | 3.2 | 1.2 | 38.8 | 0.72 | 1.00 |
| Slovenia | 0.0 | 0.0 | 0.1 | 0.3 | 1.1 | 1.2 | 0.4 | 3.1 | 0.16 | 0.22 |
| Total NMS | 5.4 | 62.8 | 8.0 | 265.0 | 9.3 | 82.7 | 38.5 | 471.7 | | |
| % of total population | 0.10 | 1.49 | 0.09 | 0.45 | 0.11 | 0.10 | 0.07 | | | |
| % of working age population | 0.15 | 2.17 | 0.14 | 0.72 | 0.16 | 0.15 | 0.10 | | | |

Source: Authors' calculations based on the Irish Quarterly National Household Survey, the UK Labour Force Survey data as reported in Blanchflower *et al.* (2007), Irish Personal Public Service Number data, the UK Worker Registration Scheme, population statistics from the Swedish and Danish central statistical offices, Austrian Labour Market Service data and data from the Austrian Federal Ministry for Economic Affairs and Labour reported in Biffi (2007) Tables 2 and 3, population statistics produced by the Italian National Statistics Institute, OECD International Migration Outlook 2006, foreign population statistics from the Federal Statistical Office Germany, and NiGEM database. Calculations are described in the text and in footnotes to the text.

difficult to explain the apparent differences in NMS migration to the English speaking countries vis-à-vis the Scandinavian countries that also operated a relatively open door policy following EU enlargement. Economic factors are likely to help explain the relative popularity of Ireland and the UK amongst NMS emigrants, but it is questionable whether these alone can explain the patterns observed. In 2004 unemployment in Ireland and the UK measured just under 5 per cent. In Denmark and Sweden unemployment was not very different at a little over 6 per cent. The language may be another factor contributing to the popularity of the English speaking countries. We also note that immigration legislation in Denmark was more restrictive than in Sweden, Ireland and the UK, with work permits for NMS nationals being issued only for a maximum of a year (Boeri and Brücker, 2005).

The data shown in Table 1 illustrate the change in the stock of NMS migrants resident in a number of EU-15 countries that is likely to have been associated with EU enlargement. This is different from the flow of NMS migrants into these countries associated with EU enlargement. Data on the numbers involved in migration flows tend to be much larger than data on the migrant population at a particular point in time, because many people who enter a country also leave again, sometimes quite quickly. This is important to point out, because the macroeconomic effects of migration are likely to depend also on the size of the migration flow relative to the stock, as we discuss in the sections below. In Ireland, 299 thousand Personal Public Service Numbers were allocated between May 2004 and November 2006 to NMS nationals. This compares to an estimate of the total number of NMS nationals resident in Ireland in the third quarter of 2006 of 96 thousand from the Irish Quarterly National Household Survey. In the UK the Worker Registration Scheme suggests that 510 thousand NMS nationals had come to work as employees in the UK between May 2004 and September 2006. The UK Labour Force Survey suggests that in the third quarter of 2006 there were 265 thousand NMS nationals resident in the UK who had arrived since accession (Blanchflower *et al.*, 2007). Issues of differential coverage mean that the migration stock estimates provided by the Survey data and the immigration flow estimates provided by the registration data are not directly comparable. Nevertheless the differences in magnitude between the stock and flow data suggest that NMS migration to Ireland and the UK has been very much of a temporary nature, with relatively short stays before return.

Data for the three countries that might have received the majority of NMS migrants had labour been allowed to move freely across the EU-15 is more scant, but it is possible to draw a number of conclusions on the basis of the available data. It seems likely that these countries experienced only a modest increase in migration flows from the NMS as a result of EU enlargement. Data from the Austrian Federal Ministry for Economic Affairs and Labour reproduced in Biffi (2007) Table 2 suggest that NMS migrants registered to work as employees in Austria at a rate of just over 1200 per month on average for most of 2005. It would be difficult to attribute these flows to EU enlargement alone, since Austria already saw significant inflows from the NMS in advance of accession. But, it seems quite likely that the numbers of NMS workers in Austria has increased more rapidly since then. From Poland alone, the number of wage and salary earners entering the Austrian Labour Force rose from 3328 in 2003 to 4309 between January and mid November 2005. In addition, Austrian Labour Market Service data, reported in Biffi (2007) Table 3, show a near doubling of the number of self-employed NMS workers in Austria between 2003 and 2005, reflecting a four fold

rise in the number of self-employed Polish nationals and a 43 per cent rise in the number of self-employed Hungarian nationals. We have taken these figures to imply an increase of 0.16 per cent in the population of working age in Austria due to increased migration from the NMS, as shown in Table 1.⁵

Italy experienced a near doubling of nationals from the NMS between January 2003 and January 2006. Over this period the number of NMS nationals in Italy rose from 42.2 thousand to 80.7 thousand according to the population statistics produced by the Italian National Statistics Institute. We assume that this increase can be attributed to EU enlargement.⁶ However, we note the general increase in foreign nationals residing in Italy over this period, which could be interpreted to suggest that the increase in the NMS population in Italy has occurred independently of EU enlargement. According to population statistics the foreign population in Italy rose from 1.3mn to 2.4mn from January 2003 to January 2006. The number of migrants from Albania and Romania increased by 334.7 thousand over this period, dwarfing the increase in NMS migrants.

Germany has traditionally been a popular destination for Polish emigrants. The number of Polish nationals residing in Germany averaged 318 thousand in the years 2001 to 2003.⁷ In 2004 the number of Polish nationals in Germany fell back by 35 thousand and it is possible to speculate that Polish emigrants substituted other destination countries for Germany with the new possibilities that arose upon accession to the EU (Fihel, 2006). In 2005 the Polish population in Germany returned to its pre-accession level in 2003. Data from the Federal Statistical Office Germany suggest that the foreign population fell from 7,342 thousand at the end of 2003 to 7288 thousand at the end of 2004, remaining virtually unchanged in 2005. It is difficult to discern from these data any impact of EU enlargement. For the purposes of the exercise in this paper we assume that net migration to Germany from the NMS increased by an amount proportionally similar to that calculated for Italy and Austria.

Summing across the EU-15 countries listed in Table 1, it appears that the largest migrations from the NMS, in comparison to the population of the sending country, have occurred from Latvia, Lithuania, Poland, and Slovakia (consistent with the findings of Fihel *et al.*, 2006). According to our calculations, assuming that recent NMS migrants are predominantly of working age as seems to be the case, 1.9 per cent of the Lithuanian population of working age and 1.2 per cent of the Polish population of working age were residing in the EU-15 at the end of 2006 due to enlargement. The magnitude of these shocks is not necessarily reflected in the population statistics of the NMS; for example, according to these the population of Poland declined by 0.04 per cent between 2004 and 2005.⁸ Population numbers are of course influenced by many factors. One such factor may be increased immigration to some NMS from less affluent Eastern European countries, a process which has been underway throughout

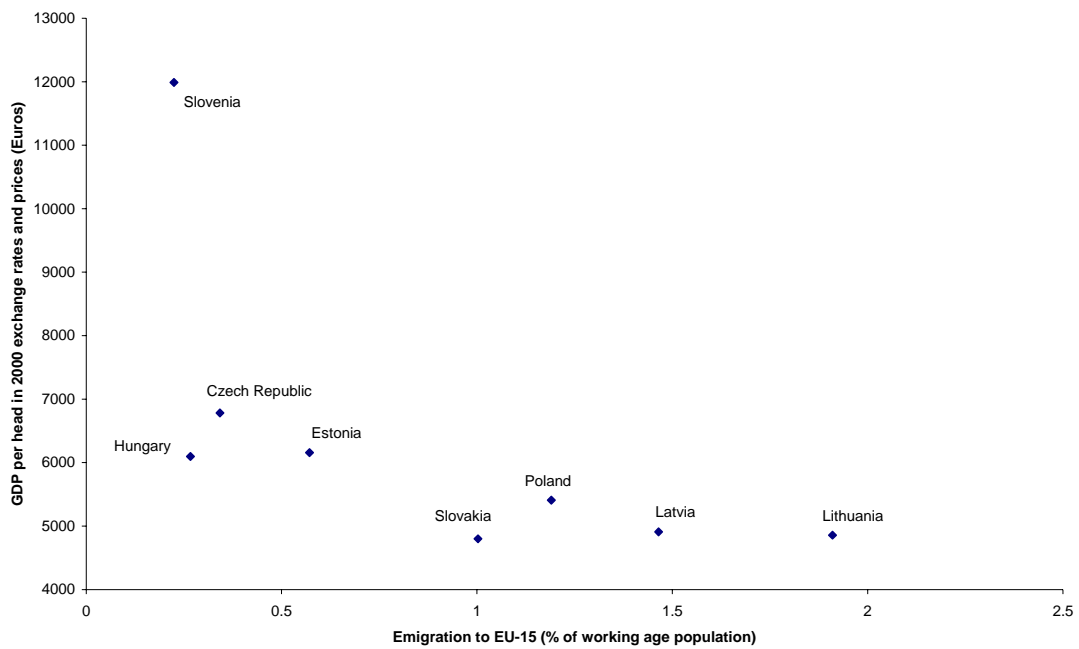
⁵ We assume that the increase in the average monthly inflow of wage and salary earners from the individual NMS countries since accession is due to EU enlargement and that by the end of 2006 half of this additional flow had returned to their home country, not unlike the stock-flow pattern implied by the data for Ireland and the UK. Adding to this the increase in the stock of self-employed NMS nationals in Austria we arrive at the figures in Table 1.

⁶ Four out of five of the additional NMS population were from Poland. We assume that the increase in the non-Polish NMS population is distributed between the non-Polish NMS countries according to population size.

⁷ OECD, *International Migration Outlook*, 2006.

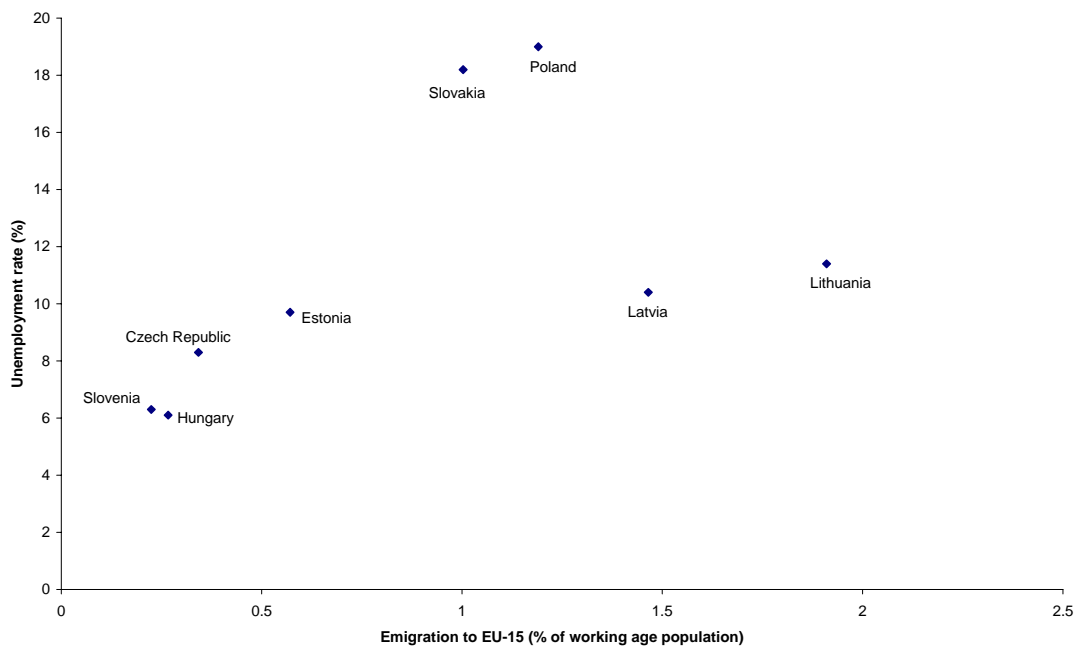
⁸ Eurostat.

Figure 1: NMS net emigration and GDP per head (2004)



Source: Net emigration as shown in Table 1; GDP per head from NiGEM database.

Figure 2: NMS net emigration and unemployment (2004)



Source: Net emigration as shown in Table 1; Unemployment rate from NiGEM database.

the 1990s (Fihel *et al.*, 2006). However, the discrepancy between the population statistics and the estimates in Table 1 may in part be the result of the temporary nature of migration, which could have led to a situation where people leaving the NMS register for work in the EU-15 without giving up residency in their home country. Again, a comparison of the stock data to the flow numbers available is suggestive of

sizeable churn. Estimates of the number of Polish nationals leaving Poland for the EU since accession range from 500-600 thousand (Centre for Migration Studies, Poland) to 1 million (Ministry of Labour, Poland). This compares to our estimate of the change in the stock of Polish nationals resident in the EU of a little more than 300 thousand.

Figures 1 and 2 plot net immigration from the individual NMS countries to the EU-15, measured as a percentage of the population of working age and as shown in Table 1, against GDP per capita and unemployment. These illustrate the correlation between emigration size and economic conditions in the source country. Figure 1 shows a negative correlation between emigration and GDP per capita. Figure 2 shows a positive correlation between emigration and the unemployment rate in the source country.⁹ Perhaps unsurprisingly, the largest migrations seem to have occurred from the poorest economies of the NMS. These countries also tend to have higher unemployment rates. While the emigration from the NMS that is likely to be associated with EU enlargement is significant from the poorer NMS, the numbers reported in Table 1 are not indicative of any mass migration from east to west. We note that the migration flow numbers associated with EU enlargement are likely to be substantially larger than the effects shown in Table 1.

An illustration of macroeconomic impacts

Here we illustrate the potential implications for output and inflation, unemployment, productivity, the current account balance, and GDP per capita of the migration described in Table 1 in the previous section. We analyse the impacts of migration using NiGEM as in, for example, Barrell *et al.* (2006). NiGEM is a large estimated quarterly model of the world economy, which uses a 'New-Keynesian' framework in that agents are assumed to be forward-looking but nominal rigidities slow the process of adjustment to the long-run equilibrium. Most countries in the OECD are modelled separately. The rest of the world is modelled through regional blocks: Latin America, Africa, East Asia, Developing Europe, OPEC and a Miscellaneous group mainly in West Asia. All models contain the determinants of domestic demand, export and import volumes, prices, current accounts and net assets, and models of the OECD countries are more complex than those of the non-OECD countries. Domestic demand, aggregate supply, and the external sector are linked through the wage-price system, income and wealth, the financial sector, the government sector, and competitiveness. The external sector links the domestic economy to the rest of the world.

For the purposes here a brief mention of the supply side is in order. For a full description of NiGEM see Al-Eyd *et al.* (2006). In the long term output is determined by a CES production function with labour augmenting technical progress, and long run labour and capital demands are consistent with the production function. The labour market embodies an equilibrium level of employment. We assume that employers have the right to manage, and hence the bargain in the labour market is over the real wage. Real wages, therefore, depend on the level of trend labour

⁹ Blanchflower *et al.* (2007) show correlations between NMS migration flows to the UK (measured as a percentage of NMS source country populations) and a range of 'well-being' indicators in NMS source countries, including the unemployment rate, the employment rate and GDP per head.

productivity as well as the rate of unemployment. Wage equations are designed to be consistent with the production function, and include both forward and backward looking elements. The labour force is assumed to grow in line with the population of working age and any exogenous changes in the participation rate.

We assume that EU enlargement changes the total population and the population of working age from 2004 quarter 2. We assume that the migrant stock takes 10 quarters to reach the levels reported in Table 1 for 2006 quarter 3. Thereafter we assume that the number of migrants remains constant. This is merely a working assumption. Clearly, we might expect to see further changes when all EU-15 countries open their labour markets, a process that has already begun.¹⁰ It is also possible that migration to the English speaking countries continues to rise. Our assumptions also imply that the migrant population does not necessarily grow in line with the rest of the host country population, which may be a reasonable assumption given the transitory nature of migration. Also, population projections for the majority of Central and Eastern European countries are flat, such that our assumptions imply a constant emigrant stock in proportion of the sending countries. The change in the population is implemented exogenously, thus we do not consider any feedback from the macroeconomic implications of migration to the size or direction of migration.

We assume that migrants and the native populations in the receiving countries are equally productive and perfect substitutes, and that their productivity rises at the same rate over time. We assume that upon remigration to the home country individuals have the same productivity as natives there. An alternative interpretation of this assumption is that there is no remigration. We relax these assumptions in the section below. NiGEM is used with all its defaults in place, including forward looking financial markets. Results are shown for individual years 2005-9 and 2015 in Tables 2-7. The impacts of the population changes from EU enlargement are also illustrated in Figure 3 for Lithuania and Poland and for Ireland and the UK. Note that these are not intended to illustrate the possible effects of EU enlargement per se, but rather the possible effects of the migration from the NMS to the EU-15 associated with EU enlargement.

Conditional on the assumptions described above, the effect of a net increase in Polish emigration of around $\frac{1}{3}$ million people of working age is to reduce output in Poland permanently by around 1 per cent. The reduction in output comes as a result of having fewer workers, but the reduction is not one for one. This is due to our assumption that the capital stock does not fully adjust, leaving the capital-labour ratio permanently higher. In the longer term, business sector capital adjusts downward to match the decline in the labour force. However, public infrastructures (such as transport) and the housing stock are assumed not to adjust fully over the time period shown. Both public and housing capital enter the production function and, since these do not adjust fully, productivity in Poland is permanently higher by around $\frac{1}{3}$ per cent. Qualitatively the effects on output and productivity are similar for the other NMS countries. In Ireland and the UK the reverse pattern is observed. The increase in the labour force raises potential output, and in the longer term output rises to match this increase. As in the case of Poland, described above, the match is not one for one, since productivity changes. In Ireland and the UK productivity falls as public sector infrastructure and

¹⁰ See footnote 1.

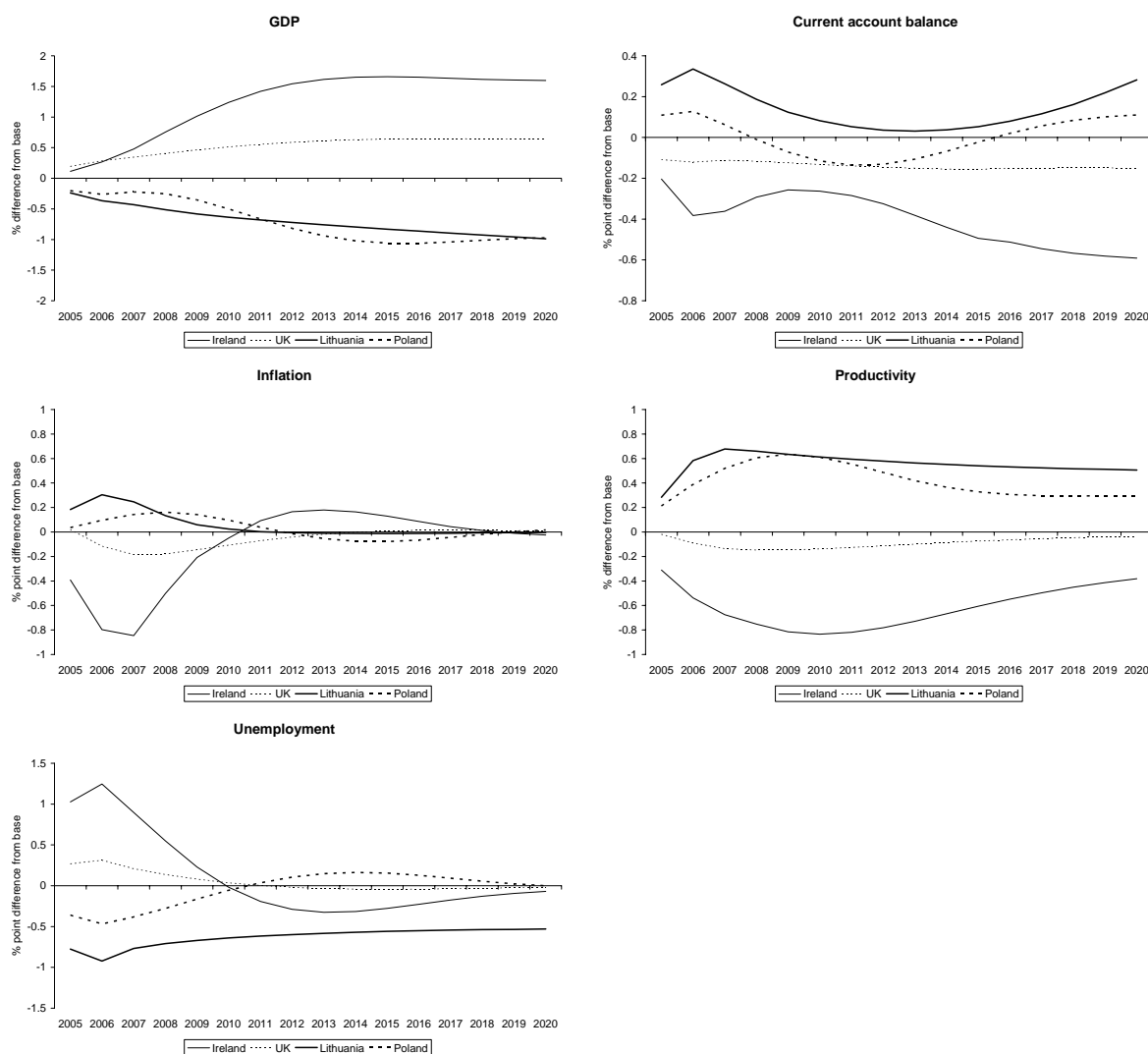
the housing stock are assumed not to adjust fully, failing to rise to maintain the ratio of capital to labour. Intuitively this assumption seems more restrictive for the receiving countries than for the sending countries, for which it seems reasonable to assume that emigration would not lead to an immediate dismantling of public infrastructure. For the receiving countries it might seem more likely that public sector capital would adjust to reflect the increased population.¹¹ If this were the case the effects on GDP would be larger in the EU-15 countries than our simulations suggest, and productivity would be less depressed. In the longer term our calculations imply that output in the UK is $\frac{2}{3}$ per cent higher than it would otherwise be. In Ireland output is higher by 1.7 per cent reflecting mainly the bigger size of the migration shock.¹²

Our results also suggest that there is an effect in the short run on unemployment and inflation. This is because labour market equilibrium changes in the short run, due to adjustment costs and the assumption that migration is initially unanticipated. The latter seems the appropriate assumption for Ireland and the UK where changes in immigration from the NMS have been much larger than anticipated in advance of EU enlargement. In the receiving countries the assumption that the shock to migration is unanticipated means that the capital stock that is required for these additional workers is not in place when they arrive. Hence, labour demand is unchanged at given wages. As a consequence, new migrants either displace existing workers or become unemployed. Higher unemployment reduces negotiated wages and therefore the average wage level as compared to where it would otherwise have been. In turn, this allows the amount of labour demanded and the level of employment to rise (the labour supply curve moves down the labour demand curve). This effect on unemployment in the receiving countries is temporary, and eventually labour demand shifts upwards, as capital accumulates, and unemployment returns to its long run equilibrium rate. The process of adjustment also involves lower inflation in comparison to base. Lower wages dampen inflation temporarily and there will be a monetary response, reducing interest rates. Lower wages reflect lower productivity, which falls because, relative to capital, labour becomes more abundant and cheaper so that, for the same level of output, companies hire more and employment increases. As a result of higher levels of utilisation, the rate of return on existing capital rises. Because the rise in employment exceeds the initial decline in wages, household income and consumption rise. As consumption rises and the profitability of capital increases, companies also start building up the capital stock and stepping up their investment plans, but the capital stock increases initially at a lower rate than total output expands because investment plans take more time than consumption to adjust. The subsequent increase in the capital stock restores productivity to around its initial level or to a new steady state (as discussed above).

¹¹ The issue of public infrastructure and housing is important. While it can and will adjust in the receiving countries there are temporary, though possibly quite long lasting, effects on prices or shadow prices (for example, congestion). Duffy *et al.* (2005) find that high levels of immigration put upward pressure on house prices and rents reducing the benefits from coming to Ireland at the margin. It also has welfare implications for residents.

¹² We assume the shock is constant in absolute size after 2006 and hence represents a smaller per cent increase in the Irish workforce by 2015 than in 2006.

Figure 3: EU enlargement and migration



Notes: Values shown at year end. We do not include remittances in our balance of payments estimates.

The impact of the population changes we describe is to raise unemployment in Ireland by 1 percentage point on average between 2006 and 2008. In the UK unemployment rises by $\frac{1}{4}$ percentage point on average over this period. In both countries the rise in unemployment and resulting downward pressure on wages reduces inflation. In Ireland inflation is reduced by on average 0.7 percentage points between 2006 and 2008. In the UK the corresponding figure is less at around 0.1 to 0.2 percentage points. The impact comes through more quickly in Ireland, which may reflect more flexible markets there than in the UK. In Ireland the reduction in inflation has relatively less impact on interest rates than in the UK because the ECB targets Euro Area inflation, which falls less than that in Ireland. The short term pattern of higher unemployment and lower inflation in the EU-15 countries is mirrored by lower unemployment and higher inflation in the accession countries, in comparison to base.¹³ On average in the years 2006 to 2008, unemployment is reduced by 0.8

¹³ Fertig (2003) reaches a similar conclusion about the pattern of unemployment effects.

percentage points in Lithuania and by 0.4 percentage points in Poland. The downward shift in unemployment is permanent for Lithuania.¹⁴

The short term effects on unemployment from unanticipated migration in this analysis apparently contradict some studies of the relationship between migration, unemployment and wages (for a review see Blanchflower *et al.*, 2007). A recent study of the relationship between unemployment changes and the rise in NMS migration across UK local authority districts fails to find any relationship between the two (Gilpin *et al.*, 2006). This finding at the local level may be the result of induced onward migration. Hatton and Tani (2005) suggest that internal migration may be one of the mechanisms through which local area labour markets adjust to migration inflows. This would in any case explain some differences in the relationship between migration and unemployment at the local area level and the more aggregate level.¹⁵ An alternative explanation is that immigrants are imperfect substitutes for native workers (Manacorda *et al.*, 2006). If immigrant and native workers were complements, immigration might increase aggregate labour demand, also in the short run. Similarly, if immigrants' skills relieve bottlenecks in the labour market, the short term rise in unemployment that we find for the EU-15 may be less and the long-term equilibrium rate of unemployment may be reduced.

Indeed we note that the labour market assumptions on wage determination embodied in NiGEM may not be fully realistic for Ireland. The unemployment rate there has remained unchanged in the face of the very large migration flows. If the simulation results were taken at face value the Irish unemployment rate would have fallen below 3% in the absence of EU enlargement, something that has never been experienced in recent times and well below the experience of other seemingly fully employed economies. The fact that unemployment probably did not change much, while wages did, could be either because of exceptional labour market flexibility, or because the immigrants from the NMS just displaced immigrants from other locations, such that the immigration at an aggregate level was anticipated. The latter may well have been important for Ireland where the authorities changed policy on issuing work permits to people from non-EU countries as a result of the influx from the NMS. Immigration from outside the EU fell by a small amount after enlargement, though nothing like the increase in immigration from the NMS. Alternatively business may have anticipated that immigrants would have been found from somewhere and invested accordingly.

All the economies considered here can be regarded as small and open, and hence the change in the rate of return on capital that results from the change in the labour force will cause a capital inflow or outflow. This will continue until the rate of return comes back to world levels. For countries that are net recipients of migrants, the rise in the labour force for a given level of capital raises the return to capital. This causes capital to flow into the country and a balance of payments deficit finances the extra investment, which comes in advance of extra income. As illustrated in Figure 3 and in Table 5, the current account in Ireland and the UK deteriorates as a result of the migration inflow. The deterioration is more marked in Ireland not only because the

¹⁴ The downward shift in unemployment is also permanent for some of the other smaller and relatively less developed economies, i.e. Estonia, Latvia and Slovakia, as our model of their labour markets embeds a reservation wage which rises over time, but little endogenous productivity effect, and hence a rise in productivity raises employment.

¹⁵ Borjas (2003) makes a similar point.

**Table 2: EU enlargement and migration:
Impacts on GDP (% difference from base)**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2015 |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Denmark | 0.04 | 0.08 | 0.09 | 0.11 | 0.13 | 0.16 |
| Ireland | 0.09 | 0.21 | 0.39 | 0.65 | 0.92 | 1.66 |
| Sweden | 0.02 | 0.04 | 0.05 | 0.07 | 0.08 | 0.13 |
| UK | 0.16 | 0.26 | 0.32 | 0.38 | 0.44 | 0.64 |
| Austria | 0.03 | 0.05 | 0.07 | 0.08 | 0.10 | 0.17 |
| Germany | 0.02 | 0.03 | 0.03 | 0.05 | 0.06 | 0.14 |
| Italy | 0.03 | 0.05 | 0.05 | 0.06 | 0.07 | 0.09 |
| Czech Republic | -0.02 | -0.03 | -0.05 | -0.08 | -0.10 | -0.20 |
| Estonia | -0.03 | -0.08 | -0.13 | -0.16 | -0.18 | -0.25 |
| Hungary | 0.00 | -0.02 | -0.05 | -0.09 | -0.13 | -0.22 |
| Latvia | -0.12 | -0.23 | -0.34 | -0.46 | -0.54 | -0.62 |
| Lithuania | -0.19 | -0.33 | -0.41 | -0.48 | -0.56 | -0.82 |
| Poland | -0.16 | -0.25 | -0.24 | -0.23 | -0.31 | -1.05 |
| Slovakia | -0.05 | -0.13 | -0.22 | -0.29 | -0.32 | -0.38 |
| Slovenia | -0.01 | -0.01 | -0.02 | -0.03 | -0.03 | -0.04 |

**Table 3: EU enlargement and migration:
Impacts on inflation (% point difference from base)**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2015 |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Denmark | -0.02 | -0.03 | -0.04 | -0.03 | -0.02 | 0.00 |
| Ireland | -0.24 | -0.66 | -0.86 | -0.65 | -0.30 | 0.14 |
| Sweden | 0.01 | -0.02 | -0.05 | -0.07 | -0.05 | 0.01 |
| UK | 0.07 | -0.07 | -0.16 | -0.19 | -0.16 | 0.01 |
| Austria | -0.02 | -0.04 | -0.05 | -0.05 | -0.04 | 0.01 |
| Germany | -0.01 | -0.03 | -0.05 | -0.05 | -0.05 | 0.01 |
| Italy | -0.01 | -0.01 | -0.02 | -0.02 | -0.02 | 0.01 |
| Czech Republic | 0.01 | 0.02 | 0.02 | 0.01 | 0.00 | -0.01 |
| Estonia | 0.02 | 0.08 | 0.08 | 0.04 | 0.01 | 0.00 |
| Hungary | 0.00 | 0.02 | 0.03 | 0.01 | 0.00 | -0.01 |
| Latvia | 0.08 | 0.23 | 0.28 | 0.18 | 0.08 | 0.02 |
| Lithuania | 0.11 | 0.26 | 0.29 | 0.17 | 0.08 | -0.01 |
| Poland | 0.02 | 0.07 | 0.13 | 0.16 | 0.15 | -0.08 |
| Slovakia | 0.05 | 0.13 | 0.13 | 0.05 | 0.01 | 0.00 |
| Slovenia | 0.00 | 0.02 | 0.02 | 0.00 | -0.01 | 0.01 |

**Table 4: EU enlargement and migration:
Impacts on unemployment (% point difference from base)**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2015 |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Denmark | 0.04 | 0.04 | 0.02 | 0.01 | 0.00 | 0.00 |
| Ireland | 0.84 | 1.24 | 1.03 | 0.68 | 0.35 | -0.29 |
| Sweden | 0.06 | 0.08 | 0.06 | 0.04 | 0.02 | -0.02 |
| UK | 0.23 | 0.32 | 0.24 | 0.16 | 0.10 | -0.04 |
| Austria | 0.04 | 0.06 | 0.03 | 0.01 | 0.00 | 0.00 |
| Germany | 0.04 | 0.05 | 0.03 | 0.01 | 0.00 | -0.01 |
| Italy | 0.03 | 0.04 | 0.03 | 0.02 | 0.01 | 0.00 |
| Czech Republic | -0.12 | -0.18 | -0.14 | -0.08 | -0.04 | 0.03 |
| Estonia | -0.21 | -0.29 | -0.25 | -0.21 | -0.20 | -0.18 |
| Hungary | -0.10 | -0.14 | -0.09 | -0.03 | 0.02 | 0.02 |
| Latvia | -0.50 | -0.74 | -0.63 | -0.53 | -0.48 | -0.47 |
| Lithuania | -0.65 | -0.94 | -0.81 | -0.73 | -0.68 | -0.56 |
| Poland | -0.29 | -0.45 | -0.41 | -0.32 | -0.21 | 0.16 |
| Slovakia | -0.34 | -0.49 | -0.41 | -0.35 | -0.33 | -0.30 |
| Slovenia | -0.08 | -0.12 | -0.11 | -0.10 | -0.10 | -0.10 |

**Table 5: EU enlargement and migration:
Impacts on the current account (% point difference from base)**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2015 |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Denmark | -0.01 | 0.01 | 0.02 | 0.02 | 0.02 | -0.01 |
| Ireland | -0.14 | -0.32 | -0.38 | -0.31 | -0.27 | -0.47 |
| Sweden | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| UK | -0.12 | -0.12 | -0.11 | -0.11 | -0.12 | -0.16 |
| Austria | -0.02 | -0.03 | -0.02 | -0.01 | 0.00 | -0.01 |
| Germany | 0.01 | 0.00 | 0.00 | -0.01 | -0.02 | -0.05 |
| Italy | -0.01 | -0.01 | 0.00 | 0.00 | 0.01 | 0.01 |
| Czech Republic | 0.03 | 0.05 | 0.03 | 0.01 | 0.00 | 0.00 |
| Estonia | 0.08 | 0.12 | 0.11 | 0.09 | 0.07 | 0.01 |
| Hungary | 0.03 | 0.03 | 0.00 | -0.03 | -0.05 | -0.02 |
| Latvia | 0.20 | 0.41 | 0.49 | 0.42 | 0.30 | 0.09 |
| Lithuania | 0.21 | 0.32 | 0.29 | 0.21 | 0.15 | 0.05 |
| Poland | 0.09 | 0.13 | 0.09 | 0.02 | -0.05 | -0.04 |
| Slovakia | 0.11 | 0.20 | 0.22 | 0.18 | 0.14 | 0.04 |
| Slovenia | 0.02 | 0.04 | 0.04 | 0.04 | 0.03 | 0.02 |

**Table 6: EU enlargement and migration:
Impacts on productivity (% difference from base)**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2015 |
|-----------------------|-------|-------|-------|-------|-------|-------|
| Denmark | 0.00 | -0.02 | -0.04 | -0.03 | -0.02 | 0.01 |
| Ireland | -0.22 | -0.46 | -0.63 | -0.72 | -0.79 | -0.63 |
| Sweden | 0.01 | -0.01 | -0.02 | -0.03 | -0.03 | -0.02 |
| UK | 0.01 | -0.06 | -0.12 | -0.14 | -0.15 | -0.08 |
| Austria | -0.01 | -0.04 | -0.06 | -0.06 | -0.05 | 0.00 |
| Germany | -0.02 | -0.06 | -0.09 | -0.09 | -0.09 | -0.02 |
| Italy | 0.00 | 0.00 | -0.01 | -0.02 | -0.02 | -0.01 |
| Czech Republic | 0.04 | 0.09 | 0.14 | 0.18 | 0.20 | 0.18 |
| Estonia | 0.07 | 0.15 | 0.20 | 0.19 | 0.19 | 0.17 |
| Hungary | 0.04 | 0.08 | 0.12 | 0.14 | 0.15 | 0.08 |
| Latvia | 0.15 | 0.36 | 0.48 | 0.46 | 0.44 | 0.45 |
| Lithuania | 0.18 | 0.46 | 0.66 | 0.67 | 0.64 | 0.54 |
| Poland | 0.16 | 0.33 | 0.47 | 0.58 | 0.63 | 0.34 |
| Slovakia | 0.11 | 0.24 | 0.32 | 0.32 | 0.31 | 0.30 |
| Slovenia | 0.03 | 0.07 | 0.09 | 0.09 | 0.09 | 0.09 |

**Table 7: EU enlargement and migration:
Impacts on GDP per capita (% difference from base)**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2015 |
|-----------------------|-------|-------|-------|-------|-------|-------|
| Denmark | -0.01 | -0.02 | -0.01 | 0.01 | 0.03 | 0.07 |
| Ireland | -0.73 | -1.15 | -1.06 | -0.78 | -0.50 | 0.33 |
| Sweden | -0.03 | -0.05 | -0.04 | -0.02 | 0.00 | 0.05 |
| UK | -0.08 | -0.15 | -0.11 | -0.05 | 0.01 | 0.22 |
| Austria | -0.03 | -0.05 | -0.05 | -0.03 | -0.01 | 0.06 |
| Germany | -0.04 | -0.07 | -0.07 | -0.05 | -0.04 | 0.04 |
| Italy | -0.01 | -0.02 | -0.01 | -0.01 | 0.00 | 0.03 |
| Czech Republic | 0.12 | 0.19 | 0.19 | 0.17 | 0.14 | 0.05 |
| Estonia | 0.18 | 0.28 | 0.27 | 0.23 | 0.21 | 0.15 |
| Hungary | 0.10 | 0.15 | 0.13 | 0.10 | 0.05 | -0.03 |
| Latvia | 0.43 | 0.71 | 0.68 | 0.56 | 0.49 | 0.44 |
| Lithuania | 0.53 | 0.88 | 0.91 | 0.83 | 0.77 | 0.54 |
| Poland | 0.28 | 0.51 | 0.58 | 0.58 | 0.51 | -0.22 |
| Slovakia | 0.34 | 0.53 | 0.50 | 0.43 | 0.40 | 0.34 |
| Slovenia | 0.08 | 0.14 | 0.14 | 0.13 | 0.13 | 0.12 |

shock is bigger, but because the Irish economy is more open than the UK economy. The NMS countries see an improvement in the current account.

Table 7 illustrates the impacts of the migration flows from EU enlargement for GDP per capita. Following a small reduction in GDP per capita in the short term in the EU-15 receiving countries, GDP per capita rises in the longer term.¹⁶ The reduction in the short term comes about as it takes some time for the capital stock to adjust to the inflow of labour and for the additional labour to be absorbed into employment. In the longer term GDP per capita rises as the population of working age increases relative to the population as a whole. In the NMS GDP per capita generally rises relative to base. The reduction in the population of working age relative to the population as a whole will tend to depress GDP per capita, but the rise in productivity and the reduction in unemployment more than offset this change.

The differences in macroeconomic effects across countries reflect for the most part differences in the magnitude of the migration changes relative to the population of working age. But, there are other structural differences between economies that determine the profile of effects. We have already highlighted the importance of the composition of the capital stock. All else being equal, the larger the share of public sector and housing capital in the aggregate capital stock, the more pronounced the effect on productivity and the less pronounced the effect on GDP (remember these move in opposite directions). Also, the more capital intensive aggregate production is, the slower the economy will adjust to long run equilibrium. Other factors of importance include the openness of the economy, which is positively correlated with the magnitude of current balance effects, and the dynamics of the labour market. The effects of migration on unemployment will be more pronounced in countries with more sluggish labour markets and the effect on inflation will be less pronounced.

Migrant labour market characteristics, learning effects and remittances

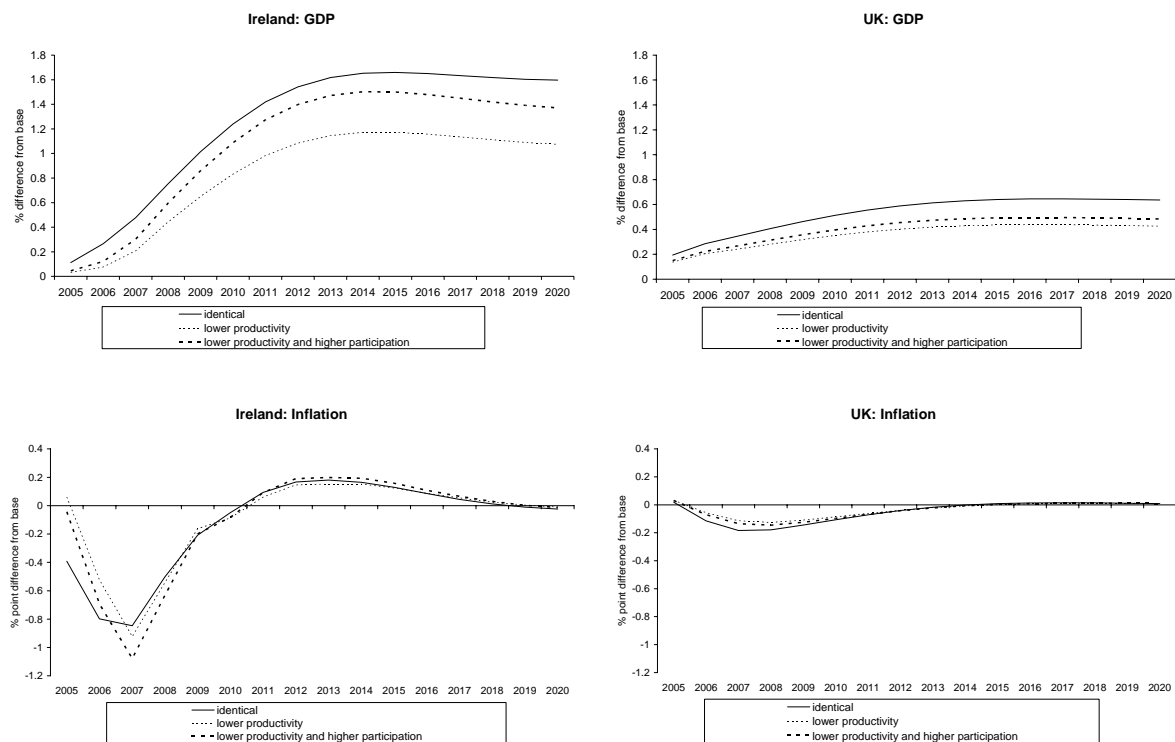
In the section above we assumed that all population groups in a particular country exhibit the same labour market characteristics. Here we relax these assumptions. First we consider the assumption that the average NMS immigrant is identical to the average worker in the EU-15, which is clearly rejected by the available data. As Borjas (1999) suggests, the impacts of migration on the labour market and the economy depend crucially on the skill mix of immigrants versus natives in the host country. Second, we consider the assumption that returning migrants are identical to native workers in the home country.

Dustman *et al.* (2005) suggest that the skill distribution for immigrants and natives in the UK are similar. However, their analysis does not extend to the period after EU enlargement and they do not look explicitly at recent NMS migrants. Comparing the occupational distribution of recent NMS migrants to recent migrants from elsewhere,

¹⁶ Simulating the macroeconomic implications of recent NMS migration to the UK using the IMF's Multimod, Iakova (2007) finds a similar profile over time for the effects on GDP per capita for different reasons than in the analysis here. There the short run reduction in GDP per capita is a result of productivity differentials between migrant workers (who are young) and the average native worker. This effect disappears over time as migrants grow older and their productivity increases.

migrants who arrived in the UK between 1998 and 2003, and the resident population, Riley and Weale (2006) find that recent NMS migrants are very much concentrated in low skill occupations, with 62 per cent of this group working in elementary or process, plant and machinery occupations in comparison to 19 per cent of the population as a whole. This does not necessarily imply that NMS migrants are low skilled. Indeed, Drinkwater *et al.* (2006) find that Polish workers who have arrived in the UK since enlargement achieve significantly lower returns to their education than other residents. A similar pattern may be observed in Ireland. The Irish Quarterly National Household Survey shows that NMS nationals in Ireland are much more likely to be employed in production industries (outside agriculture), hotels and restaurants and construction than other residents. These industries typically have a large share of low skilled jobs. Again it is likely that the jobs immigrants take are below their skill levels. The studies by Barrett *et al.* (2006) and Barrett and McCarthy (2006) suggest that migrants in Ireland (particularly from non-English speaking countries) tend to be employed in occupations that are not commensurate to their skill levels, achieving significantly lower returns to their qualifications. As Fihel *et al.* (2006) point out, it is possible that the tendency for NMS migrants to take up relatively low skilled jobs may be the result of the transitory nature of this migration.

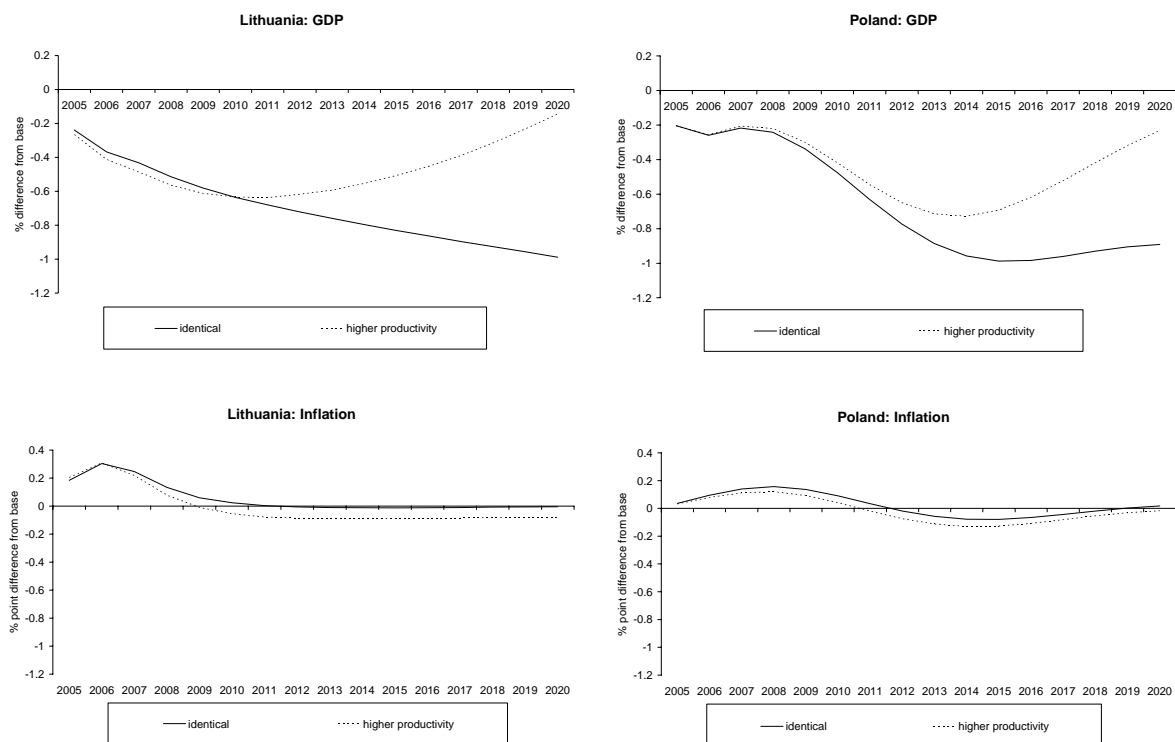
Figure 4: EU enlargement and migration: Impacts under different assumptions about immigrants versus natives



In Figure 4 we illustrate the sensitivity of the GDP and inflation impacts of migration in Ireland and the UK to the assumption about immigrant productivity relative to native productivity. We assume that the average NMS job is 74 per cent as productive as the average native job. This figure is calculated by comparing the employment weighted average of standard wage rates in three main occupation groups between NMS migrants and others using the UK Labour Force Survey, as reported in Riley

and Weale (2006). Note that we assume in this calculation that immigrants and natives are equally productive in the same job. If NMS workers are more productive than native workers in the same job, which may be the case since NMS workers in the same job are likely to be on average more highly skilled, our calculation may exaggerate the productivity differential. Our estimate of a 26 per cent productivity differential is within the range of figures provided by estimates of migrant pay penalties; for example, the pay penalty estimates for Polish workers in the UK in Drinkwater *et al.* (2006) and for non-English speaking migrants in Ireland in Barrett and McCarthy (2006). It is possible that the migrant pay penalty disappears over time as migrants adapt to the destination country and find jobs more commensurate to their skill levels or as migrants in temporary arrangements return to their home country. For simplicity we assume that all migration from the NMS is transitory and therefore that the pay penalty is constant over time. We also show the sensitivity of our results to the assumption about immigrants' labour market participation. The data suggest that NMS migrants are more likely to be in the labour force than others in Ireland and the UK, consistent with the notion that migration is for economic reasons. For the UK the difference in participation rates between NMS migrants and the remaining population of working age is estimated at 7 percentage points. For Ireland the differential would appear to be larger and we assume a differential of 15 percentage points there.

Figure 5: EU enlargement and migration: Impacts under different assumptions about returning emigrants versus natives



As illustrated in Figure 4 the differential productivity assumption means that the GDP effect of migration is lower in both Ireland and the UK. Because migration in this

instance raises capacity by less than if there were identical productivity, the dampening effect on inflation of migration is more subdued. The need for additional capital is also less, since the reduction in average productivity reduces the equilibrium ratio of capital to labour. The impact on the current account balance is therefore more muted. We also illustrate the effect of higher labour market participation amongst migrants. This basically amplifies the shock to the labour force for a given shock to the population of working age, and thus the magnitudes of the effects of migration on inflation, GDP, unemployment and the current account balance. Note that if wages exhibit less downward flexibility in low skill occupations, due for example to minimum wages, then we might expect the unemployment effects to be larger still (Riley and Weale, 2006).

Barrett and O'Connell (2001) and Co *et al.* (2000) find that the productivity of emigrants who return to their home country is above that of natives in the home country. For example, emigrants may have developed useful networks and language skills and learned new ways of working. In figure 5 we illustrate the GDP and inflation effects of the population changes in Table 1 in two NMS countries (Lithuania and Poland) when returnees are no different from natives (as in the previous section) and when returnees to the home country are 10 per cent more productive than natives. In this scenario we assume that the flow of returnees back to the home country is equal to the stock of emigrants per annum, consistent with the stock and flow figures observed for Poland, Ireland and the UK. In the case where returnees come back with enhanced productivity, the negative effect on GDP from the reduction in the labour force eventually reverses as the stock of more productive workers gradually builds up. The expansion of capacity in the longer term means that inflation is lower in comparison to the simple case where workers are identical.

We have as yet not discussed the effects of migrants' remittances to the home country. The simulations we have discussed so far assume that migrants' remittances to the home country are as native's remittances in the host country to the source country. Intuitively this assumption seems an unlikely description of reality. Fihel *et al.* (2006) suggest that remittances from NMS migrants are likely to be large, which would be consistent with the relatively transitory nature of NMS migration observed. Increased remittances payments from the EU-15 to NMS countries have obvious implications for the balance of payments. Remittances payments will increase household incomes in the NMS, but the effects on incomes in the EU-15 will be relatively small, since incomes are significantly higher there. The effect of higher incomes in the NMS will be reflected in higher GNP, rather than in higher GDP, and will tend to increase consumption in the NMS. The latter will tend to offset the downward effect on GDP in these countries in the short run, but should have no long run effect on GDP.

Conclusions

The immigration flows associated with EU enlargement are likely to be relatively small for most countries. Nevertheless, as illustrated here, there should be noticeable impacts in individual countries. Amongst the NMS the poorest and smallest economies appear to have experienced the largest population shocks. The concentration of recent NMS emigration in the English speaking economies suggests

that there are likely to be noticeable impacts there as well. However, in comparison to the immigration that normally occurs from countries outside the EU, the migration associated with the enlargement of the EU in May 2004 has so far proved modest. We have already noted that the UK and Italy experienced substantial increases in net immigration in recent years. Other EU countries, not considered here, have experienced similar sharp increases in migration flows in the recent past including Spain where the annual inflow of foreign nationals has steadily increased from 99 thousand in 1999 to 646 thousand in 2004.¹⁷ Interestingly, Spain, like the UK, has experienced a period of slow productivity growth, much as might be expected on the basis of the simulation analysis discussed in this paper.

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