

The influence of wage and unemployment differentials on labour mobility in the EU: A meta-analysis

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Abstract

This paper reviews the empirical literature on the impact of wage and unemployment differentials on the mobility of labour in the European Union. We calculated comparable elasticities for 26 empirical studies. The mean elasticity in the literature is quite small; around +0.4 for wage and -0.15 for unemployment differentials. A 1%-point rise in the host-country wage therefore raises the flow of in-migrants in that country by 0.4%. There exists substantial variation across studies, however. By performing a meta-analysis, the paper aims to explain this variation by the differences in characteristics of the underlying studies. Systematic differences are found with respect to the size of the regions and the specific country that is considered.

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1 Introduction

The extent of geographical labour mobility is a matter of key interest in the European Union. First, the upcoming EU enlargement will result in a strong increase in inequalities in the EU as a whole. These disparities may provoke flows of immigrants in the countries of the present EU. The actual size of these flows is the subject of a lively debate (see e.g. Straubhaar, 2001). A second reason for the European interest in labour mobility is its potential in helping regions adjust to asymmetric shocks. Since the introduction of a common currency in most countries of the European Union, monetary policies can not be used as a means of adjustment. Therefore the question whether labour mobility can act as a sufficient adjustment mechanism has received a lot of attention lately (see e.g. Puhani, 2001).

An assessment of the importance of both topics depends strongly on the actual impact of economic differentials on migration. Many economists have therefore sought to measure this. Bauer and Zimmermann (1998) provide a good narrative review of these studies. They conclude (p. 119) that "... International migration is not yet sufficiently analysed. There is a strong need for comparative research, either by testing similar hypotheses for various countries or by dealing with specific interrelationships within a group of countries." A narrative literature survey has clear limitations. One problem is that the underlying studies are difficult to compare because of different specifications, different data and different methodologies. This is especially so because there is no commonly agreed theory of labour mobility that yields a preferred specification. Therefore, studies use different ad-hoc specifications to estimate the elasticity. Second, the underlying studies report different types of elasticities. This makes a direct comparison virtually impossible.

These qualifications form the motivation for this paper. In particular, it tries to fill this gap by making the results of empirical studies comparable. It synthesizes the results and tests the importance of different ways to analyse labour mobility in primary research. In this way, it reviews the existing studies and guides the way forward. This meta-analysis is interesting for at least three reasons.² First, compared to an ordinary survey, an advantage of meta-analysis is that it more systematically compares the results of past studies. Second, using meta-analysis, one can assess the importance of particular choices by researchers for their quantitative results. A third contribution is that meta-analysis itself often yields interesting insights for policy makers.

The rest of this paper is organized as follows. We start in section 2 with a discussion of the relationship between economic incentives and labour mobility. Section 3 reviews the empirical literature and provides a summary table with the main characteristics of the 26 studies that form our meta sample. Section 4 presents the meta-analysis by means of a number of regressions. Finally, section 5 concludes.

² See Stanley (2001) for a more extensive discussion of the potential of meta-analysis in economics.

Geographical Labour Mobility: Theory

There are two main strands to the modern theoretical economic literature on geographic labour mobility, as revealed through migration patterns. The first approach models migration as a process driven by differences in expected earnings in different locations. The second views migration from a “human capital” perspective.

The Harris-Todaro Model

The first approach stems from Harris and Todaro (1970).³ Their original model concentrates on a developing country context in which there is rural to urban migration, but the basic approach can be applied to migration in general, both interregional and international. Expected earnings are defined as the product of the probability of securing employment (that is, the regional employment rate) and the prevailing regional real wage rate. Since there is assumed to be a degree of wage inflexibility, migration acts as an equilibrating mechanism across regions. Migration between two regions is driven by the wage or (un)employment differential between them. Workers migrate until differences in expected earnings are eliminated, as unemployment in higher wage regions increases, lowering the probability of finding a job. Therefore the theory predicts that lower amounts of immigration are associated with higher rates of unemployment or lower rates of real wages, and conversely that higher immigration is a product of lower rates of unemployment or higher real wages. The equilibrium prediction is that the same expected earnings, defined as above, prevail in each region, accompanied by zero migration.

The basic formulation might be criticised for a lack of realism in positing that in the long run incentives are equalised across regions. Equilibrium differences in incentives between regions can be accommodated by positing a “compensating equilibrium” in which, for example, better local amenities make up for a higher unemployment rate or lower real wage. Fundamentally, it is expected utility which is equalised across regions, so a broad range of additional factors can be incorporated. Various extensions to the model exist, which do not change the basic predictions regarding wages and unemployment. For example, many authors (such as Decressin (1994) and Bentivogli and Pagano (1999)) incorporate risk aversion, which provides one reason for entering unemployment and wages separately into migration equations, rather than collapsing them into a single expected income variable. Pissarides and McMaster (1990) and Decressin (1994) show that if agents are risk averse, migration flows are sensitive to the *aggregate* rate of unemployment. That is, at times of high national unemployment there is less migration, for given relative wage and unemployment rates. This is important since migration streams have been declining within Europe over the post-war period as a whole,

³ The approach has precursors in Smith (1776), Ravenstein (1889) and Hicks (1932). It differs from a pure neoclassical approach in allowing unemployment to exist in equilibrium, because of given political factors such as minimum wages, and in positing that migration depends on expected, as opposed to actual, earnings.

despite persistent and sometimes increasing regional disparities; one explanation may be increased unemployment (see Braunerhjelm et al. (2000)).

Other extensions to the Harris-Todaro model, which do not alter the basic predictions concerning wage and unemployment, are offered by Bhagwati and Srinivasan (1974), Cordon and Findlay (1975), Stiglitz (1974), Calvo (1978) and Schmidt et al. (1994).

The Human Capital Perspective

The second approach stems from Sjaastadt (1962). Here, the individual's expected utility calculation, implicit in Harris and Todaro (1970), is explicitly modelled. The migration decision is based upon a comparison of the net present value of expected future income streams in different locations, rather than simply the expected real wage. This naturally leads to a richer set of predictions concerning the constitution of the relevant incentives, based on the characteristics of individual potential migrants. For example, a person's age is of relevance since for a given expected wage, the future income stream increases with the agent's life expectancy. By extension, the age structure of the population should be a determinant of aggregate migration flows. Other variables such as education and training characteristics are held to determine individuals' employment prospects in various locations and their capacities to acquire and process the relevant information.

The human capital approach and Harris Todaro model share a focus on pecuniary incentives, and provide common predictions for effects of wage and unemployment differences on migration flows. It is not clear that there is any inconsistency between the two approaches; indeed, in their review of the migration literature, Ghatak et al. (1996) formulate a "Harris Todaro" model using a net present value calculation. Rather the human capital approach involves an explicit analysis of the determinants of an individual's expected utility from migration. The Harris and Todaro model simply assumes it is increasing in the expected wage. The human capital approach seems more informative for micro data studies of individual migration decisions (see below), but various inter-individual differences determining migration decisions might be expected to average out at the macro-level.⁴

Developments within the human capital approach include incorporation of the option value of waiting into the migration decision (Burda (1995)). This model shows that, given uncertainty about the relevant expected wage differentials, it may be in an individual's interests to delay migration pending improved information, even when there is an expected gain from migration. This provides an additional reason why migration flows may be low despite high spatial differentials.⁵

⁴ For a fuller overview of theoretical migration literature than offered here, see Bauer and Zimmerman (1995).

⁵ Though not an explanation why migration can fall over time with the same or increased differentials prevailing.

Other Approaches

In contrast to these approaches, models of *network* migration assume that the presence of migrants from a given nationality or ethnic group lowers the costs of migration for future potential migrants from the same group. These are dynamic models in which migration becomes path-dependent. Without some counteracting forces, the models will predict migration explosions involving the transmission of entire populations. Such factors include finite networks, falling relative wages in the destination region at higher levels of migration, and the changing characteristics of migrant communities over time.⁶ The network migration approach implies a smaller short run responsiveness of migration to wage and unemployment differentials relative to the neoclassical models discussed above, but greater long term responsiveness, since a change in these differentials at a point in time affects migration at all future times. See Hugo (1981), Massey (1990a and b), Massey and España (1987) and Bauer (1995).⁷

Another theoretical framework is that of the matching-function. In this approach, migration is seen as a special case of job-matching in which a job-seeker from one region is matched to a job in another region. Migration is thus a consequence of successful job search, rather than a precondition for it. The implications of unemployment for migration are therefore different than in the standard models of labour mobility.

Finally, some studies depart from the usual assumption that the individual is the unit of analysis, seeing families as the relevant decision making bodies. Mincer (1978) analysed labour force participation of women as a determinant of migration from this perspective, arguing that female paid employment has a negative effect on migration. This is because if family welfare is to be maximised, gains from one family member from migration need to be offset against losses accruing to others for a move to occur. On the other hand, there is also a positive effect via the (allegedly) unstabilising influence of female employment on marriage. That is, the more women work, the less prevalent secure marriage becomes as a living arrangement, which favours migration because independent decision makers are more mobile. Stark (1991) proposes that families can reduce income variability by having members work in different locations. In a similar vein, Daveri and Faini (1999) also adopt a familial perspective, according to which families have risk attitudes determining their migration behaviour. This results in sensitivity of the migration decision to the variance of income in different locations and their correlation with incomes in the origin region. In general, the family approach to migration does not alter the standard predictions concerning wage and unemployment differentials, but points to a broader range of determinants of migration. For example, migration between two countries might occur

⁶ Bauer and Zimmerman (1995) suggest that migrants will become a more representative sample of the sending region as the migrant stock increases, reducing the self-selective effect of migration. Another check might be the assimilation of the migrant stock into the host community, whereby it loses affinity with the sending community.

⁷ Stark (1991) also models asymmetric information as a determinant of migration.

in the absence of expected wage differentials, if their business cycles are negatively correlated, as a means of minimising risk to family income.

3 Geographical Labour Mobility: A review of empirical studies

This section presents a review of studies that empirically assess the influence of wage and unemployment differentials on labour mobility. The main purpose of this review section is to describe our data set and explore possible determinants of variations in elasticities between studies. This enables us to reflect on the kinds of differences there are between studies and which are likely to be important determinants of differences between regression results. The analytical comparison of studies is then undertaken by the meta-analysis in the following section.

We found 26 empirical studies which provide our data set. We selected any empirical study of migration in any EU countries, published or unpublished, containing a regression equation including wages and/or unemployment. If it was possible to calculate comparable elasticities (see next section) for either or both variables, these were calculated and included in the meta-regression. Whilst our primary focus is on Europe, if a study also looked at the USA, we included these elasticities for purposes of comparison. A brief overview of our sample is given in table 3.1 below which lists all studies used, indicating whether they look at net or gross migration, between or within countries and in which countries. In the remainder of this section we use the distinction between studies that analyse migration flows within countries and those that investigate international flows to divide them into two groups. We will discuss both in turn.

3.1 International migration

Country to country

Molle and van Mourik's (1988) study was the first to examine mobility in a European context, using data on stocks of foreign migrants resident in a selection of EU countries (see table 3.1 below). Surprisingly, it is the only study we found to examine trade as a determinant of migration between countries. In theory trade between countries could substitute for migration, and this is in line with the reported findings. In the final reported regressions, the unemployment rate was dropped because it yielded insignificant coefficients in most specifications.

Therefore we were, regrettably, unable to include this study in our meta-analysis. Recently we have obtained a slightly different publication (Molle and van Mourik, 1989), in which the regressions with unemployment are reported as well. We intend to use this to update our meta-analysis in the future.

Table 3.1 Summary of the studies included in the sample

| Id | Title | Net/Gross | Inter(natio)nal ^a | Countries | Period |
|----|------------------------------------|-----------------|------------------------------|----------------------------------------------------------------------------------------------|------------|
| 1 | Puhani (1999) | Net | Total (and internal) | WGermany, France, Italy | 1983-1995 |
| 2 | Gros and Hefeker (1998) | Net | Internal and International | Reunited Germany, Italy | 1993 |
| 3 | Bentivogli and Pagano (1999) | Net | Total | EU: European 11 versus USA | 1981-1994 |
| 4 | Neven and Gouyette (1994) | Gross | Internal | EU (EC as it was in 1985) | 1985 |
| 5 | Barro and Sala-i-Martin (1995) | Net | Total | WGermany, France, Italy, UK, Spain (also USA and Japan) | 1900-1988 |
| 6 | Pissarides and McMaster (1990) | Net | Internal | UK | 1963-1982 |
| 7 | Nahuis and Parikh (2001) | Net | Total | EU: current EU 15 | 1983-1995 |
| 8 | Alecke, Huber, and Untiedt (2000) | Net | Internal | Germany | 1990-1997 |
| | | Gross | International | Belgium, France, Germany, Netherlands and UK | 1984-1990 |
| 9 | Daveri and Faini (1999) | Gross | Internal | Italy | 1970-1989 |
| 10 | Orazio and Padoa Schioppa (1990) | Net and Gross | Internal | Italy | 1962-1986 |
| 11 | Eichengreen (1993) | Net | Internal | UK, Italy versus USA | 1962-1985 |
| 12 | Molle and van Mourik (1988) | Stock | International | WGermany, France, Netherlands, Belgium, Sweden, Austria and Switzerland | 1980 |
| 13 | Pissarides and Wadsworth (1989) | Gross | Internal | UK | 1976; 1983 |
| 14 | Bentolila and Dolado (1990) | Net | Internal | Spain | 1964-1986 |
| 15 | Decressin (1994) | Gross (and Net) | Internal | Western Germany | 1977-1988 |
| 16 | Chies (1994) | Gross | International | From Greece, Italy, Turkey and Spain to Germany and France | 1961-1990 |
| 17 | Lundborg (1991) | Gross | International | From Finland, Norway and Denmark to Sweden | 1968-1985 |
| 18 | Hatzius (1994) | Gross | Internal | UK | 1984-1991 |
| 19 | Waldorf, Esparza, and Huff (1990) | Gross | International | From Turkey to Western Germany | 1960-1986 |
| 20 | Antolin and Bover (1997) | Gross | Internal | Spain | 1987-1991 |
| 21 | Jackman and Savouri (1992) | Gross | Internal | UK | 1975-1989 |
| 22 | van-Wissen and Visser (1998) | Gross | International | EU 15 | 1991 |
| 23 | Van Leuvensteijn and Parikh (2001) | Gross | Internal | Germany | 1993-1995 |
| 24 | Van Leuvensteijn and Parikh (2002) | Gross | Internal | Germany | 1993-1995 |
| 25 | Büttner (1999) | Net | Internal | Western Germany | 1987-1994 |
| 26 | Fidrmuc (2002) | Net and Gross | Internal | Accession countries: Czech Rep., Slovakia, Poland, Hungary versus EU: Italy, Spain, Portugal | 1992-1998 |

^a Internal refers to migration within a country, international indicates migration between countries and total includes both migration streams.

Van Wissen and Visser (1991) use a kind of gravity model to analyse international migration flows within the EU 15 (plus Norway). They found an insignificant influence of both unemployment and wages. Their results imply that the size of the population in each country together with the migrant population are the most important determinants of migration. Strangely enough, they do find perverse effects for distance and language.

The importance of the size of the migrant population already present in the host country is also recognized by Waldorf, Esparza and Huff (1990). Furthermore, they provide the only study in our data set that was able to distinguish between labour- and non-labour-migration. Their analysis is restricted to one migration flow only, from Turkey to Western Germany. Besides evidence for network effects, they found a significant estimate for unemployment differentials. However the big influence of time trends in their results is, at least in our opinion, unsatisfactory.

Chies (1994) also considers migration from Turkey to Western Germany. In addition, she looks at inflows from some other countries in Germany and France. She estimates a simultaneous model for immigration, wages and unemployment. Her results with respect to unemployment and wages are diverse. A problem with her approach is that the model is not well specified and that the reported migration figures are higher than in other data sources.

Estimates of potential migration from the Central and Eastern European Countries to the present EU often focus exclusively on income differentials. Alecke et al. (2000) test this approach using data on the changes of stocks of foreign labour for a selected group of European countries. They conclude that differences in unemployment are more important than GDP levels and that receiving country fixed effects differ significantly from each other. A more elaborate model of the migration potential should therefore incorporate these elements.

International migration to regions

Mobility in the Nordic labour market is the topic of a paper of Lundborg (1991). He estimates two models to explain the differences in behaviour between Finnish, Danish and Norwegian migrants, distinguished by gender, to Swedish provinces. His estimates mostly conform to theory with respect to both wages and unemployment and do not systematically differ between the three countries considered. Lundborg also shows that benefits may play a role in explaining migration.

Daveri and Faini (1999) examine gross international emigration flows from regions of Southern Italy. They also look at domestic migration. We will discuss their results in the next part.

Gros and Hefeker (1998) also consider both external and internal immigration, using a simple regional regression analysis. They regress net external (foreign) immigration scaled by population on unemployment rates, for regions in Germany, for a single year, namely 1993. Wage rates are not included as an independent variable. Their main conclusion is that labour mobility is too low to serve as an adjustment mechanism.

Puhani (1999) also examines regional net immigration for German regions. However, he considers a longer time period. Moreover, he also performs regression analyses for Italy and France, in a panel study spanning 1983-1995. Separate panel models are estimated for data from each country, using the same regression specification. Independent variables are wage and unemployment differentials, and their first difference, finding a significant unemployment

effect, but no significant wage effect, in all cases. The results are used for a simulation exercise showing, in accordance with Gros and Hefeker (1998), pessimistic prospects for migration as an adjustment mechanism. Labour was found to be most mobile in West Germany. It is estimated, however, that at most 30% of an increase in unemployment in a West German region is absorbed by migration, 1.5 years after the shock, with corresponding estimates of 8% and 4% for France and Italy respectively. In Western Germany it takes more than 4 years for half the unemployed to migrate.

Nahuis and Parikh (2001) use the same data, but differ from Puhani in combining countries into a single panel, thereby constraining coefficients on independent variables to be equal across countries but allowing the intercept term to differ. In addition, the authors try to model the effects of network effects and female labour market participation in some specifications. In almost all regressions, unemployment and wage differentials are significant determinants of migration flows. Fixed effects models are found to out-perform the random effects estimator, which may reflect the diversity of European regions. The authors conclude that migration in Europe is an unlikely adjustment mechanism, but that the consequences are partly mitigated by female labour participation.

Barro and Sala-i-Martin (1995) perform regressions not only for European regions, but also for US states (and Japan). They have data covering a much longer time-span than the other studies in our sample: 10 yearly migration rates are used, covering 1900-1989 (US) and 1950-1989 (Europe). The authors find that migration is strongly related to GDP differentials in the US but the relationship is weaker in Europe, where the elasticity of migration with respect to regional GDP is uniformly lower than in the US and less precisely estimated. They do not consider the influence of unemployment differentials.

Bentivogli and Pagano (1999) also compare mobility in US states and European regions. Their sample of European regions is larger than for the previous study, including regions of all 11 countries using the Euro currency. Their study is also interesting in its consideration of risk aversion, which they incorporate into a model of migration. For Europe, but not the US, the risk factor was found to have a significant effect - that is, higher time variance of GDP per capita was associated with lower migration rates in Europe, but not in the US. Only wage effects were significant in the EU and these were orthodox. In the US both wages and unemployment bore significant regression coefficients, which were also orthodox. In the case of Europe - and in contrast to Nahuis and Parikh (2001) - they find that the Hausman test favours the random effects model, but they prefer the fixed effects model for the US.

3.2 Internal migration

Many studies consider interregional migration within a country. This is partly because data are easier available at the national level, but also because there are doubts about the comparability of data for different countries. A justification for using this approach for broader conclusions about the EU is often given by referring to the free movement of people in the European Union. Indeed, it is possible to consider international migration between EU member states as internal migration.

Many studies in our sample estimate migration determinants for the regions of one European country. Some of these studies use aggregate data, as do those already outlined, whilst others use micro data from surveys. This enables effects of inter-individual differences in, typically, age, education, housing and occupational characteristics to be estimated in addition to those of inter-regional economic disparities which are the typical focus of aggregate data studies. We will discuss both in turn.

Aggregate data

An influential study on interregional migration in Britain is provided by Pissarides and McMaster (1990). Their results suggest that wage and unemployment differentials provoke migration, as theory predicts. However, when the level of a region's relative wage is used instead of the change, there is no significant effect. Furthermore, their results imply an extremely slow adjustment to equilibrium through migration. Hence, there is important potential for regional policy to reduce the adjustment costs of unemployment, by transferring jobs to depressed areas.

Jackman and Savouri (1992) also look at interregional migration in the UK, but they use an entirely different theoretical framework, that of job-matching. They conclude that migration indeed can be modelled using a hiring function and that unemployment differentials have significant effects, consistent with their theoretical framework. An important result is that a high proportion of long-term unemployment diminishes out-migration. This implies that migration is low during a recession, because overall engagements then fall. The impact of wages has a perverse effect, which might be explained by compositional effects.

Eichengreen (1993) uses the same regression framework as Pissarides and McMaster (1990) for the UK, and extends it to Italy and the USA, so that he can systematically compare their results. Elasticities of migration with respect to wages and unemployment are higher for the US than those estimated for the U.K., while the Italian regressions deliver no significant coefficients apart from for migration in the previous period. Alternative wage data and model specifications for Italy do return significant coefficients, but again these are lower than those estimated for the US. The author goes on to estimate the relationship between regional and national-average unemployment rates for the same countries. He argues that despite lower labour mobility in the European cases, there is no evidence that deviations from the long term relationship between regional unemployment rates are more persistent in Europe. The author concludes that other

factors than labour mobility are at work in Europe to restore this equilibrium relationship, including wage adjustment, capital mobility and government policy.

The Italian case has attracted the attention of more economists. Orazio and Padoa Schioppa (1990) examine net migration into six regions of Italy. They estimate separate migration equations for each region. Their study also analyses gross flows, but we are unable to include these results, because the scaling of the variables seems different from what is implied in the text. For the influence of wage and unemployment variables on net flows, they obtain quite variate results, but always small.

Daveri and Faini (1999) examine gross emigration flows, both domestic and international, from regions of Southern Italy. In addition to regional wage and unemployment rates, they include risk factors. Wage effects were orthodox in both domestic and international regressions, but unemployment generally had an insignificant coefficient. For domestic migration, the more correlated are home and foreign incomes, the more migration occurred within Italy. Coefficients for internal migration were generally higher than those for migration abroad.

Gros and Hefeker (1998) used the same simple regional regression framework for the analysis of net external (foreign) and internal (domestic) immigration. For both Italy and Germany, for 1993, they found a significant effect of unemployment differentials.

Alecke et al. (2000) also look at German East-West migration. Both unemployment as per capita GDP differences show the expected signs. Furthermore, equality of both coefficients can't be rejected. Next to these differentials, there is an important role for fixed effects.

Decressin (1994) considers Western Germany. He presents a simple theoretical model to analyse gross migration between regions and concludes that wage and unemployment differentials show the expected signs. Furthermore, he argues that aggregate shocks have an important influence on gross flows, because not only unemployment differentials but also the level of unemployment has a significant impact. Migration might therefore work less well as an adjustment mechanism during recessions.

Büttner (1999) extends the analysis for West Germany to the small spatial level of districts. His results support a matching framework, since the regional vacancy rate significantly increases net immigration. Immigration from abroad also has strong effects on internal migration. With respect to the main variables of interest, the unemployment rate shows the expected sign and is highly significant, but the estimated wage rate is at odds with the theoretic predictions. Büttner suggests that some specific composition effect might explain this latter impact.

Van Leuvensteijn and Parikh (2001) study whether population migration data can be used to study labour mobility, as do most studies in our sample. By using both normalized population and labour migration data, they conclude that the discrepancy is not significant and that the results are similar. Only the magnitude of the housing variable seems to be affected. They therefore conclude that population migration may be used to examine labour migration issues and do so in a follow-up paper (Van Leuvensteijn and Parikh, 2002), which extends Decressin's

analysis to the whole of Germany. They conclude that unemployment and wage differences are important factors in determining migration. This conclusion is not affected by including infrastructure and housing variables, unlike in Decressin's study. The authors take this as evidence that economic variables are more relevant for migration between East and West German regions than within West Germany. An important contribution of their study is that they allow for a more complex wage-response. Their results suggest that the wage relationship is concave for blue-collar workers and convex for skilled labour. These results can be explained by option value theory of waiting, combined with risk aversion.

Internal migration in Spain is the topic of Bentolila and Dolado's (1990) paper. Based on a pooled regression of net migration flows into 17 Spanish regions they conclude that their regression fits the data well and produces the theoretically expected results with respect to wages and unemployment.

Fidrmuc (2002b)⁸ is the only author to provide a comparison between migration in countries planning to accede to the EU and that in current EU member states. His approach is to examine inflows, outflows and net inflows for each country, with four specifications, all of which are panel models. For both gross and net in-migration in the Accession countries the results are generally orthodox, though some perverse elasticities are reported. However, wages were found to have a positive effect on gross out-migration for all the Accession countries. These results are interpreted as reflecting the concentration of migrants amongst the highly skilled and highly paid. In comparison, the results for the European states are generally orthodox when significant, though many coefficients are insignificant. Fidrmuc concludes that migration is a less likely adjustment mechanism in Accession countries than in the EU, but even in the latter it is an inadequate one. He counsels caution over the Accession states' joining the Euro zone.

Neven and Gouyette (1994) report a cross-sectional analysis of gross inter-regional emigration flows within countries comprising the EU, for 1985. They use Eurostat's REGIO database, finding a significant negative coefficient for wages but no significant result for unemployment. They also include both country dummies and a "periphery index", the latter indicating a Southern European region. These indicate that migration is relatively pronounced in the UK and slight in Italy, and that less inter-country migration occurs from southern European regions. They conclude that low labour mobility contributes to a lack of adjustment in southern Europe.

⁸ This replaces Fidrmuc (2002a), which was used in an earlier version of this paper.

Micro data

Pissarides and Wadsworth (1989) analyse UK gross migration flows for 1976 and 1983 using micro data from the Labour Force Survey. They examine effects of local-national wage and unemployment differentials in the sending region, concentrating on the latter. Three unemployment effects are analysed. First, a dummy variable is included representing whether the head of household is unemployed. Second, the regional unemployment differential is included, and third, the unemployment differential is multiplied by the difference between the occupational wage and average unemployment benefits (both of which are expressed as a ratio to the average national wage). The third variable is intended to measure the cost of unemployment. Furthermore, a lot of other individual characteristics are included in the regressions, like wages, plus a vector of age, education and occupational variables. The results were that unemployment was associated with migration mainly through the first effect, with the unemployed being significantly more likely to migrate. Regional unemployment differentials had a weak independent effect. The coefficient on the cost of unemployment, when significant, exhibited the 'wrong' sign, suggesting that migration is less likely the more expensive it is to be unemployed. Differences in results between the 1983 and 1976 regressions are argued to reflect higher aggregate unemployment in the former period. Since the unemployed were more likely to migrate in the 1976 regression, the authors conclude that aggregate unemployment reduces the mobility of the unemployed. These results are in line with those of Decressin (1994).

Another study on the effects of individual characteristics on the migration decision within the UK was performed by Hatzius (1994). He uses a sample for eight succeeding years, from 1984 till 1991. This differs from the other studies using micro data, which only include data for a single year. In its approach, it's similar to Pissarides and Wadsworth (1989). The estimated unemployment results in his study are orthodox, but he finds perverse wage effects. He argues that this may be because regional cost-of-living indices are absent.

Finally, Antolin and Bover (1997) provide a micro-study for Spain. They show that personal characteristics are important for a person's decision to migrate. In addition, they consider the influence of regional economic variables. They distinguish between registered and unregistered unemployed and show that this distinction is highly relevant: Unregistered unemployed have a higher chance of migration, whereas registered employed have a lower chance. This may be due to benefits. However, a problem with their approach for the calculation of the unemployment effect is that they also distinguish between different classifications for the employed: for instance, they show that the likelihood of migrating is higher for employees in the public sector than in the private sector, which in turn is higher than for self-employed. An implication is that higher unregistered unemployment at the expense of the self-employed will raise migration, whereas it will lower migration if it is at the expense of employees in the public sector. Therefore, we decided not to include the unemployment effect of this study. We did, however, use their estimated wage effect, which had the orthodox sign.

4 Meta-analysis of the elasticities

Meta-analysis refers to the statistical analysis of results from individual studies. Next to summarizing results found by previous studies, it aims to add knowledge by relating the variation in estimates of elasticities to the underlying differences in study characteristics. In doing so, meta-analysis goes beyond an ordinary survey of the literature. Moreover, the statistical analysis forces one to be explicit in the selection process of the original studies. This is not to say that meta-analysis is without problems. Especially, sample selection and publication bias, heterogeneity, and dependence of observations may cause problems.

First of all, an important methodological problem of meta-analysis is the possibility of ‘publication bias’. This occurs if only statistically significant results with the ‘correct’ sign are being published. One reason might be that editors of journals prefer to publish these ‘correct’ results. In our sample, we include several unpublished studies. By including a ‘published/unpublished’-dummy in our meta-regression, we gain some insight in the importance of this aspect of publication bias. It should be noted, however, that some of these papers may be published in a journal in the future. This holds for instance for Puhani (1999, 2001), for which we used an unpublished version while we were working on this paper. Moreover, another aspect of publication bias is that researchers do not write up their perceived ‘unsatisfactory’ results. It is impossible to include these results in the meta-analysis.⁹

A closely related concept is sample selection bias (or ‘retrieval bias’). This occurs when only studies are collected that use the same theoretical perspective, or studies that are published in the same journal. This can be harmful when there is a systematic relationship between the characteristics of the sampling process and the significance of the effect size.

Heterogeneity is almost inherent to meta-analysis as studies differ in numerous dimensions. In our meta sample, the estimated elasticities are obtained from 26 different studies, each with its own characteristics. Indeed, the studies show considerable heterogeneity in terms of the type of migration, the distinction between net and gross flows, and in the countries considered. This heterogeneity renders a direct comparison of studies difficult. At the same time, however, the diversity in study characteristics makes it possible to examine their effect on the magnitude and significance of the elasticity.

Related to heterogeneity is the problem of dependence. Because multiple elasticities are used from each study, the observations in our meta sample are mutually dependent. For instance, we draw no less than 44 elasticities from the Fidrmuc (2002b) study. Bijmolt and Pieters (2001) show, however, that taking all elasticities from the underlying studies in a meta-analysis is preferable to representing each study by a single value only.¹⁰ Therefore, we use all elasticities in

⁹ Florax (2001) discusses techniques to identify and remedy this type of publication bias.

¹⁰ Bijmolt and Pieters (2001) also discuss different approaches to deal with multiple measurements and show that the optimal procedure explicitly deals with the nested error structure.

our meta sample. In the appendix, we also present the results when we restrict the set of elasticities to the 'original' ones, i.e. we drop all the results from mere robustness analysis, like the use of a more elaborate estimation technique.

Furthermore, the problem is not so much the number of estimates per study, but the number of results that were obtained using the same data set. In our case this seems particularly relevant for the Eurostat data, that are used by a number of the primary studies. We try to get some idea of the importance of dependence by including a dummy for the Eurostat data set in the meta-regression.

These problems of meta-analysis imply that the results should be interpreted with caution. However, these problems also apply to ordinary literature surveys. As illustrated before, meta-analysis may still yield additional insights as compared to surveys. Moreover, meta-analysis allows for statistical tests on the importance of these problems, for instance, as we do with the dummy for unpublished studies.

Literature surveys usually implicitly assign more value to one study over the other because quality typically differs among papers. In fact, this selection process might be seen as the main value added of the author of a literature review. Such a selection is also possible in meta-analysis. What is more, meta-analysis can assign explicit values to each of the primary studies. Hence, the reviewer is forced to be explicit on how he weights one study compared to the other. It is less straightforward, however, to find an objective measure for these weights. Therefore, researchers often assign an equal value to each of the underlying studies.¹¹ This is also done in this study.

4.1 Constructing a meta sample

The studies discussed above use different specifications, thus producing coefficients with different interpretations. Moreover, authors either do not report the corresponding elasticity values or adopt different definitions of elasticities. To make the outcomes of various studies comparable, we transformed the coefficients of each of the studies into a uniformly defined elasticity. This elasticity measures the responsiveness of immigration flows to a 1% change in the variable of interest in the host region or country.

The definition for the elasticity with respect to wages reads as:

$$\text{Elasticity} = \partial \ln(\text{Immigration Flow}) / \partial \ln(\text{Wage})$$

while the elasticity with respect to unemployment is defined as:

$$\text{Elasticity} = \partial \ln(\text{Immigration Flow}) / \partial \ln(\text{Unemployment})$$

¹¹ Natural candidates as weights are the standard error of the elasticity, the number of observations that are used to estimate the elasticity, or the journal impact factor.

These elasticities measure the impact on *gross immigration* with respect to a change in the economic situation in the *receiving* country. However, some studies report regressions for net flows, for emigration or with respect to the sending region. In these cases, we had to adjust the reported coefficient to get comparable results. When elasticities are reported for sending regions (emigration), as is done for instance by studies that use micro data, we adjusted the coefficient by putting a minus sign before the calculated elasticity. In our meta-regressions we include the distinction between emigration and immigration and try to assess whether they exhibit differences in their sensitiveness.

For net migration, the adjustment is a little more complex. Net migration can be close to, or even equal zero. In that case, the sensitiveness of the net flow can be extremely high or even undefined. To transform a marginal coefficient for net migration into a comparable elasticity, one should recognize that the net flow is in fact nothing else than the result of two gross flows in opposite directions, one inwards and one outwards. The extra net inflow of people into a region that experiences an economic boom, should therefore be calculated relative to the sum of both gross flows. Consider for example a region with 90 emigrants and 110 immigrants each year. The net inflow is thus 20. As a consequence of a wage explosion with 10%, the next year 120 immigrants flow in, while only 80 people leave. The net flow therefore increases with 100% to 40. However, relative to both gross flows, this only amounts to an increase of $20/(110+90) * 100\% = 10\%$. This is the result that we can compare with the responsiveness of gross flows, so in this case we would report an elasticity of 1.

A final remark is in order about the actual calculation of the elasticity. This is often not straightforward. Unless the regression model is specified in a double-log specification, we need additional information to calculate the comparable statistic. In these cases, we evaluated the elasticity at the mean. For example, if the dependent variable was not specified in a logarithmic format, we used the mean value of the dependent variable to transform the marginal coefficient into an elasticity. Only if we could obtain this information, we included an elasticity in our meta sample.

In this way we ended with a meta-sample of 207 elasticities with respect to wages and 194 with respect to unemployment. In the remainder of this section we will discuss both samples.

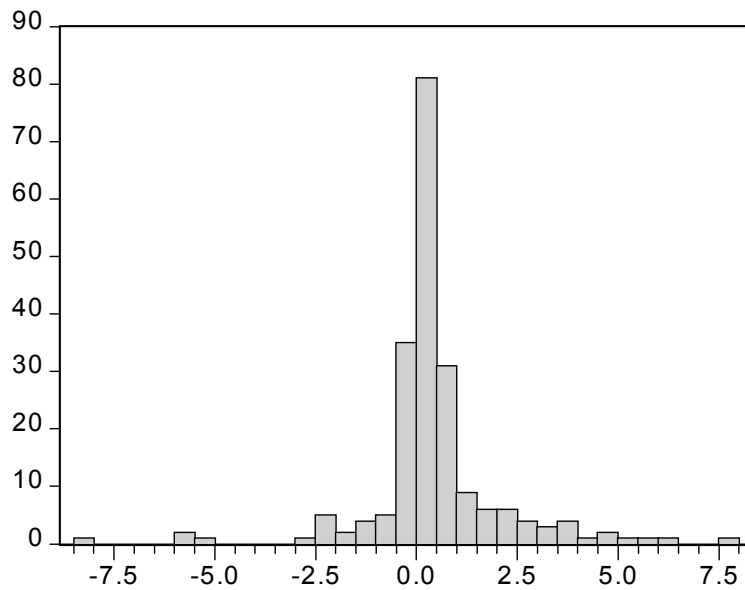
Elasticities with respect to wages

Table 4.1 lists the studies that we reported above and shows some characteristics of the wage-elasticities we obtained from them.

| Id | Title | Mean | Median | Max | Min. | Obs. |
|-----|------------------------------------|-------|--------|-------|-------|------|
| 1 | Puhani (1999) | 0.33 | 0.29 | 0.69 | 0.03 | 4 |
| 3 | Bentivogli and Pagano (1999) | 1.23 | 1.23 | 2.07 | 0.26 | 6 |
| 4 | Neven and Gouyette (1994) | 2.03 | 2.03 | 2.03 | 2.03 | 1 |
| 5 | Barro and Sala-i-Martin (1995) | 0.57 | 0.47 | 1.87 | 0.07 | 9 |
| 6 | Pissarides and McMaster (1990) | 1.32 | 1.32 | 1.98 | 0.65 | 2 |
| 7 | Nahuis and Parikh (2001) | 0.14 | 0.13 | 0.30 | -0.04 | 13 |
| 8 | Alecke, Huber, and Untiedt (2000) | 0.41 | 0.24 | 0.89 | -0.14 | 10 |
| 9 | Daveri and Faini (1999) | 0.71 | 0.65 | 1.41 | 0.04 | 11 |
| 10 | Orazio and Padoa Schioppa (1990) | 0.10 | 0.06 | 0.58 | -0.29 | 12 |
| 11 | Eichengreen (1993) | 1.15 | 0.57 | 2.43 | 0.34 | 5 |
| 13 | Pissarides and Wadsworth (1989) | 3.52 | 3.74 | 4.06 | 2.75 | 3 |
| 14 | Bentolila and Dolado (1990) | 0.32 | 0.35 | 1.18 | -0.38 | 21 |
| 15 | Decressin (1994) | 1.23 | 1.40 | 1.41 | 0.89 | 3 |
| 17 | Lundborg (1991) | 1.63 | 2.25 | 6.15 | -8.08 | 24 |
| 18 | Hatzius (1994) | -4.16 | -4.19 | -2.45 | -5.79 | 4 |
| 20 | Antolin and Bover (1997) | -2.39 | -2.39 | -2.36 | -2.42 | 2 |
| 21 | Jackman and Savouri (1992) | -0.50 | -0.49 | -0.36 | -0.60 | 5 |
| 22 | van-Wissen and Visser (1998) | 0.17 | 0.17 | 0.17 | 0.17 | 1 |
| 23 | Van Leuvensteijn and Parikh (2001) | 0.44 | 0.45 | 0.62 | 0.25 | 4 |
| 24 | Van Leuvensteijn and Parikh (2002) | 0.38 | 0.41 | 0.66 | -0.36 | 10 |
| 25 | Büttner (1999) | -0.75 | -0.31 | -0.14 | -1.63 | 13 |
| 26 | Fidrmuc (2002) | 0.40 | 0.09 | 7.73 | -2.45 | 44 |
| All | | 0.43 | 0.27 | 7.73 | -8.08 | 207 |

The table reveals a great variation among the studies. First of all, the number of elasticities derived from each study differs: it ranges from 1 to no less than 44 for the Fidrmuc-study. Secondly, there is great variation in the value of the elasticity. The majority of the elasticities shows the expected sign, but several studies report unorthodox findings. The calculated elasticities range from -8 to +8 with a mean of +0.43. The distribution of the entire meta-sample is depicted in figure 4.1 (next page).

Figure 4.1 Distribution of wage elasticities



From the distribution we note that most of the elasticities with respect to wages are quite small. More than half of the sample is between -0.5 and +1.0. On the negative side, there are a few exceptionally high results, whereas the development is more smooth on the positive side. In the meta-regressions, we use the whole sample.

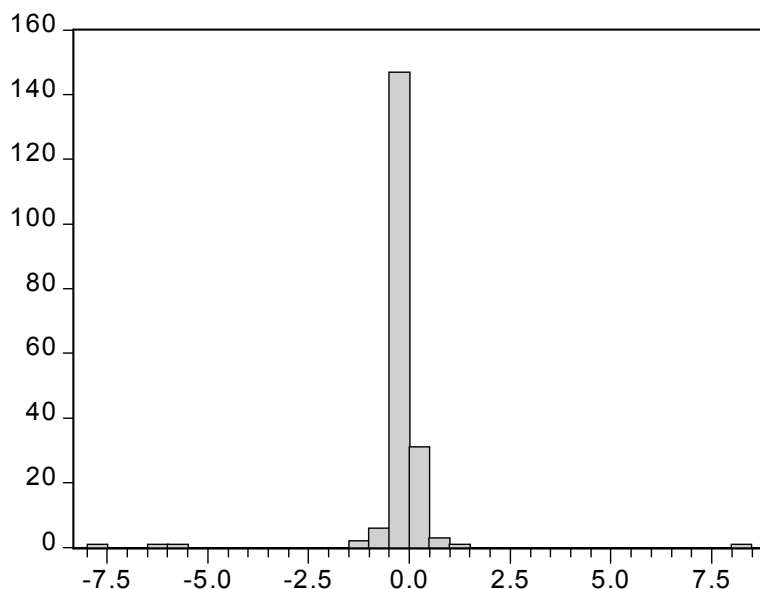
Elasticities with respect to unemployment

Table 4.2 (next page) shows the summary statistics for the sample of unemployment-elasticities. This table also shows a lot of variation among the studies. Almost half of the studies reports at least one elasticity with the 'wrong' sign. The range for the unemployment-elasticities is about the same as for the wage-elasticities, from -8 to +8. The mean value of -0.15 is however negative, as expected. The median is still smaller in an absolute sense. The distribution of the entire meta-sample is depicted in figure 4.2.

Table 4.2 Summary statistics for unemployment elasticities in our sample

| Id | Title | Mean | Median | Max | Min. | Obs. |
|-----|------------------------------------|-------|--------|-------|-------|------|
| 1 | Puhani (1999) | -0.16 | -0.17 | -0.10 | -0.21 | 4 |
| 2 | Gros and Hefeker (1998) | -0.18 | -0.20 | -0.13 | -0.22 | 3 |
| 3 | Bentivogli and Pagano (1999) | -0.22 | -0.06 | 0.14 | -0.72 | 6 |
| 4 | Neven and Gouyette (1994) | -0.22 | -0.22 | -0.22 | -0.22 | 1 |
| 6 | Pissarides and McMaster (1990) | -0.15 | -0.15 | -0.15 | -0.15 | 1 |
| 7 | Nahuis and Parikh (2001) | -0.20 | -0.16 | -0.08 | -0.34 | 13 |
| 8 | Alecke, Huber, and Untiedt (2000) | -0.04 | -0.04 | 0.03 | -0.12 | 10 |
| 9 | Daveri and Faini (1999) | -0.03 | -0.03 | 0.09 | -0.12 | 11 |
| 10 | Orazio and Padoa Schioppa (1990) | -0.03 | -0.02 | 0.00 | -0.09 | 12 |
| 11 | Eichengreen (1993) | -0.18 | -0.14 | -0.10 | -0.35 | 5 |
| 13 | Pissarides and Wadsworth (1989) | -5.92 | -5.92 | -5.70 | -6.13 | 2 |
| 14 | Bentolila and Dolado (1990) | -0.06 | -0.07 | 0.15 | -0.27 | 21 |
| 15 | Decressin (1994) | -0.48 | -0.63 | -0.13 | -0.68 | 3 |
| 17 | Lundborg (1991) | -0.03 | -0.11 | 0.83 | -0.57 | 18 |
| 18 | Hatzius (1994) | -0.40 | -0.40 | -0.39 | -0.41 | 2 |
| 19 | Waldorf, Esparza, and Huff (1990) | -1.33 | -1.33 | -1.31 | -1.35 | 2 |
| 21 | Jackman and Savouri (1992) | -0.19 | -0.21 | -0.03 | -0.23 | 8 |
| 22 | van-Wissen and Visser (1998) | 0.06 | 0.06 | 0.06 | 0.06 | 1 |
| 23 | Van Leuvensteijn and Parikh (2001) | 0.22 | -0.04 | 1.16 | -0.21 | 4 |
| 24 | Van Leuvensteijn and Parikh (2002) | 0.09 | 0.08 | 8.06 | -7.82 | 10 |
| 25 | Büttner (1999) | -0.15 | -0.16 | -0.09 | -0.21 | 13 |
| 26 | Fidrmuc (2002) | -0.03 | -0.06 | 0.75 | -0.33 | 44 |
| All | | -0.15 | -0.08 | 8.06 | -7.82 | 194 |

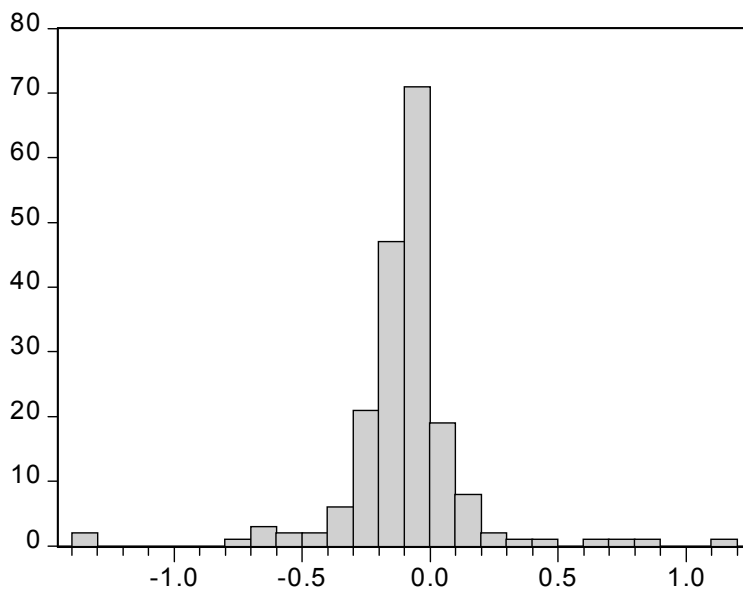
Figure 4.2 Distribution of unemployment elasticities



From figure 4.2 it is clear that most unemployment elasticities are clustered around zero. However, four extreme outliers obscure the picture. These elasticities could have a disproportionate effect on the outcomes of the meta-regressions. Therefore we decided to eliminate these values. As a result, the mean drops to -0.09. The median is of course unaffected by this.

The resulting sample is shown in figure 4.3. Most elasticities show the expected negative sign, but that they are generally very small. It should be noted, however, that the elasticities show the effect of a 1% increase in the unemployment rate (e.g. from 6% to 6.06%). This is of course much smaller than the effect of a 1%-point increase.

Figure 4.3 Distribution of unemployment elasticities without outliers



4.2 Meta-regressions of the elasticities

We now present the meta-regressions. That is, we estimate $y = \beta X + \epsilon$, where y represents the vector of elasticities (with respect to wages resp. unemployment) and X is a matrix of dummy variables that reflect various study characteristics. The parameter β thus measures the impact of each of the study characteristics (relative to some benchmark) on the elasticities. In the regressions, we focus on a selection of study characteristics. Among them, we see the distinction between net and gross migration, internal versus international migration, the regional size and the specific country under consideration. To make the results for wages and unemployment comparable, we decided to use the same set of variables in both regressions.

The regression results for the main variables of interest are presented in table 4.3. The coefficients in the table show the estimated differential impact of a particular study

characteristic, relative to some benchmark. For example, a value of 0.52 in the wage-column for the characteristic *Internal* indicates that the estimated wage-elasticity for internal migration is 0.52 higher than for international migration.

The appendix presents the results for a smaller set of elasticities, namely without the primary results from mere robustness analysis. These results are similar to the ones reported here and therefore don't need any further discussion.

Table 4.3 Meta regressions

| Variable | Regressions for Wage elasticities | | | Regressions for Unemployment elasticities | | |
|--------------------------|-----------------------------------|------------------------------|----|-------------------------------------------|------------------------------|----|
| | Coefficient | Standard Errors ^a | | Coefficient | Standard Errors ^a | |
| Constant | 1.63 | 0.36 | ** | 0.13 | 0.08 | |
| Countries | -2.15 | 0.53 | ** | -0.58 | 0.19 | ** |
| NUTS1 regions | -1.08 | 0.38 | ** | 0.03 | 0.05 | |
| Internal | 0.52 | 0.34 | | -0.12 | 0.07 | * |
| Gross flows | 0.34 | 0.24 | | 0.02 | 0.04 | |
| UK | 2.33 | 0.66 | ** | 0.30 | 0.09 | ** |
| Spain | -1.42 | 0.41 | ** | 0.14 | 0.06 | ** |
| Italy | -0.69 | 0.34 | ** | 0.16 | 0.05 | ** |
| Access Countries | -1.12 | 0.30 | ** | 0.04 | 0.05 | |
| Omitted var unemp / wage | 0.54 | 0.47 | | -0.48 | 0.11 | ** |
| Labour data | -3.05 | 0.52 | ** | -0.29 | 0.09 | ** |
| Panel | -0.33 | 0.24 | | -0.19 | 0.04 | ** |
| Unpublished | -1.20 | 0.36 | ** | -0.16 | 0.09 | * |
| Average year | 0.05 | 0.03 | * | 0.02 | 0.01 | ** |
| R2 | 0.26 | | | 0.36 | | |
| Observations | 207 | | | 190 | | |

A * indicates significance at the 10% confidence level; ** at the 5% level.

^a White Heteroskedasticity-Consistent Standard Errors.

We will discuss the results for each of the main variables of interest below.

Regional size

Different studies measure migration rates between regions of different sizes. In general, the smaller the regional size, the smaller the average distance will be between regions, since a study using a smaller regional size will measure migration within regions used by other studies. Hence we might expect that studies using smaller region sizes return higher estimates of wage and unemployment elasticities than studies using larger areas, since the costs of relocation are on average smaller. Furthermore, it may also be the case that potential migrants are more informed about differentials in their immediate vicinity. By including dummy-variable for

countries and for large regions (operationalised as Nuts 1¹²) in the meta regression, we tried to estimate the effect of the regional size used on the resulting elasticity. From the results in table 4.3 we see that the elasticity with respect to wages is indeed smaller in large regions than in smaller ones. The estimated coefficient, -2.15 for countries and -1.1 for NUTS 1 regions, are both significant at the 5% level. Turning to the regressions for unemployment elasticities, we would expect a positive coefficient for larger regions, because the average unemployment elasticity is negative. However, for unemployment elasticities the country effect is also negative and significant. This is unexpected, because it implies a more negative, and thus more sensitive, unemployment elasticity for countries as compared to smaller regions.

Migration characteristics

Studies differ in the type of migration considered. Among the distinctions, two stand out: internal versus international migration and net flows versus gross flows. We would expect internal migration to be more sensitive to economic differentials than international migration. It turns out that the meta-regression results do support this claim as far as the sign of the estimated coefficient is concerned, but only the effect on unemployment-elasticities is significant (at the 10% level). Turning to other migration characteristics, we don't find any evidence of differences in sensitiveness: the elasticity with respect to gross flows is not significantly different from net flows.

Country

We also considered the influence of the country that was studied. As is clear from the review section, four countries are especially popular in the primary migration studies. These are the UK, Spain, Italy and (Western) Germany. The estimated coefficients for Germany were not significant in any regression, so we left them out in the reported results. The meta-regression results further show that migration flows in the two South European countries, Spain and Italy, are clearly less sensitive to wage and unemployment differentials than in other countries. The results for the UK are ambiguous: migration in the UK seems more responsive to wage differentials and less to unemployment. Furthermore, we are especially interested to see whether the elasticities for the accession countries would differ from elasticities for other countries. Although Fidrmuc (2002) provides the only study in our sample that analyses these countries, the meta-regressions have a value-added in that they control for other characteristics of the specific case analysed, like internal migration. We did not have an a priori expectation about the sign of this effect. The results in table 4.3 reveal that migration in the accession countries is less sensitive to economic differentials, although the estimated coefficient is only

¹² Nuts is an abbreviation of 'nomenclature des unités territoriales statistiques' and refers to the decomposition of the EU into smaller administrative units. Nuts 2 comprises for instance the German 'Regierungsbezirke' and the Dutch provinces.

significant for wages. Although we should be cautious in drawing firm conclusions about migration streams from the accession countries to the EU on the basis of this result, it does give an indication that the reaction to economic incentives is not stronger in the accession countries than in the present EU members.

Methodology

Different authors use different specifications, different data and different estimation methods. We considered whether these differences influence the results. We were especially concerned about studies that excluded either wages or unemployment as an explanatory variable. Because regions with high wages often have less unemployment, we felt that this could lead to a serious upward bias in the results. This feeling is partially substantiated by the regression results: primary studies that omitted one of these variables reported *ceteris paribus* stronger effects, although this is only significant for unemployment according to the meta-regression results.

Another topic of interest is whether population data lead to different results when compared to labour data. Leuvensteijn and Parikh (2001) studied this question and concluded that both methods produce similar results. However, the results from the meta-regressions suggest that there are substantial and highly significant differences between both methods. This topic therefore deserves some more research.

We also assessed whether the use of panel methods influenced the elasticities. According to the meta-regressions this didn't have a major impact on the wage-elasticities, but it did influence the unemployment elasticities significantly.

Miscellaneous

We also considered a number of other potentially interesting characteristics. A highly debated issue in meta-analysis is whether significant results get more easily published. We tried to gain some insight in this topic by including a dummy for unpublished studies. Unpublished studies indeed seem to report lower wage elasticities than published ones. However, the opposite holds true with respect to unemployment elasticities. It is not clear what drives these results and how we should interpret them.

A number of studies use data from Eurostat. It is possible that the results obtained with these data are significantly different from those obtained with other data sources. However, we did not find any effect in the meta-regressions. Therefore, we decided to leave this variable out the presented regression.

Finally, we considered the development of the elasticities over time. Our results suggest that migration has become more sensitive towards wages, but less responsive with respect to unemployment. Again, it is not clear what drives these results.

Conclusions

This paper finds a mean elasticity of migration flows with respect to wages of 0.43 and with respect to unemployment differentials of -0.15. There is substantial variation among studies, however, which can be partly explained by underlying study characteristics. For instance, we find that the elasticity differs among countries. Migration in Spain and Italy reacts for instance not as sharply to wage and unemployment differentials as migration in other European countries. Also the sensitiveness of migration in the accession countries seems a bit weaker than in the present EU. This might give some confidence in the estimates of migrants from those countries, because these are typically based on the European experiences in the past.

Another important conclusion is related to the methodology used in primary work. Evidence from the meta-regressions suggests that it matters a great deal when either unemployment or wage variables are omitted. Furthermore, the use of panel methods and the distinction between migration or population data seems crucial for the perceived results.

These conclusions are important for future empirical studies of the sensitiveness of labour mobility to economic variables, which need to make choices on these study characteristics. For it is clear that the last word has not yet been said about the influence of economic differences on labour mobility.

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Appendix: Regression robustness results

The table below shows the results when the sample is restricted to the main results from the papers, i.e. when robustness checks from the primary papers are deleted. As a result, the number of elasticities halves, to about one hundred elasticities for either wages or unemployment. However, the main results are not significantly changed. This gives some extra confidence in the presented results in the main text.

Table A.1 **Meta robustness regressions**

| Variable | Regressions for Wage elasticities | | | Regressions for Unemployment elasticities | | |
|--------------------------|-----------------------------------|------------------------------|----|-------------------------------------------|------------------------------|----|
| | Coefficient | Standard Errors ^a | | Coefficient | Standard Errors ^a | |
| Constant | 1.41 | 0.58 | ** | 0.24 | 0.11 | ** |
| Countries | -1.89 | 0.77 | ** | -0.66 | 0.18 | ** |
| NUTS1 regions | -1.05 | 0.40 | ** | 0.04 | 0.07 | |
| Internal | 0.62 | 0.34 | * | -0.18 | 0.11 | * |
| Gross flows | 0.22 | 0.32 | | 0.03 | 0.06 | |
| UK | 2.16 | 0.76 | ** | 0.33 | 0.09 | ** |
| Spain | -1.50 | 0.41 | ** | 0.16 | 0.12 | |
| Italy | -0.61 | 0.44 | * | 0.14 | 0.07 | ** |
| Access Countries | -1.25 | 0.34 | ** | 0.00 | 0.08 | |
| Omitted var unemp / wage | 0.67 | 0.38 | * | -0.50 | 0.10 | ** |
| Labour data | -2.67 | 0.67 | ** | -0.37 | 0.10 | ** |
| Panel | -0.17 | 0.31 | | -0.18 | 0.07 | ** |
| Unpublished | -1.14 | 0.44 | ** | -0.23 | 0.13 | * |
| Average year | 0.06 | 0.04 | * | 0.03 | 0.01 | ** |
| R2 | 0.19 | | | 0.45 | | |
| Observations | 104 | | | 98 | | |

A * indicates significance at the 10% confidence level; ** at the 5% level.

^a White Heteroskedasticity-Consistent Standard Errors.