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Rodríguez-Pose, Andrés; Ketterer, Tobias

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Do we follow the money? The drivers of migration across regions in the EU

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DO WE FOLLOW THE MONEY?
THE DRIVERS OF MIGRATION ACROSS REGIONS IN THE EU

by

Andrés Rodríguez-Pose[a]

and

Tobias Ketterer[b]

[a] Department of Geography and Environment
London School of Economics
Houghton St
London WC2A 2AE
and
IMDEA Social Sciences Institute
Madrid
E-mail: a.rodriguez-pose@lse.ac.uk

[a] Leverhulme Centre for Research on Globalisation and Economic Policy
University of Nottingham
University Park
Nottingham NG7 2RD
E-mail: lextk7@nottingham.ac.uk

DO WE FOLLOW THE MONEY? THE DRIVERS OF MIGRATION ACROSS REGIONS IN THE EU

Abstract

Most immigration theories tend to highlight that migration follows wealth and economic dynamism, but is this also the case across regions in Europe? The aim of the paper is to investigate whether migrants in Europe indeed follow the money and to contrast this with a variety of potential alternative explanations, including the presence of migrants from a similar origin. The analysis is based on panel data estimations including 133 European regions over a time period of 17 years. Different lag structures have been employed in order to distinguish between short- and long-run effects. The results cast some doubt about the prominence of pecuniary factors as a determinant of cross regional migration in Europe, with little evidence to support the idea that migration follows economic dynamism. Network effects, human capital related-, and 'territorially embedded' innovation enhancing regional characteristics, by contrast, seem to play a much stronger role than hitherto considered. The study also reveals important differences among EU countries in the factors which determine regional migration.

Keywords: Inter-regional migration, mobility, regional economic growth, social networks, regions, Europe

1. Introduction

How important are pecuniary incentives for migration? According to most migration theories, they are crucial. Early theories relied heavily on regional differences in income and living standards as the main motivation for migration, in general, and for rural-to-urban migration, in particular (Hicks, 1932; Sjaastadt, 1962; Todaro, 1968, 1969; Harris and Todaro, 1970). Since then, money and jobs have remained the magnets for migrants in migration theory (e.g. Bhagwati and Srinivasan 1974; Fields, 1979; Lundborg, 1991; Schmidt, Stilz and Zimmermann, 1994). Most traditional empirical studies on migration have thus tended to focus on differences in living standards and economic dynamism as the key factors behind geographical mobility (Greenwood, 1997; Haapanen, 2000; Puhani, 2001).

Interregional migration patterns within Europe in the last decades fly, however, in the face of these theories. Despite substantial and persistent regional disparities in wealth, unemployment rates, and economic performance (Puga, 2002) and, notwithstanding freedom of mobility across much of the EU, migration rates within the EU have remained relatively subdued (Décressin and Fatàs, 1995; Fatàs, 2000; Obstfeld and Peri, 2000; Puhani, 2001). According to Huber (2004: 619) "it takes several years or decades before regional unemployment disparities are evened by migration". So, if differences in wealth, wages, and employment levels are critical for migration, why has interregional mobility in the EU remained low for so long? Do migrants really follow the money as predicted by traditional theory? Or are other factors, such as the presence of social networks or place-based regional externalities, as important, if not more, in determining the decision by Europeans to migrate?

These are the questions that this paper aims to address. Using migration data for 133 European regions during the period 1990-2006, we examine the relevance of pecuniary factors in determining migration trends, by estimating static and dynamic panel data models with heteroscedasticity robust fixed effects estimators. The objective is to determine, first, the relevance of pecuniary motivations and, second, to evaluate whether regional wealth, economic dynamism, and job availability are more important than the presence of other migrants, social networks, or other additional regional characteristics in shaping migration flows across Europe's regions.

In order to achieve this aim the paper first briefly reviews the theoretical literature on the relationship between pecuniary rewards and migration before contrasting the potential strength of this relationship with that of other possible migration drivers (Section 2). Section 3 presents a discussion of the data, introduces the variables used in the model, via a descriptive analysis, and finally provides the empirical specification and justification of the econometric approach. The empirical results are presented and interpreted in Section 4. Section 5 concludes that cross-regional migration in the EU in recent years is more the result of past migration trends, human capital related and 'territorially-embedded' externalities than of simple differences in wealth across territories and that the factors behind regional migration in Europe vary significantly from country to country.

2. Theoretical considerations: money and other migration drivers

Since the early work of Hicks (1932), financial rewards to individual mobility have been regarded as the fundamental magnet for migrants. According to Hicks (1932: 76), "differences in net economic advantages, chiefly differences in wages, are the main causes of migration". Migrants would regard differences in wages and expected incomes across territories as an opportunity to improve personal wealth, welfare, and living standards

(Sjaastad, 1962). According to these theories, migrants move in expectation of a higher utility in the place of destination (Sjaastad, 1962; Greenwood, 1997), making differences in wages or other forms of incomes across territories the driving force behind regional migration. Consequently, the higher the differential of region-specific earning opportunities and the higher the probability of finding a job in the region of destination, the higher migration flows between home- and host-territory (Harris and Todaro, 1970).

The source of unequal earning opportunities across regions has traditionally been rooted in differences in input factor endowment levels (Lewis, 1954; Ranis and Fei, 1961; Öberg, 1997). In this neoclassical framework, geographical differences in demand and supply of labour trigger migration. Territories with an abundant labour supply, relative to capital, have low marginal returns to labour, whereas territories with relative scarce labour endowments are characterized by higher labour returns. The resulting differences in marginal products lead to different wage levels across territories and are therefore considered as the main stimulus behind labour, mobility. Under conditions of perfect competition, perfect labour- and capital mobility, classical migration theory predicts people to move from low- to high-labour-productivity regions, leading to an increase of migrants' utility due to higher expected net income levels in high-productivity areas (Borjas, 1989; Bauer and Zimmerman, 1997; Öberg, 1997). [1]

However, when assessing the potential of maximizing their lifetime earnings, would-be migrants have also been found to weight their future career benefits against the financial and psychological costs of leaving their place of origin (Lee, 1972; Tassinopoulos and

[1] Further assumptions of the neoclassical model are full employment, homogenous supply of labour, perfect information and transparency, and the absence of transportation costs (Sjaastad, 1962). Moreover, traditional migration theories also predict wage convergence between host and source regions which finally result in an equalization of real wages across all regions (Todaro, 1969).

Kristensen, 1998). This cost-benefit calculation involves aspects of investments in human capital. Given certain skill-related attributes, potential migrants choose to move to areas where they believe they can be most productive. However, before reaping the expected benefits, mostly in the form of higher wages, migrants have to make certain efforts. These efforts may include learning a new culture and language, the costs of adapting to new working systems, the psychological costs of leaving old social ties behind and forging new ones, but also a number of material costs in the form of travelling and maintenance costs when looking for a new job (Massey et al., 1993). Theory predicts that potential migrants are likely to factor in possible short- or medium-term losses, due to a lack of complete information or due to the assimilation to a new environment and labour market, in expectation of greater returns down the line (Borjas, Bronars, Trejo, 1992). When considering to move would-be migrants will estimate the benefits of earnings and employment opportunities both in the home and in the potential destination markets, "deduct the costs of making the move, and choose whichever option maximises the net present value of lifetime earnings" (Tassinopoulos and Kristensen, 1998: 8). This implies that regions offering the highest pecuniary and financial returns to migration remain those more attractive for potential migrants (Lee, 1972; Pekkala, 2002, 2003). Traditional migration theory thus "typically leads to the conclusion that people migrate "[…] from regions experiencing a downward economic trend to regions experiencing an economic expansion" (Hooghe et al., 2008: 478). These views have been frequently corroborated by empirical studies. Linking expected future earnings to economic dynamism Haapanen (2000), for instance, shows that internal migrants in Finland are more like to move to economic prospering regions and that the elasticity of the migration propensity to dynamic regions is over twice as large as that of peripheral regions.

Wage-based migration motives are complemented by financial incentives based on other forms of income, such as state transfers or other public amenities. High redistributional transfers may on the one hand, provide an insurance against the risk of income losses (e.g. due to unemployment) and on the other, increase the overall availability of public goods. Both aspects will increase the utility of (risk-averse) individuals. The consequences on aggregated migration flows are twofold. Whereas potential migrants may be attracted by higher social welfare spending in the host territories, individuals already benefiting from relatively high public social spending may be less willing to leave their places of origin (Boyd, 1989; Haapanen and Ritsilä, 2007). Day (1992), for example, shows that inter-provincial migration flows in Canada are significantly influenced by provincial government expenditure policies in unemployment insurance benefits and direct transfer payments to individuals. The magnitude and variability of future lifetime earnings is, however, also subject to a certain degree of uncertainty regarding institutional aspects in the new host area (Ghatak et al., 1996). Informational asymmetries regarding the disposability of public goods, health care, schooling, or the quality of life, as well as, uncertainties about employment opportunities and unobservable wages in more advanced regions, may prevent people from leaving economically less attractive regions. Informational asymmetries may also be strongly conditioned by 'distance' (Greenwood, 1975, 1997; Zimmermann, 2005). The larger the distance between home and host area, the greater the risks and costs of movement. Conversely, information about labour market conditions and social amenities is expected to increase the closer the potential destination (Zimmermann, 2005).

The motives to migrate by an individual are, however, not only influenced by the level of potential future earnings and public transfers, but also by a number of other factors. The probability of finding a job in the host region plays, for example, a crucial role. High unemployment rates, as well as high ratios of long-term unemployment, may both

discourage migration in-flows and simultaneously act as an important 'push-factor' for potential migrants (Todaro, 1969; Pissarides and McMaster, 1990; Jackman and Savouris, 1992). Migration can therefore be considered as an intrinsic part of the search for jobs (Gordon, 1985; Décressin, 1994; Huber, 2004). The likelihood of migrating and finding a job are highly conditioned by the level of education of the individual (Fields, 1975; Pekkala, 2003; Zimmermann, 2005). Regions possessing industries employing predominantly highly educated people should, therefore, attract more migrants relative to regions with prevailingly low-skilled labour. Burda and Wyplosz (1992), for instance, show, in the context of East-West European migration, that the most likely movers are the young and the highly-educated. Rodríguez-Pose and Viltata-Bufi (2005: 559) also find that economically more dynamic regions and "those with a stronger foothold in the knowledge economy" tend to have the greatest capacity to attract highly educated people. As a result, the decision to migrate seems to be affected by a combination of individual and regional characteristics stretching beyond the usual scope of traditional economic migration drivers.

Place-based regional conditions are other factors behind migration which are attracting greater interest recently. Favourable socio-economic features, for example, are likely to allow migrants a fast transition into jobs that best suit their abilities and to accelerate assimilation in a new structural and administrative system. Favourable human capital endowments and high regional development levels also increase the probability of individuals boosting their own productivity and wages through interaction with others in the region (Rudd, 2000; Rodríguez-Pose and Tselios, 2011). Individuals moving to highly-skilled and well-off regions will therefore benefit from knowledge-spillovers. The presence of large groups of poor and educationally disadvantaged individuals in a region, by contrast, will lower overall productivity and therefore also the region's attractiveness towards potential migrants (Di Addario and Patachini, 2008).

Other socio-economic features shaping regional migration flows are related to the structure and the demographic composition of the population. Age has a significant influence on migration decisions (Massey et al., 1993; Tassinopoulos and Kristensen, 1998). The propensity to migrate considerably decreases with age (Zimmermann, 2005). Hence regions with a relatively young population structure will have a higher out-flow of (young) people. In addition, tight conditions on local labour markets, especially for young people, could enhance migration (Cairns and Menz, 2007).

Past migration trends also play a central role in determining the appeal of any given territory for new migrants. The presence of migrants of a similar origin will not only determine the direction of migration flows, but also their persistence. Social network linkages stretching from home to host regions will considerably reduce the costs and risks of migrating for certain groups (Massey et al., 1998). The presence of groups from the same geographical origin in any given region will allow future members of those communities to gain easier access to jobs and reduce the costs of assimilation in new cultural or administrative structures (Massey et al., 1993). This may trigger path dependence, whereby current migration flows may be substantially influenced by the magnitude and direction of past migration movements, reflecting potential chain migration effects at the ethnic group, village, or even family level (Massey and Gracia, 1987; Bauer and Zimmermann, 1997; Shah and Menon, 1999). Group, family, and household ties may also make migration a collective decision. Collective decision-making by larger units of related people, rather than by isolated individuals, may serve as a means to pool resources and to ensure a higher overall expected income, lower risk, while contributing to loosen several (capital) constraints due to various market failures, albeit often at the expense of individual freedom of choice (Katz and Stark, 1988; Taylor, 1986; Stark, 1991). As a result, individual earning

opportunities may be affected by household externalities (Mincer, 1978; Rodríguez-Pose and Tselios, 2010).

Urban amenities and quality of life have also featured prominently in migration analyses, especially by North American scholars (e.g. Florida, 2002; Ferguson et al., 2007; Partridge, 2010). The beauty and accessibility of the natural environment or the vibrancy of a region's cultural live have been highlighted as potentially the main magnet for the attraction of talent and skills (Partridge, 2010), although their influence may be waning in recent times (Partridge et al., 2011).[2]

Finally, structural features of the local economy may also affect specific types of skill-related labour demand and therefore migration patterns across regions. The dual labour market theory (Piore, 1979) highlights that migration is driven by a constant demand of migrant labour related to the economic structure of a geographical area. Different territorial characteristics are therefore likely to shape a region's economic structure and thereby its intrinsic labour demands (Massey et al., 1998). The structure and absolute size of the local economy are important elements in attracting certain types of migrants and determining the composition of migration flows. The pattern and size of regional economies is also strongly linked to aspects of market potential. Workers tend to be attracted by regions where the market potential is high and price levels are low, whereas firms tend to cluster in areas with a beneficial access to labour demand. These forces underline that migrants are likely to be attracted by economic agglomerated areas with smaller price indexes and consequently

[2] Amenities may play a lower role in the case of Europe than in the US. In a densely urbanised environment, easy access to natural beauty is confined to a more limited number of areas. Average temperatures across the continent are also less extreme than in North America and, given its long history, availability of cultural amenities more homogenous and often directly related to city size and agglomeration. Hence, migration analyses considering amenities in Europe often reach contradictory results: while, for the case of Italy, Dalmazzo and de Blasio (2007) find that local cultural amenities attract skilled workers, they seem to play no role in decisions to migrate from graduates in the South of the country (D'Antonio and Scarlato, 2007). As a consequence, amenities are not included as an independent variable in our analysis.

higher real wages (Ottaviano and Puga, 1998). Different degrees of industry agglomeration and market potential may therefore influence consumers' and workers' decisions to move. Higher expected real wages in agglomerated areas due to competition among firms, as well as greater diversity, will enhance the pull of agglomerated regions for migrants (Surico, 2003; Pekkala, 2003). However, different views coexist regarding the effects of industry agglomeration on wages and on the spatial concentration of workers.

How important are net income advantages or pecuniary incentives relative to other factors for migration? Given the presence of a whole range of socio-economic and region specific structural characteristics which affect migration decisions on an individual-, household-, or group-level, the proclaimed predominance of wage driven migration incentives seems questionable. There are, however, relatively few empirical studies contrasting the importance of different income indicators vis-à-vis other socio-economic elements as the drivers of migration on an EU-wide regional level. This study aims to close this gap in the literature by examining which place-specific factors drive migration at a European scale and whether, as expected by the dominant theories of migration, pecuniary factors are more important than alternative explanations behind migration trends across regions in the EU.

3. Data, variables and econometric specification

3.1 Data and variables

In order to test the importance of pecuniary returns to migration across the EU's regions and to contrast these findings with a number of additional factors influencing migration, we follow the work of Sjaastad (1962), Todaro (1969), and Pissarides and McMaster (1990). This approach, which mostly addresses features of traditional migration drivers, is complemented by the use of methods introducing regional and 'place-based' socio-

economic externalities (Rodríguez-Pose and Crescenzi, 2008; Rodríguez-Pose and Tselios, 2010). In order to measure migration, we introduce the *net migration rate*, defined as the difference between annual immigration and emigration relative to total regional population size (Puhani, 2001; Crescenzi and Rodríguez-Pose 2008), as dependent variable.[3] In line with traditional migration theories we proxy pecuniary migration returns using differences in *relative regional growth rates*[4] (Haapanen, 2000) and *living standards,* the latter in the form of GDP per capita levels (Puhani, 2001; Jennissen, 2003; Greenwood, 1997). It is expected that regions with limited economic dynamism (i.e. low economic growth rates) and relatively low standards of living or a low quality of life (Assadian, 1995) will have a negative net migration rate, whereas rich and economically prospering regions will attract migrants.

Traditional migration models further highlight the importance of high *unemployment rates* as a push-factor for migration (Todaro, 1969; Harris and Todaro, 1970; Jackman and Savouris, 1992). The likelihood of finding a job depending on a region's job opportunities (vacancies) is proxied by the regional unemployment rate. We expect regions with low unemployment rates to experience migration in-flows, whereas high unemployment regions will have a negative net migration rate (Pissarides and McMasters, 1990; Puhani, 2001). Given that a worker's decision to migrate is influenced as well by a comparison of several forms of expected income opportunities in the home and in the host region we also include *social welfare payments* in the model (cf. Boyd, 1989; Day, 1992; Haapanen and Ritsilä,

[3] Because of the limited inter-regional migration data provided by Eurostat (especially for Greece and Spain) this analysis follows the approach used by Crescenzi and Rodríguez-Pose (2008) and Puhani (2001) in order to calculate the net migration rate. The data on net migration is calculated as the population change plus deaths minus births. "The net migration data retrieved in this way also includes external migration" (Puhani 2001:132) Moreover, we standardize the net migration by the average regional population. "Consequently, it is impossible to distinguish between national, intra-EU and extra-EU migration flows"(Crescenzi and Rodríguez-Pose 2008: 72)

[4] Regional economic growth rates are standardized by the respective annual mean value of all the other regions as migration is likely to be influenced by the level of income in the region of origin relative to the expected level of income that can be obtained somewhere else (cf. Pissarides and McMaster, 1990).

2007). Because of the national character of most social welfare payments, we construct a redistributional variable combining national and regional data. The aim is to connect social welfare payments determined on a national scale with a region's economic well-being. The resulting variable is calculated as the ratio of total annual national welfare payments over national GDP levels multiplied by regional GDP levels.

Following Rodríguez-Pose and Tselios (2010), we consider place-based regional externalities. These include the regional concentration of industries, which may impact migration flows by increasing the availability and remuneration of jobs in a region. However, regional agglomeration can also lead to intensified competition among workers (Rodríguez-Pose and Crescenzi, 2008). As a result, real wages can either increase or suffer from a certain downward pressure (Ottaviano and Puga, 1998). We also use total regional GDP in levels as a proxy for a region's degree of industrial agglomeration. Demographic factors and the important role of age in influencing migration decisions (Massey et al., 1993; Zimmermann, 2005) are represented by the percentage of total regional population aged between 15 and 24 years. A region's share in this age group is standardised by the value for all other regions. Social migration networks are proxied by introducing the lagged dependent variable as a regressor in our model.

We construct a 'social filter index' (Rodríguez-Pose and Crescenzi, 2008: 56) in order to capture other important regional externalities which may influence migration decisions. This composite index accounts for the 'territorially embedded' innovation enhancing features of a region. The 'social filter' therefore stands for "the unique combination of innovative and conservative […] elements that favour or deter the development of successful regional innovation systems" (Rodríguez-Pose, 1999: 82). Our social filter index is built upon two main pillars: Regional *educational attainments* and the composition of regional *productive*

resources. Regarding the former, education is believed to be one of the most important sources in determining the innovation creating capacity of a region (Lundvall, 1992; Malecki, 1997). We introduce regional education in the model as the number of persons with completed tertiary education relative to both, the total population of the region, and relative to the total number of employed people in the region. For the composition of a region's productive resources, we use the percentage of the labour force employed in agriculture as an indicator of low productivity. Agricultural employment may even be an indicator of some form of hidden unemployment, as agricultural workers show very little mobility and, in the European context, tend to be aged (Caselli and Coleman, 2001).

As educational attainments and the structure of productive resources are believed to be highly dependent on each other (Rodríguez-Pose and Crescenzi, 2008), problems of multicollinearity arise. We therefore use principal component analysis (PCA) in order to construct our social filter index with the objective "to preserve as much as possible of the variability of the initial information" (Rodríguez-Pose and Crescenzi, 2008a: 57). The first principal component accounts for 44.2% of the total variance, while the second component represents 35.6%. The coefficients of the education variables are, as expected, positive, while that of the share of employment in agriculture is negative.

The exact definition and sources of the variables included in the analyses are summarized in Table 1. All variables report regional data, with the exception of the *national growth-rate*, which is used in order to explicitly control for national unobserved effects and minimise spatial autocorrelation (i.e. the missing independence of the residuals of neighbouring

observations (Crescenzi and Rodríguez-Pose, 2008).[5]

Table 1: Data sources and exact definition of the variables

Variable	Abbreviation	Exact definition	Source
		Dependent variable	
Net migration rate	Mig	Net migration standardised by the region's population (per 1000 inhabitants)	Eurostat + authors' own calculations
		Explanatory variables	
Annual regional growth rate	dy	Growth rate of GDP PPS per inhabitant standardised by the average annual growth rate of all regions	Eurostat + authors' own calculations
Level of a region's standard of living	Yt_0	Regional GDP PPS per inhabitant	Eurostat
National social welfare expenditure	Socwelfare	National social expenditure/cap. over national GDP/cap. multiplied by regional GDP/cap. (all in PPS)	Eurostat + authors' own calculations
Regional unemployment rate	u	Regional unemployment rate standardised by the average annual unemployment rate of all regions	Eurostat + authors' own calculations
Regional industry agglomeration	Ty	Total regional GDP (levels – PPS)	Eurostat
Region's share of young people	Yo4av	People aged 15-24 years as % of total population and measured as the deviation from the annual mean value of all regions	Eurostat + authors' own calculations
National growth rate	Nay	Growth rate of national GDP per inhabitant	Eurostat + authors' own calculations
		Social Filter	
Agriculture employment	Agri	% of total employment	Eurostat
Employed people with tertiary education	Ede	% of total employment	Eurostat + authors' own calculations
Population with tertiary education	Edp	% of population	Eurostat + authors' own calculations

[5] By introducing the national growth-rate as a control variable the effect of spatial autocorrelation is minimized (Rodríguez-Pose and Crescenzi, 2008: 72). National growth rates are included as the ratios of GDP (PPS) volume changes between the current and the previous year over the GDP (PPS) level of the previous year.

The model is run for the EU-15 and covers the time period between 1990 and 2006 (time intervals are measured in years). The analysis is based on a mixture of NUTS1[6] and NUTS2 regions. NUTS1 are used for Belgium, Germany, and the United Kingdom, while NUTS2 for Austria, Finland, France, Greece, Italy, the Netherlands, Portugal, Spain, and Sweden. Countries without a regional structure were excluded from the analysis.[7] In addition, some individual regions had also to be excluded due to inadequate data availability.[8] In total, the analysis is conducted for 133 regions in 12 countries.

The majority of the data used for this analysis was obtained from the Eurostat Regio database. The variables on educational achievement, in contrast, were extracted from the Labour Force Survey Data also provided by Eurostat. In order to calculate national growth rates, data from the OECD database were used (Table 1).

3.2 Econometric specification

In order to test whether money is the main driving force behind EU regional migration, we consider a static and a dynamic time dimension. In a first set of regressions, we estimate a static migration model using heteroscedasticity-consistent cluster-specific fixed effects (FEM).[9] The cluster-specific fixed effects model introduces a term c_i in the estimation equation which captures all unobserved patterns that vary across EU regions and that are constant over time. In our model these cluster-specific fixed effects account for region-

[6] Nomenclature of Territorial Unit for Statistics as defined by the European Commission (http://ec.europa.eu/eurostat/ramon/nuts/basicnuts_regions_en.html; last visit March 12, 2010)
[7] This was the case for Denmark, Ireland, and Luxemburg. The exclusion of these countries is caused by introducing the national growth-rate in order to control for national effects.
[8] The regions excluded due to missing data are: Ceuta and Melilla, Canary Islands, all French overseas departments (Guadaloupe, Martinique, Guyane, Réunion), Länsi-Suomi, Trento, Açores, and Madeira
[9] The Hausman test systematically rejects random and between effects models in favour of the fixed effects which are strongly significant in all regressions. The high significance of fixed effects also highlights the importance of individual region-specific characteristics.

specific environmental factors or reflect different propensities to migrate across regions, potentially based on cultural grounds (Etzo, 2008). Moreover, regional migration estimations are also often prone to endogeneity problems. Given the possibility that migration may influence regional economic growth or may even shape structural features of regions, dependent and explanatory variables cannot be introduced with the same time structure. All explanatory variables are therefore lagged by, at least, one year. With this method we assume that migration decisions are based on past values and behaviours (Greenwood, 1985). In order to get a more complete picture of how different explanatory variables affect regional net migration over time, the static migration model is consecutively estimated with different lag structures imposed on all independent variables. The static model adopts the following form:

$$Mig_{it} = \alpha + \beta_{dy} dy_{it-n} + \beta_{u} u_{it-n} + \beta_{yo4} yo4av_{it-n} + \beta_{ty} Ty_{it-n} + \beta_{yt0} Yt0_{it-n} + \beta_{dynat} dynat_{it-n} + \beta_{SF} SocialWelfare_{it-n} + \beta_{SF} SocialFilter_{it-n} + c_i + \varepsilon_{it} \quad (1)$$

where individual variables are as described in Table 1 and α is the constant; i is the regional index, i ϵ [1;133]; t is the temporal index, t ϵ [1990;2006]; n is the number of time lags ϵ [1;8]; ε is the residual term

We transform the static model into a dynamic one, in order to more explicitly account for potential risks of endogeneity and to include the influence of past migration flows or migratory network linkages on current migration decisions. Given the relative small number of time periods considered and that the only available instruments are 'internal', a heteroscedasticity robust 'system Generalised Method of Moments' (GMM) estimator is used in the dynamic model estimations (Roodman, 2006). The specific estimator chosen is the Arellano-Bover/Blundell-Bond panel data estimator in its one-step estimation version. We once again impose a certain lag structure on all the explanatory variables. As a result,

the dynamic model is consecutively estimated with a zero to eight lag structure for all explanatory variables (i.e. in nine separate regressions). Regarding the specification of the used estimator, the lagged net migration rate is classified as endogenous in all regressions.[10] Moreover, the first and the second lag have been chosen as (internal) instruments for the endogenous variables in all (nine) regressions. The use of more instruments with a higher number of time lags did not significantly change the results.

The dynamic model adopts the following form:

$$Mig_{it+n} = \alpha + \beta_{mig} Mig_{i,t+(n-1)} + \beta_{dy} dy_{it-n} + \beta_{u} u_{it-n} + \beta_{yo4} yo4av_{it-n} + \beta_{ty} Ty_{it-n} + \beta_{yt0} Yt0_{it-n} + \beta_{dynat} dynat_{it-n} + \beta_{SF} SocialWelfare_{it-n} + \beta_{SF} SocialFilter_{it-n} + \varepsilon_{it} \quad (2)$$

where all variables are as described in Table 1.

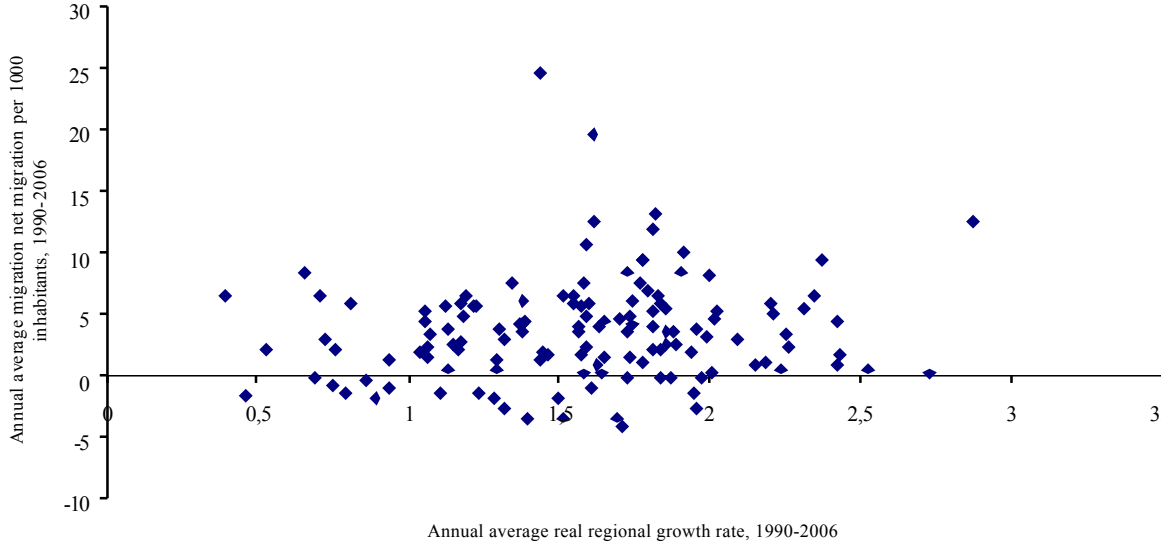
4. Results

4.1 Regional net migration and pecuniary migration incentives in the EU

Figures 1 and 2 provide visual representations of the issues under analysis. Figure 3 plots the average regional growth rate of each region against the corresponding net migration rate over the period 1990-2006. With the exception of a few outliers, almost all data observations are distributed along an imaginary horizontal band, indicating that, on average, differences in regional growth rates across EU regions cannot clearly be associated with significant differences in regional net migration rates alone.

[10] In the first dynamic model regression (no lags) both the lagged net migration rate, as well as the regional growth rate, have been classified as endogenous variables. National growth rates of the country to which a particular region belongs, were introduced to minimize problems of spatial autocorrelation and are, according to the regression results of the static model in Table 2, not significant. Regressions (6) to (8) report significant positive values for the national growth rate. However, we exclude these two regressions from the interpretation due to problems of heteroscedasticity (regression 6) and due to a rejection of the Reset test (regression 8).

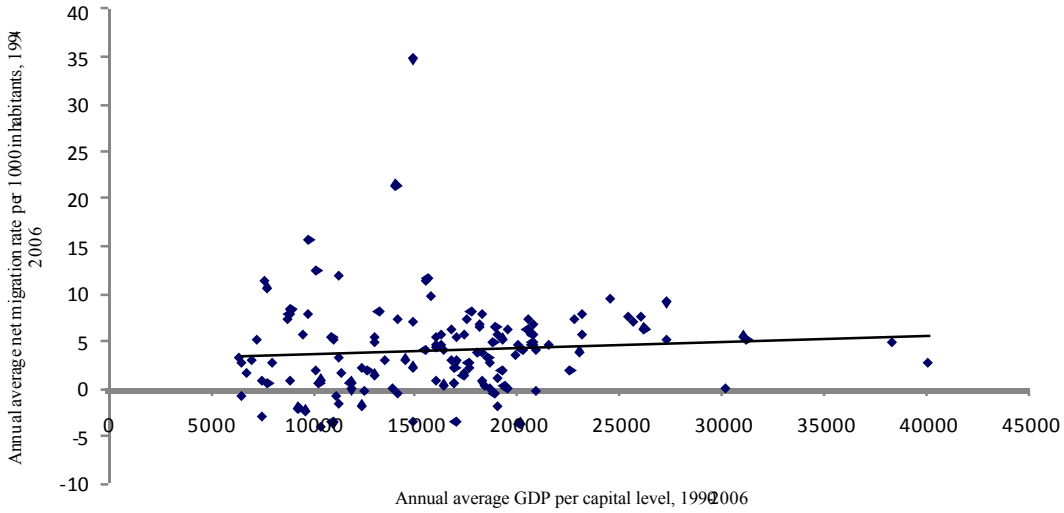
Figure 1: EU15: Regional growth rate and net migration rate, 1990-2006



Source: authors' own calculations

Figure 4 depicts the relationship between regional net migration rates and regional living standards (GDP per capita). The linear trend line seems to indicate the presence of a marginally positive relationship between regional living standards and migration. But this relationship is not significant.

Figure 2: EU-15: Regional living standards and net migration rate 1990-2006



Source: authors' own calculations

4.2 Regression Results

Static model

This section introduces the regression results of the static heteroscedasticity robust cluster-specific fixed effects migration model (Table 2). The results of the static model show that pecuniary factors tend to have a more nuanced effect on cross-regional migration in Europe than could have been expected according to the dominant migration theories. A region's growth rate has only a significant (negative) influence on net migration movements with a seven or eight year lag (Table 2). This result, however, has to be interpreted with caution, given the results of the Reset tests for regression (7) and (8). Regional economic dynamism (as a proxy for higher short-term earning opportunities) thus seems to have no impact on individual migration decisions. A region's standard of living, calculated as regional GDP per capita, however has a significant influence on the net migratory balance in all regressions. This result reinforces the continuous importance of a region's standard of living in the past for migration decisions today. The positive influence of regional wealth on regional net migration movements increases slightly when accounting for values lying further in the past (cf. regressions (1) to (6)). The relative small size of the respective coefficients, however, indicates that the regional standard of living (as a potential sign for higher expected earnings) is much weaker than previously assumed on the grounds of traditional migration theory. The combination of a relative small impact of a region's standard of living with the results obtained for the regional economic growth-rate puts in perspective the proclaimed predominance of potential pecuniary rewards as the main lure for migrants across European regions. In addition, regional industry agglomeration which may under certain circumstances also serve as a potential alternative indicator of earning opportunities is shown to have no continuous significant influence on regional net migration. The exceptions are regressions (2) and (8), where the concentration of economic activity is reported to have

a very weak positive influence. Overall, industry agglomeration on a regional level is not an essential driver of cross-regional migration in Europe.

The insignificance or weak significance of the coefficients for pecuniary migration incentives puts the focus on other regional aspects which are likely to be at least as important as monetary perspectives for the attractiveness of European regions towards potential migrants.

One of these factors is regional unemployment rates. They have, as expected, a significant negative impact on a region's net migration rate. Regions where individuals have a lower probability to find a job are on average characterized by an outflow of people. However, the influence of the unemployment rate diminishes over time, both in terms of absolute values of the coefficients, as well as in terms of significance levels. Finally, the influence of the unemployment rate becomes completely irrelevant after regression (4). Any effect of past unemployment rates on current workers' decisions to migrate disappears completely after four years. Hence a region's unemployment rate is rather important for migration decisions in the short-run, but wholly irrelevant in the medium- and the long-run. The coefficient of the share of young people in a region displays a relative substantial negative influence on regional net migration, however only up to a lag of three years. Regions with a higher than average share of young people are more likely to experience a migration outflow than regions with an older population structure. Besides lower migration barriers and higher life-time earning-perspectives of an 'investment in migration' for young movers (Borjas, 1989; Zimmermann, 2005), the outflow of (young) people may also reflect a higher competition among the young for available jobs in regions where the population is relatively young. Faced with high competition for available jobs, young people may therefore be forced to leave their home region in order to find a job somewhere else.

Social welfare payments, measured as the ratio of national welfare spending over national GDP multiplied by regional GDP, have a very weak positive impact on net migration. However, a significant influence could not be reported for regressions (4), (6) and (7). This could highlight the limited time horizon (around three years) of the influence of past social welfare spending on current migration decisions. Put differently, regions with a well developed social system tend to attract migrants only in the short-run.

Finally, the 'social filter index', describing the 'territorially embedded' innovation enhancing character of a region, shows a positive correlation with the regional net migration rate. Its continuous impact in all eight regressions points to the general high importance of (innovation-enhancing) social conditions in order to attract migrants. Hence territorially embedded characteristics, such as the existence of a favourable educational environment and the associated opportunities for migrants to increase their own productivity through interaction with each other (Rudd, 2000; Acemoglu and Angrist, 2001; Di Addario and Patachini, 2008) seem crucial in the potential of any European region to attract migrants.

Deconstructing the social filter into its individual components yields interesting results. First, among the factors that compose the social filter index, educational variables are highly important. The level of education of the employed labour force has a strong positive influence (0.7174) on the filter index. The presence of a high-tech or high-skilled labour force tends to attract people, once all other factors are controlled for. These findings support to some extent the hypothesis that highly educated people are more likely to move to areas with an already highly skilled labour force and with industries requiring highly-skilled labour. People eligible to work in such industries will find (better paid) jobs and are

therefore more likely to migrate. The educational level of the total regional population has also a positive influence (although not as strong (0.0514)). The slight positive impact of the latter variable may signal a positive influence of a good regional educational system on net migration movements. Second, the composition of productive resources in a region, proxied by the relative number of people employed in agriculture has a negative influence in the framework of the social filter (-0.6948) and impacts net migration negatively. Regions with a more backward sectoral composition (high percentage of workers in the agricultural sector) tend therefore to lose people.

Table 2 - EU15: Static heteroscedasticity robust fixed effects regression of the regional net migration rate

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Number of lags used for all explanatory variables	lag 1	lag 2	lag 3	lag 4	lag 5	lag 6	lag 7	lag 8
constant	7.771033	6.17128	2.257153	-0.7504549	-3.974604	-13.02831*	-17.57638**	-17.83562**
	(4.825125)	*(4.809819)*	*(5.167822)*	*(5.533122)*	(6.047764)	*(7.446514)*	*(8.36357)*	(8.264751)
Regional unemployment rate (u)	-4.564859***	-3.563174***	-2.338552 **	-1.628701*	-0.7461349	0.7695321*	2.029845*	2.156954*
	(0.9732543)	*(1.003529)*	*(1.023599)*	*(0.9842363)*	*(0.9867643)*	*(1.035306)*	*(1.123488)*	*(1.208864)*
Regional growth rate (dy)	-0.0066169	-0.0424577	-0.034256	-0.0028028	-0.0702049	-0.0802821	-0.142259***	-0.1595286***
	(0.0586217)	*(0.0486346)*	*(0.0432929)*	*(0.0455806)*	*(0.0515477)*	*(-1.82)*	*(0.0493105)*	*(0.0564483)*
Region's share of young people (yo4av)	-7.238715*	-7.57828**	-7.64933*	-6.733013	-4.782299	-1.265705	-0.7982334	-0.7228066
	(3.77242)	*(3.750799)*	*(4.091144)*	*(4.793315)*	*(5.551373)*	*(5.990049)*	*(6.328007)*	*(6.249891)*
National growth rate (dynat)	-0.1100919	0.0891629	0.0782111	0.0534249	0.100899	-0.1535336*	0.0522028	0.2164979***
	(0.1092639)	*(0.0982809)*	*(0.0896191)*	*(0.0810656)*	*(0.086289)*	*(0.0926435)*	*(0.0832721)*	*(0.0809474)*
Regional wealth (yt_o)	0.0003883*	0.0003876*	0.0005176 **	0.0005858**	0.0006194***	0.0008518***	0.0008462**	0.0007449**
	(0.000238)	*(0.0002324)*	*(0.000246)*	*(0.0002432)*	*(0.0002374)*	*(0.0002872)*	*(0.0003324)*	*(0.0003429)*
Regional industry agglomeration (ty)	0.00000259	0.00000344*	0.0000165	0.0000261	0.0000227	0.000049	0.0001259	0.0001688*
	(0.0000381)	*(0.0000404)*	*(0.0000415)*	*(0.0000464)*	*(0.0000558)*	*(0.0000705)*	*(0.0000823)*	*(0.0000845)*
Social Filter	0.1297378 *	0.2210792 ***	0.2556374***	0.2729565***	0.3146224***	0.3309161***	0.2892611**	0.3066836**
	(0.0768229)	*(0.0783195)*	*(0.0785592)*	*(0.0809718)*	*(0.1147081)*	*(0.1158337)*	*(0.1284978)*	*(0.1269575)*
Social welfare spending	0.00001***	0.0000112 ***	0.0000129***	0.00000623	0.00000819***	0.00000400	0.00000363	-0.0000115*
	(0.00000322)	*(0.00000308)*	*(0.00000350)*	*(0.00000393)*	*(0.00000274)*	*(0.00000281)*	*(0.00000297)*	*(0.00000622)*
R^2 within	0.1942	0.1877	0.1865	0.1703	0.1464	0.1252	0.1219	0.1183
F (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
observations	2073	1940	1807	1674	1541	1408	1280	1152
Heteroscedasticity (χ^2 test statisitc=n*R^2)	14.3037	8.73	7.4087	8.7048	10.4788	19.1488	14.208	11.6352
RESET	0.2367	0.1356	0.0773	0.2944	0.8915	0.4237	0.0003	0.0002

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses.

Table 3 - EU15: Dynamic heteroscedasticity robust one-step GMM regression of the regional net migration rate - two instrumented lags

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Number of lags used for all explanatory variables	no lag	lag 1	lag 2	lag 3	lag 4	lag 5	lag 6	lag 7	lag 8
constant	2.026632	0.497106	0.0599503	0.4943516	0.4021109	0.0875911	-1.249148	-3.188772	-2.41491
	(1.410433)	*(1.428338)*	*(2.319269)*	*(3.098992)*	*(3.819844)*	*(4.548822)*	*(5.203012)*	*(5.65259)*	(6.156975)
Lagged net migration rate (mig-n)	.7670997***	0.7818215***	0.6872863***	0.5965996***	0.5229773***	0.4155296***	0.3285547***	0.3494587***	0.2652046**
	(0.0528931)	*(0.0509049)*	*(0.0585061)*	*(0.0651047)*	*(0.068827)*	*(0.0782147)*	*(0.0863126)*	*(0.1033346)*	*(0.1133115)*
Regional unemployment rate (u)	-0.5082866**	-0.5143027***	-0.2846236	-0.0398135	-0.0461411	0.1237908	0.3744447	0.9633254	1.033216
	(0.219775)	*(0.1857405)*	*(0.2609468)*	*(0.3155803)*	*(0.3920013)*	*(0.4807951)*	*(0.6147681)*	*(0.7549092)*	*(0.8415774)*
Regional growth rate (dy)	0.1095681	0.0327961	-0.023138	0.0142711	0.0457977	-0.0730995	-0.0677403	-0.0963383*	-0.0753624
	(0.0664606)	*(0.0541181)*	*(0.03674)*	*(0.0331796)*	*(0.0399761)*	*(0.0476767)*	*(0.0519562)*	*(0.0491541)*	*(0.049852)*
Region's share of young people (yo4av)	0.119927	0.8972873	1.265364	1.227045	1.760881	2.133658	3.83484	4.686266	4.481951
	(1.16584)	*(1.193867)*	*(1.956208)*	*(2.670298)*	*(3.34024)*	*(4.083319)*	*(4.76769)*	*(5.184939)*	*(5.6592)*
National growth rate (dynat)	-0.1801297**	0.1457491**	0.3494961***	0.2687425***	0.2893596***	0.5357573***	0.2840292**	0.4083757***	0.4369081***
	(0.0833448)	*(0.0699743)*	*(0.0701594)*	*(0.0799236)*	*(0.0917951)*	*(0.0866036)*	*(0.1261511)*	*(0.1167821)*	*(0.1060938)*
Regional wealth (yt_o)	-0.0000437**	-0.0000241	-0.0000351	-0.0000486	-0.000059	-0.0000593	-0.0000353	0.00000136	-0.00000292
	(0.0000199)	*(0.0000188)*	*(0.0000286)*	*(0.0000364)*	*(0.0000433)*	*(0.0000516)*	*(0.0000607)*	*(0.0000683)*	*(0.0000736)*
Regional industry agglomeration (ty)	-0.00000185	-0.00000144	-0.00000219	-0.00000322	-0.00000323	-0.00000342	-0.00000424	-0.00000491	-0.00000519
	(0.00000113)	*(0.00000110)*	*(0.00000177)*	*(0.00000234)*	*(0.00000289)*	*(0.00000350)*	*(0.00000399)*	*(0.00000430)*	*(0.00000468)*
Social Filter	0.0299759**	0.0162523*	0.0410525***	0.0492257**	0.050931**	0.0494449	0.0463528	0.0324796	0.0359372
	(0.0126348)	*(0.0095079)*	*(0.0139621)*	*(0.0192543)*	*(0.0244731)*	*(0.0321293)*	*(0.037777)*	*(0.040588)*	*(0.0453245)*
Social welfare spending	0.00000543	0.00000523*	0.00000252	0.0000455*	0.00000255	0.00000994	-0.00000261	0.00000193	-0.0000184***
	(0.00000306)	*(0.00000285)*	*(0.00000193)*	*(0.00000270)*	*(0.00000342)*	*(0.00000227)*	*(0.00000203)*	*(0.00000316)*	*(0.00000691)*
Hansen-J	1.000	0.642	0.002	0.003	0.001	0.004	0.001	0.004	0.003
AR (1)	0.000	0.000	0.000	0.067	0.167	0.016	0.003	0.197	0.815
AR (2)	0.099	0.079	0.337	0.148	0.106	0.095	0.019	0.028	0.020
F (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000
observations	2078	2073	1940	1807	1674	1541	1408	1280	1152
nb of instruments	280	145	129	114	100	87	74	63	53

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses.

Table 4 - Interregional net migration within EU countries - static heteroscedasticity robust fixed effects regression, all explanatory variables lagged once

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Country	Austria	France	Germany	Italy	Netherlands	Spain	United Kingdom
constant	-83.63767 *(8.652927)*	-64.81061** *(29.96996)*	9.125145 *(8.549768)*	25.46796* (13.36205)	47.58143** (20.10522)	-54.88995 *(18.11079)*	-29.88974 *(6.790288)*
Regional unemployment rate (u)	4.885608 *(3.214626)*	2.696408* *(1.402103)*	-7.734461*** *(2.379432)*	-3.78297*** (1.305633)	7.172193** (3.068717)	-4.572593** *(1.929789)*	2.153263* *(1.153921)*
Regional growth rate (dy)	0.2450643 *(0.171445)*	0.0938737 *(0.0757615)*	0.3425758*** *(0.0596319)*	*-0.0087098* *(0.0728909)*	-0.2752234** *(0.1096242)*	-0.3773303** *(0.148618)*	0.489592 *(0.1844337)*
Region's share of young people (yo4av)	77.67583*** *(8.826543)*	21.37884 *(21.23471)*	13.3611** *(5.332698)*	-14.60783** *(6.967394)*	-48.77269** *(17.89088)*	25.91782** *(10.61278)*	35.89969*** *(7.251543)*
Regional wealth (yt_o)	0.0000529 *(0.0003942)*	0.002826** *(0.0010283)*	0.0006979 *(0.0005645)*	-0.0007325 *(0.0005131)*	0.0000634 *(0.000648)*	0.0031733** *(0.001264)*	-0.0008566 *(0.000738)*
Regional industry agglomeration (ty)	-0.0001861 *(0.0003942)*	-0.0000535 *(0.0000872)*	-0.0000696 *(0.0000381)*	0.0001511** *(0.000059)*	0.000067 *(0.0001481)*	0.0002893* *(0.0001645)*	0.0000316 *(0.0000713)*
Social Filter	0.0465253 *(0.36602859)*	-0.5175668 * *(0.299026)*	-1.183791** *(0.5198335)*	*0.04272679**** (0.0714163)	-0.2105581 *(0.1644734)*	-0.2706229 *(0.307724)*	0.2324903 *(0.2645966)*
Social welfare spending	-0.000016** *(0.00000698)*	0.00000935 *(0.0000289)*	-0.00002** *(0.00000758)*	0.0000177** *(0.00000729)*	0.0000359 *(0.0000239)*	0.00000766 *(0.0001122)*	-0.0000149 *(0.00000764)*
R^2within	0.5294	0.37	0.5527	0.6266	0.326	0.6803	0.1317
F (p-value)	0.0001	0.0000	0.0000	0.0000	0.0024	0.0000	0.0000
observations	144	352	160	304	192	256	192
Heteroscedasticity (χ^2 test statistic=n* R^2)	8.28	22.6336	29.952	72.8688	19.1232	25.4464	4.3968
Normality test (p-value)	0.0058	0.0000	0.0902	0.0021	0.0021	0.2696	0.0000
RESET	0.2087	0.9405	0.8784	0.0032	0.5004	0.0199	0.9072

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses.

Dynamic model

The main advantage of the dynamic over the static model is the possibility of introducing the past migration trajectory as a means to control for path dependency and for the presence of social networks, as well as addressing issues of endogeneity, by means of a heteroscedasticity robust 'system GMM' estimation. The lagged dependent variable is therefore introduced as a regressor. According to the regression results reported in Table 3, past migration flows are extremely significant in all nine regressions (at a 1% level of significance) and have a positive and over time declining influence on current net migration. Past migration trends are thus more relevant in the short-run than in the medium-run. This result confirms the presence of a certain 'path dependency', meaning that current migration flows towards a particular region are determined by chain migration effects and by the migration destination decision of earlier migrants (Massey and Gracia, 1987; Bauer and Zimmermann, 1997; Shah and Menon 1999). In other words, the higher the number of immigrants in a particular host region, the higher the migration flows towards this particular host region. However, network effects among migrants seem based on more recent migration flows than those farther in the past, as signalled by the declining coefficient once time lags are added (cf. regression (1) to (9), Table 3).

The high and positive influence of past migration hides the risk that this variable may have an impact on the significance of the results for all the other explanatory variables reported in Table 2. Hence, the remaining results of the dynamic model should be considered with caution, especially – according to the misspecification performed tests – the coefficients for observations lying further in the past (i.e. for regressions with more than one time lag – see Table 3). As a result, the interpretation of the dynamic model will mostly be concentrated on regressions (1) and (2).

The coefficients for the regional growth rate and the regional standards of living tend to confirm the findings of the static model, where both indicators were shown to have only a weak economic impact. The same can be said for regional industry agglomeration.

Unemployment, by contrast, has a strong significance in regressions (1) and (2) of the dynamic model, pointing to a negative short-run correlation with the net migration flows. The estimation results in Table 3 further show that the regional ratio of young people relative to other regions has no significant influence on regional net migration movements for the dynamic model. This stands in contradiction with the results of the static model. Social welfare spending, on the contrary, is significant in regressions (2) and (4) leading to the conclusion that the latter might have a small influence on migration in the short-run rather than in the long-run.

A further interesting result of the dynamic analysis is that, compared to the static model, the national growth rate is strongly significant over time (significance levels between 1% and 5% in all regressions). It shows moreover, a positive relationship with the regional net migration rate – with the exception of regression (1) – indicating that the level of past national economic growth rates is of some relevance for current cross-border migration decisions. This could point to the conclusion that national economic growth rates are a much more visible wage signal than their regional counterparts. Finally, the social filter is also in once again strongly significant in regressions (1) to (5), implying that the same conclusions can be drawn as for the static perspective. Its positive influence is, however, approximately five to eight times weaker compared to the estimation results obtained for the static model.

Cross-country comparison

In order to get an idea of whether significant differences regarding inter-regional migration patterns exist among European Member States, we conduct the static analysis for individual countries. The results of Table 4 point to the existence of interesting cross-country differences in the determinants of migration.

In Germany, the Netherlands, and Spain – and, in contrast to the EU-wide results – regional economic growth exerts a significant influence on the regional net migration rate. However, this influence is positive only in Germany, reporting that German regions with higher economic growth rates tend to attract people. According to the regression results, growing regions in Austria, Italy, and Britain tend to lose people, possibly reflecting a preference for commuting or the choice to locate in neighbouring regions rather than in the growth-centres itself. The second pecuniary migration indicator (GDP per capita) exerts only a small positive influence in France and in Spain, putting the limited effect of pecuniary incentives as migration drivers further in perspective.

Regional unemployment has a significant impact on regional net migration movements in almost all EU member states, although not always in the expected direction (cf. France, the Netherlands, and the UK). The high significance across almost all EU member states of a region's share of young people further highlight the importance of a region's age and demographic structures for migration. The overall direction of youth on migration decisions is however less clear-cut. While regions in Italy and the Netherlands with a high share of young persons tend to lose people, 'young' regions in Austria, Germany, Spain, and the UK tend to attract people.

The results for Italy, furthermore, tend to substantiate anecdotal evidence of considerable South-North migration movements. Relatively sluggish and inflexible labour markets in the Southern part of Italy combined with a relatively young population structure and hence a greater competition for available jobs among young workers may have lead to a significant outflow of (young) people from Southern Italian regions. This tends to be corroborated by a positive influence of regions with a high degree of industry-agglomeration, lower unemployment, favourable socio-economic conditions, and a well functioning social security net (i.e. North-Italian regions) on potential movers.

Regional migration flows in France seem to be only determined by regional unemployment rates, the socio-economic structure of a region, and, to a lesser degree, by regional living standards. Similar results can be reported for Spain and the UK with the difference that in Spain and the UK a region's demographic structure seems to play a much stronger role. Favourable socio-economic conditions and regional living standards (the latter only for the UK) have, however, no role for inter-regional migration in these two countries.

Inter-regional migration in Germany is, apart from the percentage of young people, regional economic growth and unemployment rates, also influenced by the socio-economic character of a region. The overall results for Germany may therefore point to more dynamic regions in the Southern and Western parts of Germany (with relatively more young people) which tend to be more attractive to potential movers than less dynamic regions with an older population structure, such as the former East German *Länder*. Social welfare spending has a weak but significant negative influence on regional net migration, pointing to a limited influence of social welfare expenditures for nation-wide migration.

4.3 Robustness

A number of tests have been performed in order to assess the robustness of the static and dynamic migration models. Most of them are reported below the respective regression results in Table 2 and Table 3. Regarding the static model (in Table 2) the R-square within estimates emphasise the general goodness-of-fit of the static model. The F-test of joint insignificance of the explanatory variables is in all cases strongly rejected at all the relevant levels of significance. In addition, even if it was not absolutely necessary, as heteroscedasticity robust estimators have been used, a Breusch-Pagan heteroscedasticity test has been computed. Almost all test statistics are below the critical value (see Table 2), showing no sign of the presence of heteroscedasticity. Several 'Reset' tests have also been computed in order to take into account potential problems of linear misspecification. Most of the respective 'Reset' p-values are above the 5% level of significance indicating a general good linear specification of the static model.[11]

In order to test for multicollinearity among the explanatory variables, Variance Inflation Factor (V.I.F) tests have been performed on pooled-data versions of the eight different static model specifications. Given that our model is based on a panel-data estimation with non-negligible individual fixed effects, the V.I.F test based on pooled regressions can only deliver limited results. The tests do not report multicollinearity for the static model, a result which is corroborated by a correlation matrix in which no explanatory variable is strongly correlated to any other.

The estimation results of the dynamic panel-data heteroscedasticity-consistent 'system GMM' regressions are presented in Table 3. The most important difference with respect to the static

[11] The only exceptions are the Reset test results of the 7th and 8th regression, which may signal that most of the variables lose their influence on net migration after a period of 6 years.

model estimated above is the introduction of the lagged dependent variable as a regressor. The misspecification tests are reported in the bottom half of Table 3. The F-test of joint insignificance of the explanatory variables is in all cases strongly rejected at a 5% level. The p-values of the Hansen-J statistic reported in Table 3 are, only for the first two regressions using a zero and a one year lag structure, above the 10% significance threshold (p-values are equal to 1.000 and 0.642 respectively). This reflects a certain difficulty to find robust instruments for the other regressions.[12]

In addition, we perform an Arellano and Bond (1991) test in order to detect any "autocorrelation in the idiosyncratic disturbance term ε_{it}" (Roodman, 2006: 31). The p-values of the autocorrelation tests (H0: non-correlated error terms) of first and second order are reported in Table 3. The tests for first and second order autocorrelation in the error terms deliver for all nine regressions mixed results. However, in all regressions except regression number (7) either the first or the second lag can be used as a valid instrument. Regarding potential multicollinearity issues, a similar approach has been chosen for the dynamic model as for the regressions based on the static model. The results reflect no concern for multicollinearity.

The results of the static country based estimations are given in Table 4. Misspecification tests, reported at the bottom of the table, generally speak in favour of the robustness of the results; however, some results have to be interpreted with some caution given the features of some of the test statistics.

[12] Another small caveat of the regression results reported in Table 3 is the large number of instruments (especially in the first two regressions with 1 and 2 lags respectively) compared to the number of individuals (133). According to Roodman (2006), too many instruments can lead to an overfit of the endogenous variables which may be indicated by a perfect Hansen statistic of 1.000 (Roodman, 2006: 40).

5. Conclusion

The main purpose of this paper has been to assess the role of pecuniary factors in comparison to other alternatives as a major driver for migration. Given the substantial growth and income disparities across EU's regions, we examined the question of whether regional migration in the EU follows money and contrasted these findings against other potential migration drivers. The impact of money and other relevant factors on migration has been analysed by means of a static and dynamic migration model covering 133 European regions and a time horizon of 17 years.

The combined results of the static and dynamic models tend to cast doubts about the relevance of traditional migration theory for recent cross-regional migration trends in Europe. The results give little support to the idea of migration following regional wealth or economic dynamism. It is therefore hardly possible to claim that migration across EU's regions mainly follows the money, in contradiction with most traditional migration theories where money is reported to play an essential role in shaping individual migration decisions. The findings may however also point to the fact that substantial migration barriers, in the EU, still exist which may result in a likely reduction of possible monetary rewards to migration.

The results, however, suggest that other factors, such as the likelihood of finding a job, past migration trends and the presence of migrants from a similar origin, social security related aspects, or the availability of a good educational system and further human capital related regional characteristics, are decisive elements for inter-regional migration across the EU's regions. The influence of these factors also varies according to the time frame considered. Whereas some – mainly unemployment, past migration trends, and welfare expending – operate fundamentally in the short-run, others, such as the presence of an adequate social

filter, have an association with net migration trends which is longer lasting. In addition, the significant positive results of the social filter index reinforce the view that it may be easier for high-skilled rather than for low-skilled workers to find jobs in other regions and, thus, to move. This may also hide the fact that highly educated people are much more sensitive to inter-regional wage and employment differentials.

The study has additionally revealed important differences among EU countries in the factors that determine migration patterns. While in some countries pecuniary migration incentives seem to exert some influence on inter-regional net migration, this is not the case in most others. Unemployment and youth generally play a more important role in almost all Member States analysed.

This paper set out to reveal some new insights on migration determining factors on an EU-wide regional level. It may, however, also be understood as a call for further research in order to develop policy recommendations concerning inter-regional mobility in the EU and beyond. Further studies could be conducted by means of gravity models in order to directly link sending and receiving regions. In addition, it would also be interesting to see how migration movements are influenced by the size of regional manufacturing and services sectors, as well as, to explicitly investigate the role of human capital and education on EU-wide regional net migration rates.

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