WIFO
ÖSTERREICHISCHES INSTITUT
FÜR WIRTSCHAFTSFORSCHUNG

WORKING PAPERS

Regional Labour Market Disparities in an Enlarged European Union

Peter Huber

309/2008

Regional Labour Market Disparities in an Enlarged European Union

Peter Huber

WIFO Working Papers, No. 309
February 2008

E-mail address: Peter.Huber@wifo.ac.at
2008/026/W/0

Regional Labour Market Disparities in an Enlarged European Union

Peter Huber *
Austrian Institute for Economic Research (WIFO)
Arsenal, Objekt 20
1030 Wien
Austria
e-mail: huber@wifo.ac.at

Abstract

We characterize regional labour market problems in the EU27 using disaggregate data on regional employment, unemployment and participation rates, by gender and 10 year age groups at NUTS 2 level. We ask whether accession changed disparities in regional labour market conditions and to what degree the structure of employment, unemployment and participation rates in the NMS12 differs from the EU15. We find that aggregate labour market disparities are comparable between the two country groups but that there are important structural differences. Performing a principle components analysis we find that five principal components (four of which are associated with the structure of employment and participations rates) explain around 90% of the variance in the data. Cluster analysis suggests that NMS regions are most similar in structural labour market characteristics to many German and French NUTS 2 regions. Regression analysis suggests that the correlates of aggregate regional employment and unemployment rates between the two groups do not differ dramatically but that there may be some differences with respect to employment rates of individual demographic groups.

JEL-Code: J6, R12, R23
Key-Words: Regional labour market disparities

1. Introduction

Among the many important steps to European integration marking the last two decades, the two waves of accession of the Central an Eastern European countries (CEEC) to the European Union (EU) in 2004 and 2006 were undoubtedly among the most intensively debated. It was expected that these enlargements, which covered a total of 12 countries, with a population of over 100 million inhabitants and a GDP of over € 1,300 billion would present major challenges both to the 12 new member states (NMS12) as well as to the 15 pre-existing EU countries (EU15). In particular on the side of the NMS12 the implementation of the acquis communautaire (Burda, 1998), eligibility for EU structural funds (Boldrin and Canova, 2001), potential membership in the European monetary union (Gros, 2000) and the benefits from the liberties guaranteed in the European Economic Area (Belke and Hebler, 2001) were discussed. On the side of the the EU15, by contrast, hopes for increased growth due to integration co-existed with fears with respect to potential migration and increased competitive pressures (Boeri and Brücker, 2000).

Aside from these issues, accession of the NMS12 as has, as recently pointed out by Caroleo and Pastore (2007), also changed the economic and political geography of the EU. This too raises a number of normative as well as analytical issues. The CEEC among the NMS12 have just emerged from a phase of massive industrial and institutional restructuring, which raises renewed analytical interest in the consequences of structural change for regional labour markets (e.g. Caroleo and Pastore, 2007) and on the capability of European regional labour markets to adjust to region specific shocks (Gacs and Huber, 2005, Bornhorst and Commander, 2006). On the policy side, by contrast, the fact that the NMS12 are largely composed of lagging regions has shifted the allocation of EU-structural funds towards these countries. This raises the issue of whether these funds are an adequate instrument to enhance regional development in these countries and which regional policies are most suited to combat regional labour market problems.

Addressing these issues requires a clear picture of the relevant differences and similarities in regional labour market problems in the different parts of the EU. Thus a number of recent contributions have focused on analysing regional labour market problems in the EU (e.g. Overmann and Puga 2002, Perugini and Signorelli, 2004). Only few contributions have, however, focused on regional labour market problems in the

EU27 in total. Furthermore, most of these studies focus only on aggregate indicators such as the unemployment rate, without giving consideration to the substantial differences in the structure of employment, unemployment and participation in the regions of the EU27.

In this paper we analyse regional data on employment, unemployment and participation rates for 258 NUTS2 regions of the EU27 disaggregated by gender and 10 year age groups. We add to the literature by taking a broad view of the regional labour market situation. While our aims are primarily descriptive, we believe this will provide a more comprehensive view of regional labour market disparities in the EU27 than is currently available. After a short literature survey, which is used to formulate hypothesis, section 3 presents data and a descriptive analysis on both a national as well as a regional level. This section addresses the issue to what degree regional labour market problems in the EU27 have changed relative to the situation in the EU15. Section 4 then presents results of a principle component analysis conducted on disaggregate labour market indicators, while section 5 uses these results to analyse differences between the EU15 and the NMS12 on the basis of a discriminant and a cluster analysis. Section 6, analyses to what degree the correlates of the different labour market outcomes vary between the EU15 and the NMS12, by regression analysis. Section 7 concludes by presenting issues for future research.

2. Literature Survey

The background to this paper is shaped by three distinct but interrelated strands of literature relating to regional labour market problems in the EU27. The first is on regional development in transition economies (see Ferrangina and Pastore, 2005, 2007 and Huber, 2007 for surveys), to which most of the NMS12 belong. This literature stresses the relationship between structural change and regional development. For instance Ferragina and Pastore (2005 and 2007) in recent surveys argue that optimal speed of transition (OST) theory (see Aghion and Blanchard, 1994, Boeri, 2000) offers two explanations for high and persistent disparities in regional unemployment rates. The first holds that regional unemployment rate disparities arise from different equilibrium outcomes with high unemployment rate regions experiencing similar labour market flows as low unemployment regions in all periods but early transition and little correlation between measures of restructuring and regional unemployment. The second explanation suggests that regional disparities reflect different speeds of restructuring. In this case high

unemployment regions have high worker flow rates throughout transition and correlations between regional unemployment rates and measures of restructuring are high. From their literature survey Ferragina and Pastore (2007) conclude that the evidence favours interpretations where persistent unemployment rate disparities reflect differences in the speed of restructuring in transition.

Huber (2007) finds that regional disparities increased in almost all transition countries in the early years of transition, the regional distribution of labour market indicators has been relatively stable and there is some indication of regions diverging into two groups: a small group of well to do regions and a larger group of poorer regions. When focusing on the long run determinants of regional differentiation in terms of unemployment and GDP he suggests that in particular capital cities and regions closer to EU borders have experienced higher growth and lower unemployment. By contrast spill-overs within countries tend to be small. Regions located closer to capital cities do not profit from their vicinity to these regions to the same extent as in many mature market economies. Finally, when reviewing the literature on regional labour market adjustment he finds that hopes for regional labour market disparities to diminish through the traditional channels of migration, wage flexibility and capital mobility are bleak and that transition economies' regional labour markets may be considered as inflexible as the old EU countries'.

This literature thus suggests that - due to more intensive industrial restructuring – regional labour market problems in the CEEC among the NMS12 may be of a different nature than in the EU15. This applies to both the demographic as well as the regional structure of employment, unemployment and participation. One could, for instance, hypothesize that with respect to the demographic structure male workers should have worse labour market outcomes in the NMS12 than in the EU15, since they were most strongly affected by employment decline in industry. In addition long term unemployment should be a more serious problem on account of a high mismatch component in unemployment, resulting from structural change. Furthermore, the structure of regional labour market problems should be more closely related to the industrial structure and structural change of regions in the NMS12. In addition, enlargement may have changed the EU-wide distribution of regional labour market problems, which may require a new focus of EU-wide labour market policies.

The second strand of literature related to this paper is on regional labour market disparities in mature market economies. This has used a variety of methods to determine, which labour supply and demand side as well as institutional factors shape regional labour market outcomes. Elhorst (2003) in a recent survey categorizes this literature and defines a set of variables, which, he suggests, should be included in all analyses of regional differences in unemployment. Aside from this he also documents the scarcity of research that focuses on regional labour market disparities from a European perspective. Most contributions to date focus on case studies of one or a few countries, and only 2 of the 41 studies covered by Elhorst (2003) can actually claim to be representative for the EU (although even these studies cover only the EU12). While this lack of comparative work continues, a few studies with a more European focus have appeared recently. Among these Overmann and Puga (2002) use non-parametric and parametric techniques to show that regional unemployment rate disparities in the EU are highly persistent. Furthermore, they find that high unemployment regions in the EU are geographically clustered, with country borders having a small impact on the relative performance of a region and the labour market situation of neighbouring regions having a large impact. Perugini and Signorelli (2007) focusing on the EU15 from 1997 to 2006 find high persistence but also a mild tendency for sigma convergence of employment, unemployment and long-term unemployment rates. Their results suggest that regions with low employment rates have high long term unemployment rates, low population density and low per capita incomes. By contrast high unemployment and long term unemployment regions have a low population density and low per capita incomes. Zeilstra and Elhorst (2006) using data on 11 EU countries find substantial heterogeneity of coefficients across countries when regressing regional unemployment rates on indicators deemed to important in explaining regional unemployment rates.

Most of these studies also analyse effects of labour market institutions on regional labour market outcomes. Perugini and Signorelli (2007) find that active labour market policies reduce regional unemployment and long term unemployment rates but have no effect on employment rates, higher tax wedges and increased product market regulation, by contrast, increase unemployment and reduce employment rates and spending on passive labour market policies increases the employment rate but reduces both the unemployment and long-term-unemployment rate. Zeilstra and Elhorst (2006)

find that higher tax wedges and higher unemployment benefits increase regional unemployment rates, while higher levels of centralisation of wage bargaining reduce them. The only papers we are aware of that use data on new member states besides data from the EU15 are Longhi, Nijkamp and Traistaru (2005) and Perugini and Signorelli (2004). Longhi, Nijkamp and Traistaru (2005) use data at NUTS1 level from 1995 to 2001 and focus of the role of bargaining institutions and sectoral specialisation. They find that specialisation increases regional unemployment rate disparities most in countries with intermediate and decentralised collective bargaining institutions. Perugini and Signorelli (2004) by contrast focus on the NUTS2 level and concentrate on analysing convergence in employment rates for the period from 1993-2003. They find beta divergence for the NMS but a mild tendency of convergence for the EU15.

These contributions thus suggest that aside from regional factors also (national) institutions play an important role in shaping regional labour market disparities in the EU. Again this can be used to formulate hypotheses with implications for both the regional and demographic structure of labour markets. With respect to the former, regional disparities should be larger for demographic groups where institutions most strongly affect the labour market outcomes (i.e. the young, the older and potentially women). With respect to the later – to the degree that institutions are national – employment, unemployment and participation rates of regions within the same country should be more homogenous than between countries and this higher homogeneity should be highest for labour market groups most strongly affected by labour market institutions.

Finally, a third strand of literature, to which we relate primarily in terms of methodology, uses explorative data analysis to identify region types in the EU. Again this literature has followed a wide set of methods and objectives. Regional labour market typologies exist both for the CEEC among the NMS12 (e.g. Scarpetta and Huber, 1995) as well as for individual CEECs (e.g. Fazekas, 1996) and for the EU (e.g. Wiese et al, 2001). For this literature too, there is a lack of results for the EU27. The early contributions (Huber and Scarpetta, 1995, Wiese et al, 2001) focus exclusively on the CEEC of the NMS12 or the EU and in some cases use regional breakdowns that do not exist anymore today. To the best of our knowledge the only exception to this is Aumayr (2007). She classifies the 1212 NUTS3 regions of the EU 25 into 14 region types according to their industrial specialisation, productivity and accessibility. She finds that

only some of these region types show regional convergence and that lower steady state incomes can be expected mostly in peripheral regions.

3. Data and Descriptive Analysis

Thus recent literature suggests a number of hypotheses concerning both the regional as well as the demographic structure of regional labour market problems in the EU27. The first is that there may be substantial differences between the NMS12 and the EU15. In particular male workers should have worse labour market outcomes in the NMS12 than in the EU15, and long term unemployment should be a more serious problem. Another is that differences in institutions across countries should increase regional disparities in the EU in particular for those demographic groups where they most strongly affect labour market outcomes. In this section we use descriptive data analysis both on a national as well as a regional level to consider how well our data fits these hypotheses, and to what degree the enlargements changed the regional distribution of labour market indicators in the EU27. We use data from Eurostat on 258 NUTS2 regions[1] of the EU 27 on employment and participations rates by gender and age groups from 2004 to 2006 to discuss these hypotheses. To augment our data with information on unemployment, we calculate the unemployment rate for each of these groups by using the definition $ur_{ijkt} = (1 - er_{ijkt} / pr_{ijkt}) * 100$ (see Perugini and Signorelli (2007) for a derivation) where er_{ijkt} is the employment rate of region i, age group j, gender k and time period t, pr_{ijkt} is the participation rate of the same subgroup and ur_{ijkt} is the unemployment rate. We thus have data on gender specific employment, unemployment and participation rates for the 15-24, 25-34, 35-44, 45-54 and 55-64 year olds. Including the total employment, participation and unemployment rates by age group and in aggregate we thus end up with 18 indicators of the labour market situation, to which we add the share of total long term unemployment in total unemployment, (which is not available on a disaggregation by age and gender but included mome the less on account of its primary importance for the

[1] We exclude the French overseas territories and the Spanish regions of Ceuta and Melila due to missing data problems and indicators for those aged 65 and older due the low reliability of these data for almost all regions. NUTS2 data is used due to the pivotal role of NUTS2 regions for EU regional policy and its use in many regional labour market studies for the EU (Taylor and Bradley, 1997, Basil, Kostoris and Schioppa, 2002, Overmann and Puga, 2002, Boldrin and Canova, 2001).

assessment of the overall labour market situation, see: Mosley and Mayer, 1999). Relative to other researchers we thus use a larger number of indicators.[2] This reflects our particular aim to focus on regional disparities in the structure of labour market outcomes.

3.1. National differences in labour market situation

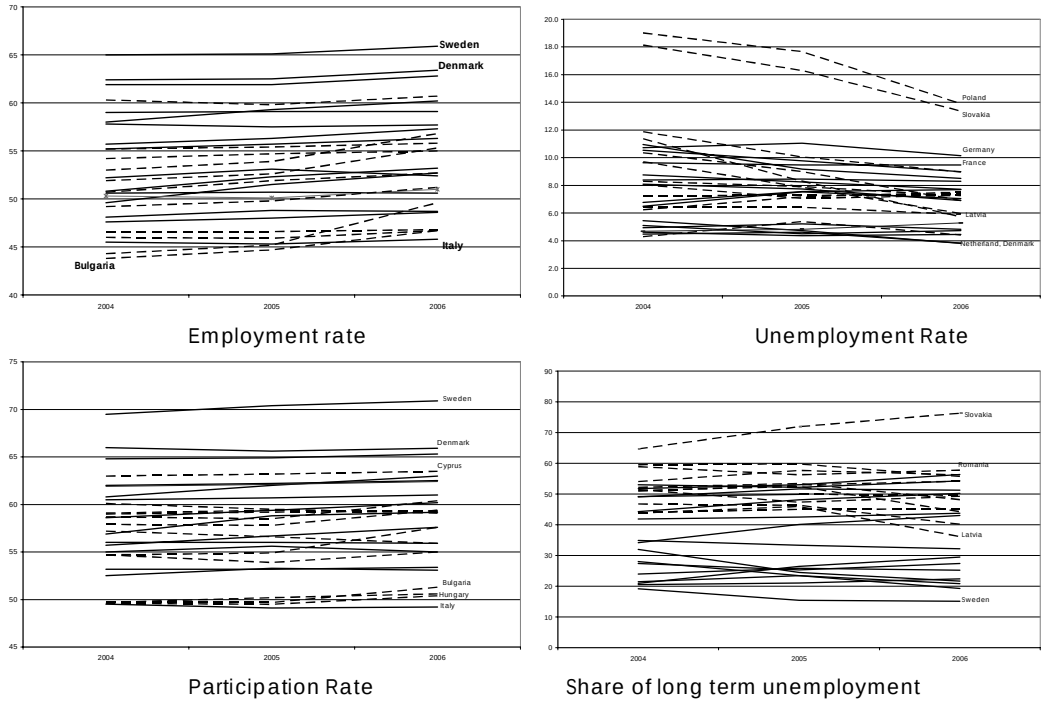
Figure 1 displays national employment, unemployment and participation rates as well as the national share of long term unemployment in total unemployment in the time period from 2004 to 2006 with the NMS12 countries marked by dotted and the EU15 countries by full lines. In particular in the year 2006 the EU27 experienced a positive labour market development, with employment rates increasing in almost all countries and unemployment rates declining. Furthermore, there is also substantial heterogeneity in labour market conditions among the EU27. In 2006 the country with the highest employment rate was Sweden (65.9%) and the country with the lowest was Italy (45.8%). Sweden was also the country with the highest participation rate (70.9%) and Italy again had the lowest (49.2%). Two countries (Poland – 13.9% and Slovakia – 13.4%), despite strong declines, were outliers with respect to unemployment rates, while the Netherlands and Denmark were the countries with the lowest unemployment rates (3.8% each). Finally, the share of long term unemployed in total unemployment was highest (and increased from 2004 to 2006) in Slovakia (76%) and was lowest in Sweden (15.5%)

Explanations, which assume that this heterogeneity is due solely to differences between the NMS12 and the EU15, seem to be to simple, however. Employment and participation rates in the NMS12 are well within the range of the EU15, although they tend to be at the lower end of the distribution. The highest employment and participation rates among the CEEC of the NMS12 are found in Estonia (56.8% and 60.4%, respectively), which is the 9th rank among the EU27. The countries with the lowest employment rates among the CEEC of the NMS12 are Bulgaria and Hungary (46.7% and

[2] Mosley and Mayer (1999), benchmark the labour market situation in the EU using the unemployment rate, the male and female unemployment rates as well as both the share of long term unemployed and the youth unemployment rate, on the grounds that these are closely related to the goal structure of the European Employment Strategy. Amendola, Caroleo and Coppola (2006) use population density as well as activity, employment, long term unemployment rates and sectoral employment shares.

50.6%, respectively), but these still rank better than Italy. With some qualifications the same applies to unemployment rates. Here aside from Poland and Slovakia most of the CEEC range in the middle of the unemployment rate distribution among the EU27, and in Latvia, which had the lowest unemployment rates among the NMS12, unemployment rates were at 5.6% in 2006 (the 7th lowest among the EU27 countries). The data, however, confirm that restructuring has had an important impact on the structure of unemployment in the NMS12. The share of long term unemployed in total unemployment differs most clearly between the EU15 and the NMS12. With respect to this 4 of the NMS12 (Romania, Bulgaria, Slovakia, and Poland) lead the EU27 and all of the NMS12 range in the upper 2/3 of the distribution.

Figure 1: Development of national employment, unemployment and participation rates and shares of long term unemployment in the EU27, 2004 - 2006

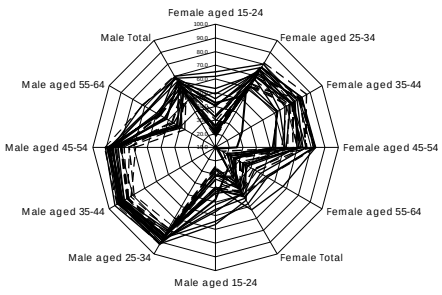


Source: Eurostat, own calculations, dotted lines - NMS 12 countries, full lines – EU15 countries

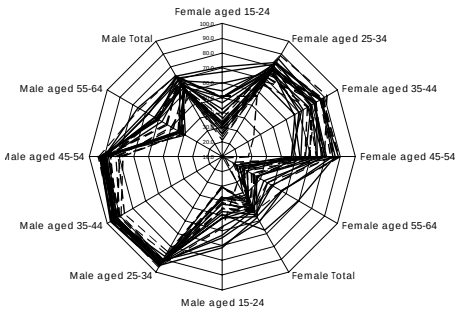
To focus on the more medium term labour market situation in the EU27, for the rest of this paper, we exclusively use (unweighted) averages for the years 2004 to 2006 of the indicators considered. Figure 2 displays these averages at the national level. Once more the NMS12 are represented by dotted lines, while EU15 countries are marked by full lines. Again this figure displays the substantial heterogeneity among the EU27. In

addition, however, it also highlights the stronger impact of industrial decline in the NMS in the last decade. In comparison to the EU15 the NMS12 have particularly low participation rates among the prime working age (i.e. 25 to 54 year old) males, while participation and employment rates of females and the older tend to be more in line with the EU15. With respect to unemployment the high unemployment countries of the NMS12 (Poland and Slovakia) are primarily burdened by high youth unemployment rates.

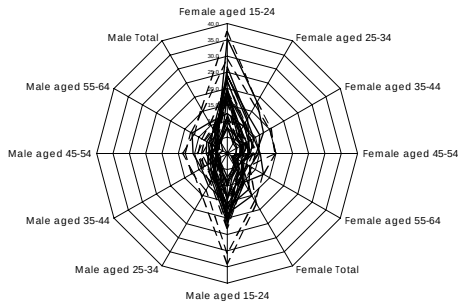
Figure 2: National employment, unemployment and participation rates by age group and gender 2004 - 2006



Employment Rate



Participation Rate



Unemployment Rate

Source: Eurostat, own calculations, dotted lines - NMS 12 countries, full lines – EU15 countries, Figure reports (unweighted) average values for the years 2004 to 2006

3.2. Regional Indicators

Descriptive statistics at the national level thus suggest some differences between the NMS12 and EU15. We are, however, more interested in the regional labour market situation. Two questions that arise in this respect are whether accession of the NMS12 has changed the overall distribution in the EU27 relative to the EU15 and whether the distribution differs among individual subgroups. In table 1 we look at the size of regional disparities (measured by the coefficient of variation) for all indicators analysed for both the EU15 as well as the NMS12. According to these results regional disparities in aggregate employment, unemployment and participation rates are only slightly higher in

the EU15 than in the NMS12, despite the EU15 being composed of a much larger number of regions (203 relative to 55). This suggests that aggregate regional disparities between the EU15 and the NMS12 are by and large comparable.

Table 1: Coefficient of Variation of employment, participation and unemployment rates by gender, age and country group (averages 2004 – 2006)

Gender	Age 15-24	Age 25-34	Age 35-44	Age 45-54	Age 55-64	All age groups
			employment rate			
			EU 27			
Female	0.42	0.13	0.12	0.17	0.36	0.18
Male	0.32	0.07	0.06	0.08	0.22	0.10
Total	0.36	0.09	0.07	0.10	0.26	0.12
			EU15			
Female	0.38	0.13	0.13	0.17	0.33	0.18
Male	0.27	0.07	0.05	0.05	0.20	0.09
Total	0.32	0.09	0.07	0.08	0.24	0.12
			NMS 12			
Female	0.22	0.10	0.11	0.17	0.39	0.12
Male	0.20	0.08	0.07	0.10	0.24	0.11
Total	0.21	0.07	0.07	0.12	0.28	0.10
			Participation rate			
			EU 27			
Female	0.33	0.09	0.11	0.16	0.35	0.14
Male	0.25	0.04	0.03	0.06	0.21	0.07
Total	0.28	0.06	0.06	0.09	0.25	0.10
			EU15			
Female	0.29	0.09	0.11	0.16	0.32	0.15
Male	0.22	0.04	0.02	0.04	0.20	0.07
Total	0.25	0.06	0.05	0.08	0.23	0.10
			NMS 12			
Female	0.17	0.09	0.10	0.15	0.37	0.10
Male	0.15	0.05	0.04	0.08	0.22	0.08
Total	0.16	0.05	0.06	0.10	0.26	0.08
			Unemployment rate			
			EU 27			
Female	0.55	0.59	0.57	0.62	0.83	0.54
Male	0.45	0.55	0.63	0.73	0.76	0.55
Total	0.46	0.53	0.56	0.66	0.77	0.51
			EU15			
Female	0.57	0.63	0.58	0.62	0.88	0.54
Male	0.41	0.56	0.64	0.76	0.82	0.53
Total	0.45	0.54	0.55	0.66	0.84	0.49
			NMS 12			
Female	0.41	0.47	0.50	0.52	0.66	0.48
Male	0.37	0.47	0.47	0.50	0.55	0.46
Total	0.38	0.46	0.47	0.50	0.57	0.46
			Share of long term unemployed			
EU 27						0.38
EU 15						0.40
NMS12						0.18

Source: Eurostat, own calculations Table reports coefficient of variation of (unweighted) average values for the years 2004 to 2006

Table 1, however, also suggests more sizable differences of regional disparities in both the EU15 and NMS 12 with respect to employment, participation and unemployment rates of individual demographic groups. Regional disparities in

participation and employment rates in both the EU15 and NMS12 are about double or three times as high as the average at the two ends of the age distribution (i.e. for the young and the old) and higher for females than for males. The same applies to unemployment rates. Here regional disparities are larger for females than for males and strictly increasing in age (i.e. higher than the average by a factor of 1.5 for the oldest age group). Thus regional labour market disparities among both the EU15 and NMS12 suggest substantial differences in the behaviour of the labour market for women, the young and the older, where in particular for the later two groups (national) institutional differences may play an important role in shaping regional labour market performance.

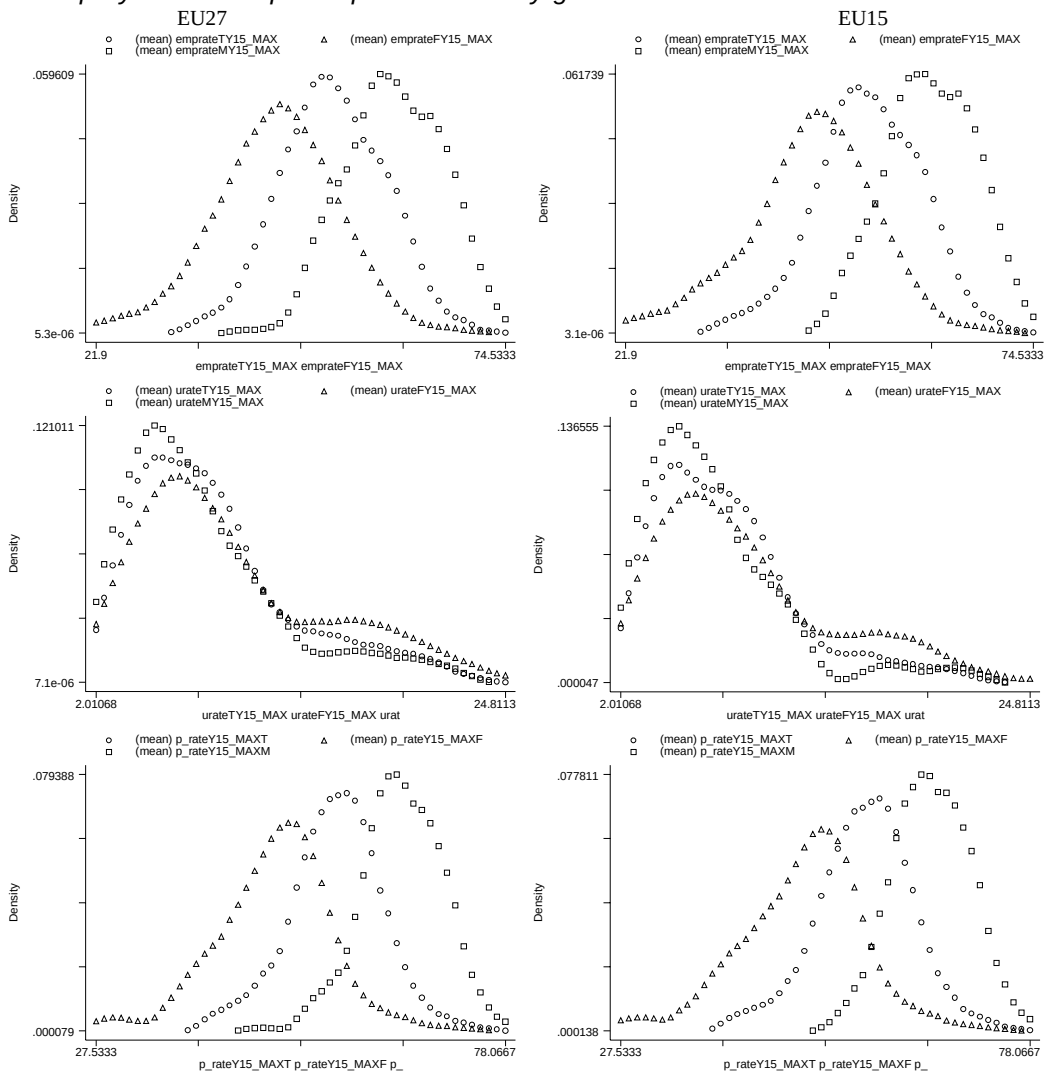
Finally, the impact of the NMS12 on EU27-wide disparities in employment, unemployment and participation rates seems to be limited, since coefficients of variation hardly change relative to the EU15 when considering the EU27. This finding is in stark contrast to results concerning GDP and suggests that differences in employment, participation and unemployment rates between the NMS12 and the EU15 are not large enough any more to cause extreme increases in EU27 disparities.

3.3. Non-Parametric estimates of the distribution of labour market indicators

Focusing exclusively on the coefficient of variation to characterise the distribution of regional labour market problems in the EU27 may, however, be somewhat to simple. A number of recent of contributions (e.g. Overmann and Puga, 2002) stress that issues of regional disparities should be addressed by looking at the complete distribution of indicators across regions, rather than only at first and second moments. This is important because the shape of the distribution provides information on issues such as the share of regions affected by a certain problem and polarisation of regions in different groups. If a substantial part of the mass of a distribution is to the left of the mean (i.e. the distribution is left skewed), this indicates that many regions exhibit values below the average of the relevant indicator and only few above average values. Overman and Puga (2002) show that the distribution of unemployment rates is left skewed and thus high unemployment in the EU15 is concentrated in relatively few regions. Furthermore, looking at complete distributions allows identifying the existence of regional clusters. If the distribution is bipolar, this may be considered a sign of polarisation into high and low

unemployment regions.[3] Again Overmann and Puga (2002) find increasing polarisation in member states.

Figure 3: Kernel density estimates of the regional distribution of employment, unemployment and participation rates by gender



Source: Eurostat, own calculations, Figure is based on average values for 2004 to 2006; Legend: empRateTY15_max=total employment rate, empRateFY15_max=female employment rate, empRateMY15_max=male employment rate, urateTY15_max=total unemployment rate, urateFY15_max=female unemployment rate, urateMY15_max=male employment rate, prateY15_maxT=total participation rate, prateY15_maxF=female participation rate, prateY15_maxM=male participation rate

These findings are mirrored in Figure 3, which presents kernel density estimates of the distribution of male, female and total employment, unemployment and

[3] Pench et al, 1999 argue that this may be a result of the lacking responsiveness of regional wage rates to regional unemployment.

participation rates for the EU27 and the EU15[4]. The participation rate distribution both in the EU27 and the EU15 is left skewed, which implies that there is a large share of regions with participation rates higher than the mean and a small share of regions with low employment rates. Furthermore, at least for males, the distribution of employment rates is bimodal, which suggests the existence two clusters of regions: one with high and one with low participation rates. The distribution of unemployment rates, by contrast, is skewed to the right both in the EU27 and the EU 15 and a small "bump" to the right of the mean typically comprising regions in Southern Spain, Southern Italy, and Eastern Germany (in the case of the EU15) as well as of Poland and Slovakia (in the case of the EU27) indicates a cluster of regions well above the EU average. A second finding derived from figure 3 is that the distribution of regional employment, unemployment and participation rates has not changed dramatically due to the accession of the NMS12. Thus here too differences are not strong enough to lead to visible changes in the distribution of the EU27 relative to the EU15.

4. The differentiation of regional labour market problems in the EU: A principal components analysis

Thus our analysis so far suggests substantial variance in the structure of regional labour market problems in the EU27. Conducting the analysis on the full set of 19 indicators used in this paper, however, leads to difficulties in interpreting results. Thus to uncover the factors underlying heterogeneity, we conducted a factor analysis, in which we included the employment, unemployment and participation rates for males and females by age group as well as the share of long term unemployed.[5] From this analysis we obtain 5 significant factors (table 2). These account for 88% of the total variance in our data. Furthermore, the five significant factors have relatively intuitive interpretations:

[4] Figures A1 to A3 in the appendix present estimates for disaggregate indicators. Interestingly, we find stronger bimodality for the young and the older.We do not separately analyse the distribution for the NMS12 because the low number of regions leads to unreliable results.

[5] We did not include the overall male and female as well as total employment, unemployment and participation rates by age group to avoid multicolinearity among indicators.

Table 2: Factor loadings and descriptive statistics for factors identified in the factor analysis

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
			Employment rates		
Females					
Aged 15-24	-0.17	0.26	**0.88**	0.10	0.28
Aged 25-34	-0.27	**0.69**	**0.50**	0.19	0.01
Aged 35-44	-0.14	**0.95**	0.15	0.05	0.08
Aged 45-54	-0.13	**0.87**	0.17	0.04	**0.33**
Aged 55-64	-0.19	**0.41**	0.20	-0.03	**0.83**
Males					
Aged 15-24	-0.24	0.13	**0.89**	0.20	0.22
Aged 25-34	**-0.68**	0.23	**0.30**	0.37	0.01
Aged 35-44	**-0.66**	0.03	0.13	**0.69**	0.05
Aged 45-54	**-0.58**	0.01	0.18	**0.72**	0.23
Aged 55-64	-0.28	-0.04	0.29	0.20	**0.83**
			Participation rates		
Females					
Aged 15-24	-0.10	0.19	**0.88**	0.07	0.32
Aged 25-34	0.06	**0.65**	**0.34**	0.23	-0.05
Aged 35-44	0.23	**0.93**	0.00	0.05	0.02
Aged 45-54	0.17	**0.89**	0.12	0.05	0.28
Aged 55-64	-0.04	**0.44**	0.22	0.00	**0.82**
Males					
Aged 15-24	-0.10	0.10	**0.91**	0.11	0.26
Aged 25-34	-0.18	0.25	0.17	**0.42**	-0.07
Aged 35-44	-0.01	0.12	0.05	**0.92**	-0.03
Aged 45-54	-0.05	0.13	0.20	**0.89**	0.26
Aged 55-64	-0.06	0.01	0.32	0.22	**0.86**
			Unemployment Rates		
Females					
Aged 15-24	**0.32**	**-0.51**	**-0.64**	-0.21	-0.08
Aged 25-34	**0.59**	**-0.51**	**-0.52**	-0.05	-0.06
Aged 35-44	**0.77**	**-0.39**	**-0.37**	-0.03	-0.12
Aged 45-54	**0.90**	-0.13	-0.20	-0.01	-0.18
Aged 55-64	**0.92**	0.11	0.05	0.15	-0.06
Males					
Aged 15-24	**0.53**	-0.21	**-0.53**	**-0.48**	-0.06
Aged 25-34	**0.86**	-0.15	**-0.30**	-0.23	-0.07
Aged 35-44	**0.92**	0.04	-0.15	-0.26	-0.10
Aged 45-54	**0.93**	0.14	-0.09	-0.20	-0.09
Aged 55-64	**0.95**	0.17	0.03	-0.03	-0.02
			Long term unemploament		
Total	**0.58**	-0.09	**-0.45**	0.02	**-0.32**
			Descriptives		
Lambda	14.0	5.8	2.9	2.7	1.9
Expl.variance	45.1	18.8	9.5	8.6	6.0

Source: Eurostat, own calculations, bold figures highlight factor loadings in excess of 0.3 Lambda = eigenvalue of associated factor,

Factor 1 explains 45% of the variance in the data and is high where unemployment rates (irrespective of the demographic group) and long term unemployment is high, while employment rates are low. This factor is thus closely associated with the overall unemployment and employment situation of a region. The second factor explains a further 19% of the variance and is associated with high female employment and participation rates, while the third factor, which explains about 10% of the variance, is high for regions with high youth employment and participation rates, low

youth unemployment rates and low long term unemployment. It thus measures the labour market situation of youths. The fourth factor, contributing another 9% to the total variance, is particularly high in regions where participation and employment rates of prime age males (i.e. those aged between 25 and 45) are high and the male youth unemployment rate is low. This factor is thus associated with the labour market situation of (prime aged) males. The fifth factor finally, is associated with high participation and employment rates of the elder (i.e. those older than 54).

Table 3: Regression results for regional employment, unemployment and participation rates

	employment rate		participation rate		Unemployment rate	
	B	S.E.	B	S.E.	B	S.E.
Factor 1	-2.60***	0.13	-0.32**	0.15	3.98***	0.02
Factor 2	3.04***	0.13	2.87***	0.15	-0.88***	0.02
Factor 3	3.34***	0.13	2.77***	0.15	-1.38***	0.02
Factor 4	1.16***	0.13	0.75***	0.15	-0.91***	0.02
Factor 5	2.82***	0.13	2.71***	0.15	-0.49***	0.02
Factor 6	1.02***	0.13	1.43***	0.15	0.52***	0.02
Constant	52.32***	0.13	57.18***	0.15	8.66***	0.02
R2	0.87		0.76		0.97	

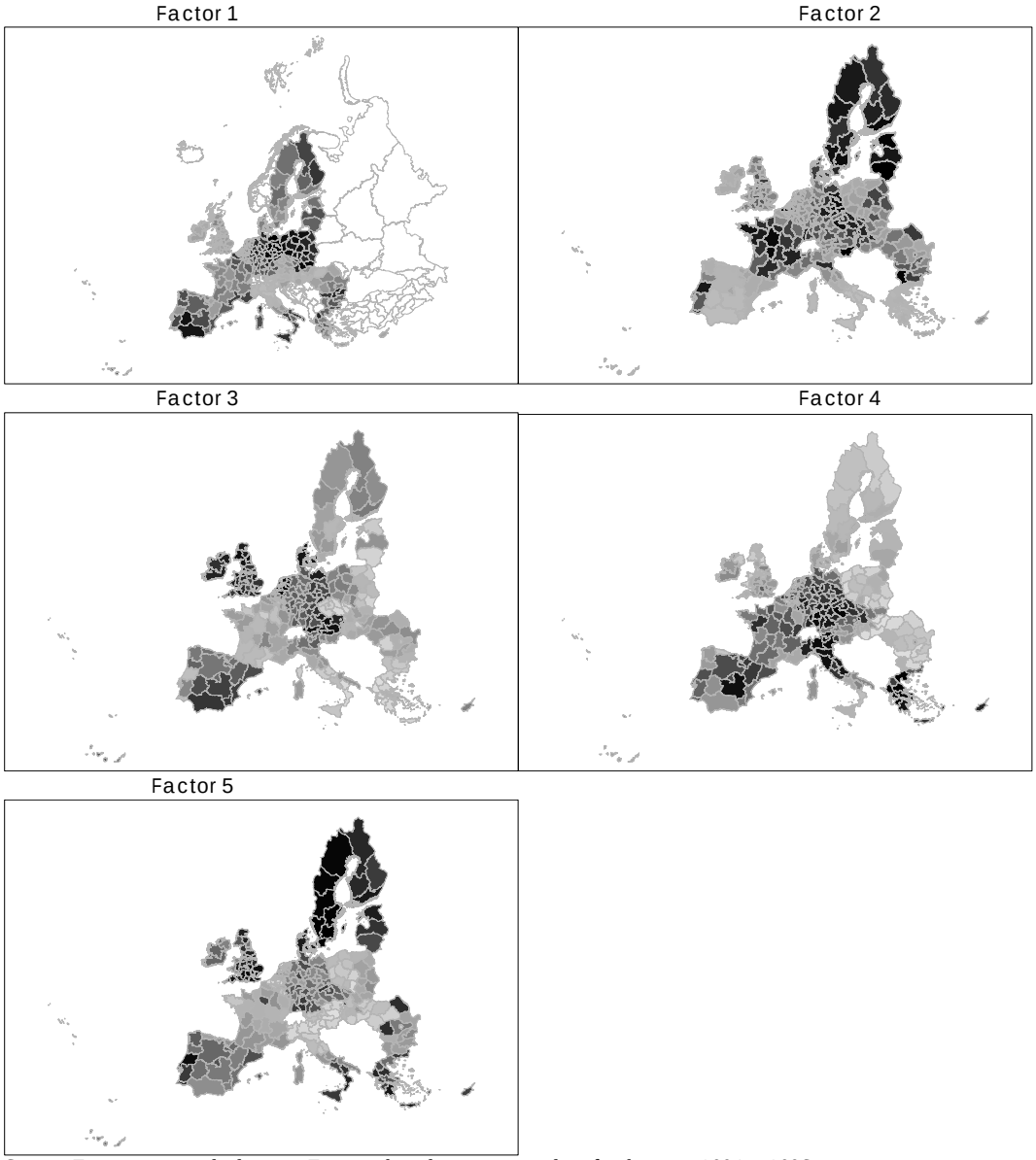
Source: Eurostat, own calculations, B - coefficient estimates, S.E. - Standard Error, *** (**) (*) signify significance at the 1 (5) (10)% level, repectively.

The results of a regression of these factors on aggregate labour market indicators (total employment, unemployment and participation rates) in table 3 are indicative of the explanatory power of structural explanations of regional employment, unemployment and participation rate disparities in the EU. Together the five significant factors explain between 80% to over 90% of the variance in aggregate employment, unemployment and participation rates.[6] Factor 1 is negatively correlated with the aggregate regional employment and participation rates and highly positively correlated with the regional unemployment rates. By contrast all other factors are positively and significantly correlated with total regional employment and participation rates but negatively with unemployment rates. The highest marginal effects on aggregate employment rates are found for factor 3. Here a one standard deviation increase is associated with a ceteris paribus increase in the employment rate of 3.3 percentage points. Factor 2 has the

[6] Note that these aggregate indicators were not included in the factor analysis and that factor scores are orthogonal with mean zero and unit standard deviation, by definition. A unit increase in a factor is thus equivalent to a standard deviation increase.

strongest impact on regional participation rates with a one standard deviation increase increasing the participation rate by 2.9 percentage points. Finally, Factor 1 has the strongest impact on regional unemployment rates. A standard deviation increase in this factor increases regional unemployment by 4 percentage points.

Figure 4: Factor scores of the European NUTS2 Regions



Source: Eurostat, own calculations, Figure is based on average values for the years 2004 to 2006

Factors 1, 2 and 5 also have a strong impact on regional employment rates, while factors 3 and 5 have a strong impact on regional participation rates. The marginal effects of factors 4, by contrast, are the smallest among all factors. This thus suggests that high

unemployment rate regions in the EU27 (i.e. regions with a high score of factor 1) are also regions with low employment and participation rates, while regions with a good labour market situation for females, young and the elder (i.e. high factor scores for factors 2, 3 and 5) also have high aggregate employment and participation rates, but low unemployment rates.

Figure 4 shows the factor score in the form of maps. It reconfirms the descriptive analysis in section 3. Low unemployment rate regions (i.e. regions with a low score of factor 1) are mainly located in Austria, the Czech Republic, the UK and northern Italy, while the high unemployment regions are in Poland, Slovakia, Germany and in southern Italy. By contrast many southern European regions have low female employment rates (i.e. low scores for factor 2) and northern European regions have female labour market participation rates. The NMS12 regions but also many French regions have a low score for factor 3, which suggests that youth labour market problems are important. High scores in terms of factor 3 – indicating a favourable youth labour market situation - are attained in Germany, the UK and Austria. Similarly high scores of factor 4 (indicating a favourable labour market situation of males) are primarily obtained in Austria, Northern Italy and Germany, while the NMS have very low scores in this respect. In addition, regions with a good labour market situation for the elder (high score of factor 5) are primarily in Northern Europe, while Nothern Italy, Austria and many of the NMS12 have low scores.

5. Do the New Member States Differ from the EU15?

5.1. ANOVA Results

A further question we set out to address is to what extent NMS12 regions differ from the EU15 in their labour market outcomes. A number of pre-accession studies find that national labour market outcomes in the CEEC of the NMS12 do not differ dramatically from those in the EU15. For instance Knogler (2001) concludes that in 1998 the CEEC did not perform worse than many EU15 countries concerning most indicators and outperformed most of the EU15 with respect to gender differences in unemployment and employment rates. Similarly, Huber (2003) concludes that most indicators of labour market development in the NMS12 are within the range of the EU15. With regional data we are able to test these hypotheses more formally. We conduct a series of ANOVA tests of the hypothesis that average employment, unemployment and participation rates in the

NMS12 do not differ significantly from the EU15 for each of the indicators as well as for the five principal components derived in the last section. Furthermore, since as shown in section 1 there is also substantial heterogeneity among both EU27 as well as NMS12 countries we ran regressions of regional indicators on a set of country dummies to examine how much of the regional variation can be explained by national differences.

Results (in table 4) suggest that the average unemployment rates in NMS12 regions were significantly higher for almost all subgroups (except for the elder) while employment and participation rates were lower. The only exception to this is the participation rate of prime aged (35 to 54 of age) females, which is significantly higher in the NMS12. When, however, conducting the same analysis on the factor scores we find significant differences between the NMS12 and the EU15 only with respect to factors 2 to 5 (i.e. those most strongly associated with the labour market situation of the females, young males and the older). Thus in particular the structure of regional labour markets differs between the NMS12 and the EU15, where - as already found in the descriptive analysis - the NMS12 have a significantly worse situation with respect to the labour market situation of males, young and elder (factors 3, 4 and 5), but in average perform better in average with respect to females (factor 2).

The results, however, also suggest that for most indicators, regression models, in which regional employment, unemployment and participation rates are regressed on a dummy for regions in the NMS12, explain only very little of the variation. The R^2 values of these regressions (columns labelled EU-R2 in table 4) mostly explain less than 10% of the variance. The only case where a dummy for the NMS12 explains more than 15% of the regional variance is with respect to factors 3 and 4 (i.e. factors associated with the youth and the male labour markets) of the principle components analysis. While in particular this last result confirms some of our hypothesis with respect to the potential differences in the labour market situation between the NMS12 and EU15, we conclude that simple East-West explanations of regional differences in labour market conditions only have a low explicative power and are not able to explain the large variance in regional labour market indicators within the EU27.

Table 4: Results of Anova tests for differences in regional employment, unemployment and participation rates by age and gender

	EU 15	NMS 12	EU27	Sign	EU-R2	N-R2	EU 15	NMS 12	EU27	Sign	EU-R2	N-R2	EU 15	NMS 12	EU27	Sign	EU-R2	N-R2
	Unemployment						Participation						Employment					
Females																		
15-24	20.1	25.2	21.2	***	0.03	0.57	44.9	28.9	41.6	***	0.22	0.89	37.1	21.5	33.9	***	0.18	0.87
25-34	10.6	13.0	11.1	**	0.02	0.51	49.9	47.2	49.3	**	0.02	0.75	43.4	27.6	40.1	***	0.23	0.8
35-44	8.3	10.5	8.8	***	0.03	0.49	76.8	72.5	75.9	***	0.05	0.42	40.3	24.6	37.0	***	0.21	0.85
45-54	6.8	10.1	7.5	***	0.07	0.54	77.8	81.8	78.6	***	0.03	0.58	45.3	41.4	44.5	***	0.04	0.71
55-64	5.9	6.6	6.0		0.003	0.54	72.6	74.4	72.9		0.004	0.75	61.0	56.0	60.0	***	0.1	0.62
All ages	9.7	12.2	10.2	***	0.03	0.52	81.6	78.9	81.0	**	0.02	0.65	2.5	4.0	2.8	***	0.02	0.52
Males																		
15-24	17.2	25.4	18.9	***	0.13	0.45	2.4	4.0	2.8	***	0.04	0.52	69.0	62.9	67.7	***	0.06	0.43
25-34	8.2	10.4	8.6	**	0.03	0.45	51.7	37.1	48.6	***	0.22	0.83	84.4	81.6	83.8	***	0.03	0.38
35-44	5.7	8.5	6.3	***	0.07	0.48	65.9	62.9	65.3	***	0.06	0.68	76.7	72.4	75.8	***	0.05	0.35
45-54	5.4	9.2	6.2	***	0.11	0.54	91.8	91.1	91.7		0.004	0.42	71.5	73.1	71.9		0.005	0.5
55-64	5.8	7.9	6.3	***	0.03	0.55	94.4	91.8	93.9	***	0.09	0.48	89.1	84.0	88.0	***	0.13	0.38
All ages	7.5	10.9	8.2	***	0.08	0.49	47.4	37.6	45.3	***	0.12	0.82	6.2	7.8	6.5	**	0.01	0.61
Total																		
15-24	18.4	25.3	19.9	***	0.08	0.51	57.2	49.1	55.5	***	0.08	0.78	67.7	67.0	67.6		0.001	0.71
25-34	9.2	11.6	9.7	***	0.03	0.47	6.2	7.9	6.6	**	0.02	0.61	85.7	75.9	83.7	***	0.3	0.52
35-44	6.8	9.4	7.3	***	0.06	0.47	48.4	33.0	45.2	***	0.22	0.88	76.7	71.4	75.6	***	0.08	0.56
45-54	5.9	9.6	6.7	***	0.11	0.56	57.7	54.7	57.1	***	0.05	0.72	35.6	25.8	33.5	***	0.11	0.79
55-64	5.8	7.4	6.1	**	0.02	0.58	84.3	81.9	83.8	***	0.03	0.38	53.9	45.5	52.1	***	0.08	0.74
All ages	8.4	11.5	9.0	***	0.07	0.48	4.1	5.5	4.4	**	0.02	0.57	4.0	5.4	4.3	**	0.02	0.57
							Aggregate Indicators											
LTU													37.5	53.6	40.8	***	0.16	0.71
Factor1													0.22	-0.06	0.00	*	0.01	0.57
Factor 2													0.28	-0.08	0.00	**	0.02	0.60
Factor 3													-0.79	0.21	0.00	***	0.17	0.87
Factor 4													-0.81	0.22	0.00	***	0.18	0.69
Factor 5													-0.47	0.13	0.00	***	0.06	0.74

Source: Eurostat, own calculations, table is based on average values for the years 2004 to 2006, Columns labelled sign report the significance of a dummy variable for NMS12 member states with *** (**) (*) signifying significance at the 1 (5) (10)% level respectively, columns labelled EU-R2 report the R^2 value of this regression, columns labelled N-R2 report the R^2 values of a regression on national dummies, other columns report (unweighted) means for the respective subgroup, LTU= share of long term unemployed in total employment.

National explanations seem to be more important. The R^2 values of running regressions on national dummies (columns labelled N-R2 in table 4) indicate that for most subgroups over 40% of the variance of individual indicators and more than 50% of the variance in factor scores can be explained by national dummies. Thus national (institutional) factors are of primary importance when considering regional labour market disparities in the EU27. Furthermore, for participation and employment rates of the young and the older more than 80% of the variation can be explained by national dummies and R^2 values of national dummies are highest for factor 3 and 5 (i.e. those associated with the labour market situation of the young and the elder). Thus, as expected, national factors are most important in explaining regional labour market disparities in labour market segments that may be considered most strongly affected by national institutions.

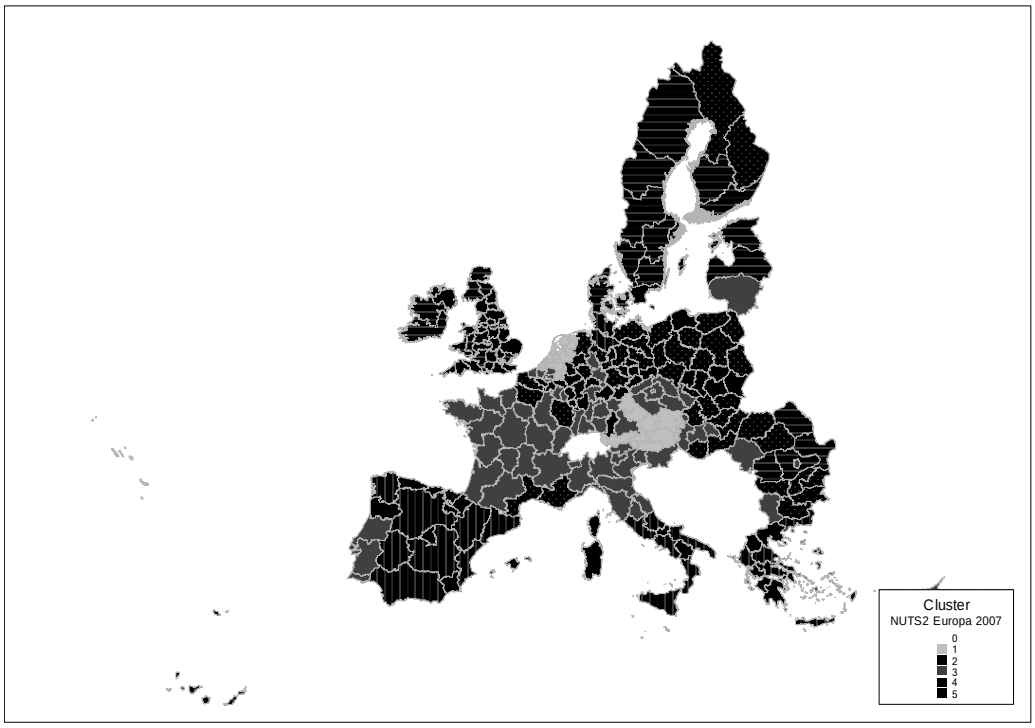
5.2. Cluster Analysis

While differences between the NMS12 and the EU15 are thus important, national differences seem to be more important in particular when considering the labour market situation of the young and the old. These findings, however, tend to mask the substantial heterogeneity within both the EU15 and NMS12. A potential shortcoming of the above analysis is that there may be a number of regions characterised by similar labour market problems located in different countries. To analyse this issue we performed a cluster analysis using the factor scores of the principle components of the last section as cluster variables. Furthermore, we use correlation coefficients as distance measures and average within group linkage to define groups. To decide on the number of clusters reported we look at the distance between the two merged clusters. We decided for 5 groups to avoid an excessive amount of groups. Table 5 and figure 6 display the characteristics of the members of these groups; figure 5 shows the geographic location of cluster members.

The findings suggest that the CEEC among the NMS12 are not characterised by completely different regional labour market problems than the EU15. The cluster where most of the NMS12 regions can be found is cluster 2, which is marked by high scores of factor 1, the lowest average employment and participation rates and the highest total unemployment rates among all clusters. Furthermore, in terms of the structure of employment, unemployment and participation rates this cluster has the highest unemployment rates and relatively low employment rates for most groups, while participation rates are more in line with the average. Aside from regions of the NMS12 in

Poland, Slovakia and Eastern Hungary this cluster draws its membership from 32 EU15 regions, which are mostly located in Germany and France. Thus these regions are the most comparable to NMS12 regions.

Figure 5: Cluster membership of European NUTS2 regions



Source: Eurostat, own calculations

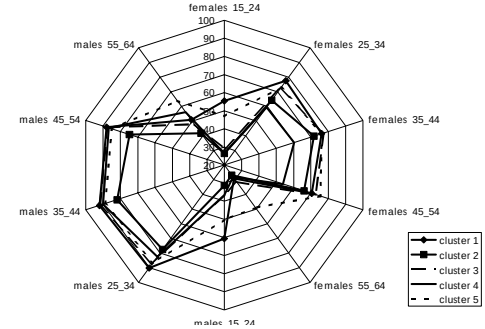
Further clusters where NMS regions are represented to a significant degree are clusters 3 and 5. The Czech as well as some Western Hungarian and Slovak regions are grouped into cluster 3. This comprises the low unemployment rate regions in Northern Italy, Southern Germany and France. It has aggregate employment and participation rates in the middle ranges of the EU27 distribution and also performs average with respect to the demographic structure of employment, unemployment and participation rates. Cluster 5, by contrast, which also encompasses some Romanian regions and two Baltic countries may otherwise be considered a cluster of the northern labour markets of Sweden, Denmark and Great Britain. This cluster has the second lowest unemployment rates and high employment and participation rates. In addition, here the employment rate of the older and (to a lesser degree) of women is particularly high.

Table 5: Group means and summary Statistics of clusters (aggregate indicators)

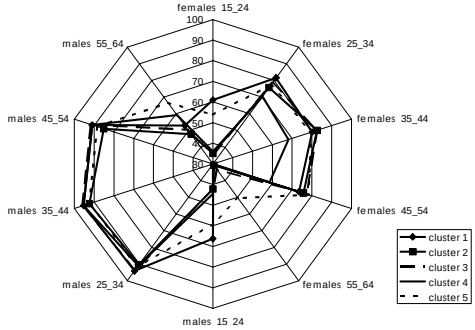
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Employment rate					
Femlae	51.0	41.0	45.5	36.5	52.8
Malep	67.0	53.3	60.7	59.6	64.7
Total	58.8	46.9	52.8	47.8	58.5
Participation Rate					
Female	53.9	48.1	49.2	42.0	55.8
Male	70.0	62.0	64.4	64.3	68.7
Total	61.8	54.8	56.5	52.9	62.0
Unemployment Rate					
Female	5.4	14.6	7.5	13.6	5.4
Male	4.3	14.0	5.8	7.4	5.9
Total	4.8	14.3	6.6	9.8	5.6
Share of long term unempl.	33.7	54.7	41.1	42.8	25.1
			Number of regions from…		
NMS		31	17	1	6
EU27	25	32	48	47	53

Source: Eurostat, own calculations

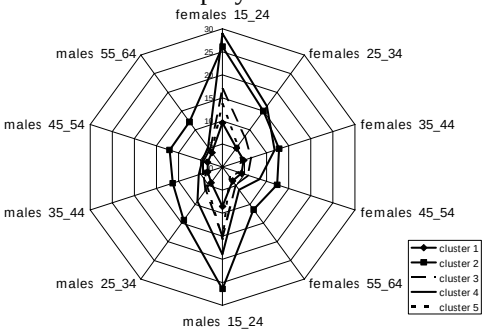
Figure 6: Group means of clusters (disaggregate indicators)



Employment Rate



Participation Rate



Unemployment Rate

Source: Eurostat, own calculations

In consequence our analysis suggests that southern European labour markets, which have often been viewed as the most comparable to the NMS12 on account of their high unemployment rates, may not be the best comparison group. The southern European regions of Italy, Spain and Greece are put in Cluster 4. Of the NMS12 only Malta belongs

to this cluster. This cluster is also characterised by high unemployment rates, high shares of long term unemployment and low participation and employment rates. It, however, differs from cluster 2 by high gender differences in employment, unemployment and participation rates. Finally, a cluster where none of the NMS12 regions are grouped is cluster 1 which collects the low unemployment regions of primarily Austria and the Netherlands. Here aside from low unemployment rates low youth unemployment rates but also low participation rates of the older, prevail.

6. Regression Analysis

A final hypothesis we want to address is that regional labour market problems may be correlated with different variables in different parts of Europe. In particular we hypothesised that due to higher industrial restructuring in the CEEC among the NMS12, industrial structure and structural change may be more important correlates of regional labour market outcomes in the NMS12. In this section we use regression analysis to address this issue. In his survey Elhorst (2003) suggests that the variables most often found to be significant determinants of the regional unemployment rate are: the age structure of the population, the educational attainment of the population, the participation rate, employment growth, the share of persons living in the public rental sector, social security and minimum wage levels, amenities, wages, productivity, vacancy rates, market potential as well as the national unemployment rates and the share of long term unemployed.

Of these we were able to obtain (from EUROSTAT sources): the share of less educated (i.e. ISCED levels below 2) and the share of the highly educated (ISCED 5 or 6) in active age population, the share of the population aged 25 or older in active aged population, indicators of the structure of employment[1], an indicator of structural change[2], total employment growth in the period 2004-2006, average wages (compensation per employee), productivity (GDP at PPP per employee), the share of long term unemployed

[1] These are the share of employees in agriculture (NACE A&B), construction (NACE F), Wholesale trade and restaurants (NACE G,H & I), financial intermediation and real estate (J and K) and other services (NACE L to Q))

[2] This is measured as the sum of absolute employment share changes in the period 2004 to 2006 across the sectors mentioned

and the participation rate. In addition we also include country fixed effects to account for national institutions (such as the generosity of social security system, minimum wages and national labour market regulations) as well as the national labour market situation (such as national unemployment rates).

Table 6: Regression results for regional unemployment rates

	All	NMS	EU15	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Ln(low	0.074	0.278	-0.086	-0.637	0.111	0.580*	0.400	-0.956***
education share)	(0.111)	(0.200)	(0.141)	(0.649)	(0.030)	(0.288)	(0.250)	(0.323)
Ln(high	-0.096	-0.303	-0.078	-2.488	0.488	-0.070	-0.762***	-0.728*
education share)	(0.171)	(0.339)	(0.197)	(1.657)	(0.297)	(0.324)	(0.268)	(0.388)
Ln(share of	-2.890***	-4.520*	-4.473***	-4.543	-2.268	-0.100	0.534	-1.741
population above 25)	1.216	(2.426)	(1.358)	(7.818)	(2.011)	(2.200)	(2.098)	(2.380)
Ln(agricultral	-0.126***	-0.130	-0.077	-0.462	-0.264***	-0.025	-0.040	-0.093*
employment share)	0.048	(0.097)	(0.051)	(0.261)	(0.058)	(0.065)	(0.066)	(0.050)
Ln(other service	0.409*	0.972*	0.443*	1.065	1.055***	0.406	0.277	-0.528
employment share)	0.209	(0.538)	(0.231)	(1.149)	(0.360)	(0.271)	(0.273)	(0.504)
Ln(construction	0.258**	0.392*	0.346**	-0.156	0.247*	-0.317	0.197	0.447**
employment share)	0.111	(0.229)	(0.142)	(0.430)	(0.138)	(0.243)	(0.254)	(0.191)
Ln(trade & restaurants	0.121	0.040	0.240	-0.133	0.327	0.022	0.214	-0.552
emlpoyment share)	0.195	(0.421)	(0.222)	(1.021)	(0.349)	(0.249)	(0.293)	(0.335)
Ln(financial &real est.	0.122	-0.070	0.280*	0.702	-0.554**	0.225	0.248	0.169
employment share)	0.122	(0.187)	(0.146)	(0.564)	(0.202)	(0.215)	(0.264)	(0.173)
Ln(employment	-0.219	1.084	-0.371	-2.080	0.164	0.234	-1.244	0.568
growth)	0.429	(1.001)	(0.509)	(4.093)	(0.635)	(0.680)	(1.027)	(0.896)
Ln(structural change)	-0.039	**0.097**	-0.044	-0.160	0.003	0.022	-0.075*	-0.061
	0.032	(0.064)	(0.037)	(0.136)	(0.039)	(0.093)	(0.043)	(0.077)
Ln(productivity)	-0.071	-0.151	-0.235	-0.171	0.417	-0.775	-0.356	-1.465**
	0.305	(0.911)	(0.337)	(0.792)	(0.454)	(0.667)	(0.400)	(0.628)
Ln(wages)	-0.339	-0.104	0.065	-0.166	-0.555	0.373	0.361	1.651***
	0.351	(1.061)	(0.416)	(1.028)	(0.466)	(0.741)	(0.668)	(0.551)
Ln(long term	0.850***	0.887***	0.797***	0.439	0.601**	0.589***	0.488***	0.450***
unemployment share	0.130	(0.311)	(0.129)	(0.423)	(0.237)	(0.206)	(0.140)	(0.151)
Ln(aggregate	-1.147**	-1.723*	-1.400**	-0.559	1.262*	-1.461	-1.483	-1.139
participation rate)	0.499	(0.992)	(0.575)	(2.597)	(0.702)	(0.992)	(0.643)	(0.745)
No. observations	257	55	202	25	60	65	48	55
R2	0.83	0.93	0.81	0.91	0.89	0.87	0.83	0.88

Source: Eurostat, own calculations, dependent variable: ln(unemployment rate), values in brackets are heteroskedasticity robust standard errors, *** (**) (*) signify significance at the 1 (5) (10)% level respectively, bold figures report a significant (at the 5% level) difference of coefficient estimates between the NMS12 and the EU15, regression includes country dummies, which are not reported

Table 6 presents the results of regressing the 2004 to 2006 average of (the log of) these indicators on the average (log of the) aggregate regional unemployment rate for the same time period, The second column presents results for the full sample, while columns 3 and 4 present results for the NMS12 and the EU15 and the remaining columns report results for each of the five clusters. A number of results stick out. First R^2 values are above 0.80; relative to the ANOVA results of section 4 this represents an improvement of 30 percentage points. Thus aside from national factors, regional developments are also an important determinant of the regional labour market situation. Second, when considering the significant variables, in the EU27, EU15 and NMS samples the share of long term

unemployed, the share of the active aged population above 25, sectoral employment shares and participation rates are the significant correlates of regional unemployment rates. Among these variables a higher share of over 25 year olds and higher participation rates have the strongest negative impact, while a higher share of the long term unemployed increases regional unemployment rates. Sectoral employment shares by contrast are only on the margin of significance or not robust, only the share of construction in employment unambiguously increases regional unemployment rates, which is probably due to higher seasonal unemployment in regions with a high share of construction employment.

Third the results suggest only few differences in the correlates of unemployment rates between EU15 and NMS12. The only variable for which coefficient estimates for the EU15 and NMS12 sample differ significantly, is the indicator of sectoral structural change. Here point estimates suggest a small positive impact in the NMS12 but a negative one in the EU15, both coefficients are, however, individually insignificant. Thus our hypothesis that initial industrial structure and structural change have a stronger impact on the regional labour market situation in the NMS12 and EU15 finds at least some limited support. Differences in the determinants of regional unemployment rates among the clusters defined in the last section, by contrast, seem to be slightly higher. In particular for cluster five (i.e. the cluster of southern European regions) educational attainment and wages are a significantly more important determinant of the regional unemployment rate than elsewhere and for Cluster 4 (i.e. the northern European Labour markets) educational attainment is more important.

As a further experiment we also regressed the (log of the) aggregate regional employment rate on the same set of variables. Results of this regression (in table 7) largely accord with those for unemployment rates. Aside from national determinants, regional factors are also an important determinant of regional employment rates. The R^2 values in this specification are by 20 percentage points higher than those in the model of section 4, where only national dummies were included. The share of long term unemployed, participation rates and the share of the population older than 25 in the total active population are the most important determinants of employment rates, with parameters (as expected) oppositely signed to those for unemployment rates. In addition here too differences for the NMS and the EU15 pertain only to the impact of structural

change on the employment rate (which is negative but insignificant for the NMS12 and positive but insignificant for the EU15) and education and wages seem to have a significant impact only in cluster 5 (i.e. the southern European labour markets) and education is more important in cluster 4 (i.e. northern Europe).

Table 7: Regression results for regional employment rates

	All	NMS12	EU15	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Ln(low	0.001	-0.035	0.021	0.031	-0.004	-0.045	-0.039	0.058***
education share)	(0.014)	(0.028)	(0.017)	(0.034)	(0.018)	(0.032)	(0.035)	(0.019)
Ln(high	0.007	0.009	0.001	0.141	-0.061	0.019	0.086**	0.039*
education share)	(0.019)	(0.043)	(0.022)	(0.088)	(0.053)	(0.027)	(0.034)	(0.023)
Ln(share of	0.280*	0.561*	0.478***	0.217	0.400	0.014	0.079	0.027
population above 25)	(0.147)	(0.321)	(0.163)	(0.379)	(0.363)	(0.167)	(0.275)	(0.148)
Ln(agricultral	0.011**	0.028**	0.003	0.024	0.044***	0.001	0.002	0.003
employment share)	(0.005)	(0.013)	(0.005)	(0.014)	(0.011)	(0.005)	(0.008)	(0.003)
Ln(other service	-0.061**	-0.178**	-0.062**	-0.058	-0.193***	-0.050**	-0.041	0.045
employment share)	(0.024)	(0.076)	(0.026)	(0.062)	(0.064)	(0.021)	(0.035)	(0.028)
Ln(construction	-0.038***	-0.074**	-0.047***	0.004	-0.046**	0.026	-0.023	-0.029**
employment share)	(0.012)	(0.031)	(0.015)	(0.021)	(0.022)	(0.017)	(0.035)	(0.011)
Ln(trade & restaurants	-0.021	0.009	-0.035	0.002	-0.066	-0.007	-0.011	0.036
emlpoyment share)	(0.019)	(0.049)	(0.021)	(0.056)	(0.060)	(0.019)	(0.041)	(0.020)
Ln(financial &real est.	-0.001	0.037	-0.022	-0.042	0.083**	-0.015	-0.025	-0.012
employment share)	(0.013)	(0.025)	(0.015)	(0.035)	(0.036)	(0.017)	(0.033)	(0.010)
Ln(employment	0.015	-0.089	0.018	0.034	-0.043	-0.002	0.156	-0.050
growth)	(0.055)	(0.173)	(0.059)	(0.219)	(0.121)	(0.052)	(0.129)	(0.051)
Ln(structural change)	0.005	**-0.007**	0.005	0.008	0.000	-0.002	0.009	0.004
	(0.004)	(0.008)	(0.004)	(0.008)	(0.007)	(0.007)	(0.005)	(0.004)
Ln(productivity)	0.011	-0.123	0.043	0.001	-0.064	0.050	0.041	0.087**
	(0.031)	(0.089)	(0.033)	(0.041)	(0.074)	(0.049)	(0.052)	(0.039)
Ln(wages)	0.025	0.162	-0.038	0.002	0.093	-0.036	-0.067	-0.102***
	(0.035)	(0.108)	(0.039)	(0.056)	(0.078)	(0.058)	(0.094)	(0.034)
Ln(long term	-0.074***	-0.108**	-0.066***	-0.024	-0.095***	-0.043**	-0.044**	-0.021**
unemployment share	(0.014)	(0.040)	(0.013)	(0.022)	(0.041)	(0.017)	(0.017)	(0.008)
Ln(aggregate	1.053***	1.060**	1.087***	1.041***	0.775***	1.046	1.174***	1.106***
participation rate)	(0.055)	(0.135)	(0.062)	(0.139)	(0.121)	(0.081)	(0.085)	(0.043)
No. observations	257	55	202	25	60	65	48	59
R2	0.970	0.980	0.960	0.980	0.940	0.980	0.980	0.980

Source: Eurostat, own calculations, dependent variable: ln(employment rate), values in brackets are heterosjedasticity robust standard errors, *** (**) (*) signify significance at the 1 (5) (10)% level respectively, bold figures report a significant (at the 5% level) difference of coefficient estimates between the NMS12 and the EU15, regression includes country dummies, which are not reported

Finally, tables A1 to A4 in the appendix present results for unemployment and employment rates of the young (15-24 year olds), the older (55-64 year olds) as well as males and females as dependent variables. While the results for unemployment rates (tables A1 and A2) are quite similar to those for aggregate unemployment rates, for employment rates (tables A3 and A4) we find some variation. In particular educational attainment is a more important determinant for participation of all groups (where interstingly the coefficients are oppositely signed for young and the older) and differences in the correlates of male regional employment rates between the NMS12 and the EU15

are more significant than for aggregate employment rates (with - as hypothesized – sectoral employment shares being more important in the NMS).

Thus we conclude that aside from national factors explaining regional unemployment rates, regional correlates (of which the age structure of the population, long term unemployment, participation and sectoral employment shares are the most important) contribute a substantial part to the explanation for differences in aggregate regional employment and unemployment rates in the EU27, and that differences in these correlates between the EU15 and the NMS12 on aggregate indicators – with the potential exception of the impact of structural change - are mostly insignificant, but that there may be some differences between clusters, in particular when considering the cluster of southern European labour markets and that there may be more significant differences in the correlates of the structure of regional employment rates beween the EU15 and the NMS12 in particular for male employment rates.

7. Conclusions

In this paper we argue that the literature on regional labour market development, leads to a number of hypotheses with respect to the regional and demographic structure of labour market problems in an enlarged EU. We also argue that these factors are linked and present evidence which indicates that looking at the structure of regional labour market problems is important. We find that regional disparities in employment, unemployment and participation rates are of a different order of magnitude for individual labour market groups than for the overall aggregates and that a factor analysis based on indicators of the structure of regional employment, unemployment and participation rates can explain between 80% and more than 90% of the variance in aggregate employment, unemployment and participation rates in the EU27.

In addition, we find significant differences between the NMS12 and the EU15. In particular both national and regional data indicate that the NMS12 have higher long-term unemployment shares as well as lower employment and participation rates of males and higher youth youth unemployment rates than the EU15. We, however also show that simple East-West explanations of regional labour market disparities can rarely explain more than 10% of the EU-wide variance in the 19 regional labour market indicators considered and both the results of cluster and factor analyses suggest substantial similarities between the labour markets of individual NMS12 and EU15 regions. In

particular the labour markets of Poland and Slovakia are most comparable to the high unemployment regions of northern and eastern Germany but less so with the southern European labour markets. We also find that in contrast to income differentials, regional disparities in labour market indicators have not increased dramatically within the EU27 due to enlargement and that the distribution of regional labour market indicators has also not shifted visibly.

We also find that national differences are important (and more so than East –West differences) for explaining regional labour market disparities in the EU15. For most of the indicators used in this paper, national dummies can explain more than 40% of the total regional variance in the EU27. Our results also corroborate the hypotheses that national factors are more important for the young and the older and that for these groups also regional disparities within the EU are largest. At the same time, however, when regressing regional unemployment and employment rates on a number of variables found to be signicant in the literature, we find that regional variables such as the the share of long term unemployed, the share of the older active aged population, the sectoral employment share and the participation rate, are significantly correlated with regional labour market differences even after controlling for national differences. Finally, our regression results provide only little evidence that the determinants of aggregate regional employment and unemployment rates differ starkly between the NMS12 and the EU15 but indicate that educational attainment and wages are more important in the southern European labour markets and that differences between the EU15 and the NMS12 are larger when considering the structure of employment, where the later applies in particular to male employment rates.

In sum our results thus suggest that disparities in regional labour market problems in the EU27 are shaped by an interaction of national factors such as institutions and regional determinants which in addition interact differently for different groups of the labour market. We would thus suggest that future research, which sets out to determine in more detail, how different interactions between national institutions and regional determinants differentially impact on regional labour markets, would be particularly rewarding to get a more complete picture of regional labour market disparities in the EU27. Furthermore, such research could also focus more strongly on the causes of regional disparities for individual demographic groups. Our results suggest that the labour

market for youths and the older could be of particular interest in this respect. In addition one element that is missing from our analysis are differences in the labour market situation of persons with different qualifications. Thus a detailed analysis of regional differences in the labour market situation for different skill groups is also left to future research.

8. Literature

Aghion Philipe, Oliver J. Blanchard (1994) On the Speed of Transition in Central Europe, NBER Macroeconomics annual 1994, 283-320

Amendola, Adalgiso, Floro Ernesto Caroleo, Gianluigi Coppola (2006) Regional Disparities in Europe, in Floro Ernesto Caroleo, Segio Destafinis (Eds), The European Labour Market: Regional Dimmensions, Physica Verlag, Heidelberg, pp. 9-32.

Aumayr, Christine M. (2007) European Region Types in EU-25, European Journal of Comparative Economics, pp. 109-47

Basile, Roberto; Padoa Kostoris, Fiorella Schioppa (2002) Unemployment Dynamics of the 'Mezzogiornos of Europe': Lessons for the Mezzogiorno of Italy, CEPR Discussion Papers: 3594, 2002

Belke, Ansgar, Martin Hebler (2002) EU –Osterweiterung, Euro und Arbeitsmärkte, R. Oldenburg, Munich, Vienna

Boeri, Tito (2000) Structural Change, Welfare Systems, and Labour Reallocation, Lessons from the Transition of Formerly Planned Economies, Oxford University Press, New York.

Boeri, Tito Herbert Brücker, (Eds.) (2000) The Impact of Eastern Enlargement on Employment and Wages in the EU Member States, European Integration Consortium, Deutsches Institut für Wirtschaftsforschung, DIW,

Boldrin, Michele and Fabio Canova (2001) Europe's Regions, Economic Policy, April, pp 205 - 253

Bornhorst F., Commander Simon (2006), Regional Unemployment and its Persistence in Transition Countries, The Economics of Transition, 14: 2, 269 - 288

Burda, Michael (1998) The Consequences of EU – Enlargement for Central and Eastern European Labour Markets, CEPR Discussion Paper No. 1881

Caroleo, Floro Ernesto, Francesco Pastore (2007) A New Regional Geography of Europe? The Labour Market Impact of the EU Enlargements, IZA Discussion Paper 2620,

Elhorst, J Paul (2003) The Mystery of Regional Unemployment Differentials: Theoretical and Empirical Explanations, Journal of Economic Surveys, pp. 709-48

Elhorst, J Paul; Zeilstra, Annette S (2007)Labour Force Participation Rates at the Regional and National Levels of the European Union: An Integrated Analysis, Papers in Regional Science, pp. 525-49

Fazekas, Karoly (1996) Types of Microregions, Dispersion and Local Employment Development in Hungary, Eastern European Economics, pp 3 – 48.

Ferragina A.M., Pastore F. (2005), Regional Unemployment in the OST-Literature, in Caroleo F.E. and Destefanis S. (eds), The European Labour Market – Regional Dimensions, Physika, Heidelberg, New York, 33 - 87

Ferragina A.M., Pastore F. (2007), Mind the Gap Unemployment in the New EU Regions, forthcoming, Journal of Economic Surveys,

Gacs, Vera, Peter Huber (2005), Quantity adjustments in the regional labour markets of EU candidate countries, Papers in Regional Science, 542-558

Gros, Daniel (2000) EMU, the Euro and Enlargement, manuscript, CEPS, Brussels.

Huber, Peter (2003) What can we learn about labour market adjustment in the candidate countries from literature?, in Karl Aiginger and Gernot Hutschenreiter (Eds.) Economic Policy Issues for the Next Decade, , Kluwer, Boston, pp. 155-186

Huber, Peter (2007) Regional Labour Market Developments in Transition: A Survey of the Empirical Literature, European Journal of Comparative Economics, vol. 4, no. 2, pp. 263-98

Knogler, Michael (2001) Die Arbeitsmärkte der Beitrittskandidaten vor dem Hintergrund der EU-Osterweiterung, Osteuropa Institut München, Working Papers Nr 228.

Longhi, Simonetta; Nijkamp, Peter; Traistaru, Iulia (2005) Is Sectoral Diversification a Solution to Unemployment? Evidence from EU Regions, Kyklos, pp. 591-610

Mosley, Hugh, Antje Mayer (1999) Benchmarking National Labour Market Performance: A Radar Chart Approach, WZB Discussion Paper FS I 99-202

Overmann, Henry G., Diego Puga (2002) Unemployment Clusters across Europe's Regions and Countries, Economic Policy, pp 117 – 147.

Perugini, Cristiano, Marcello Signorelli, (2007) Labour Market Performance Differentials and Dynamics in EU-15 Countries and Regions, European Journal of Comparative Economics, pp. 209-62

Perugini, Cristiano, Marcello Signorelli (2004) Employment Performance and Convergence in the European Countries and Regions, European Journal of Comparative Economics, pp. 243-78.

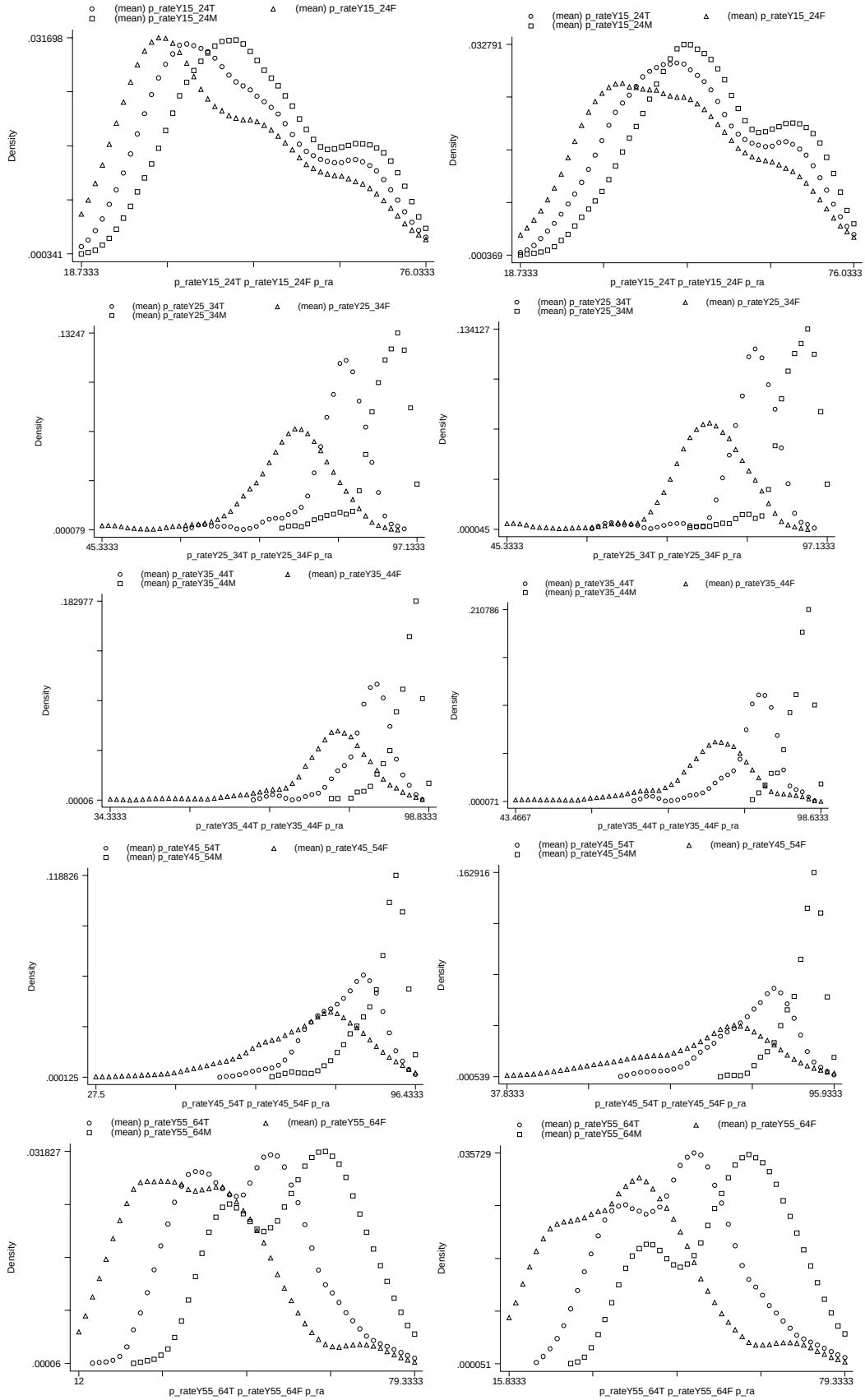
Pench, Lucio R.; Paolo Sestito, Elisabetta Frontini (1999) Some Unpleasant Arithmetics of Regional Unemployment in the EU. Are there any lessons for EMU?, European Commission, Forward Studies Unit, Working Paper 1999.

Scarpetta, Stefano, Peter Huber (1995) Regional Economic Structures and Unemployment in Central and Eastern Europe: An Attempt to Identify Common Patterns in Stefano Scarpetta and Andreas Wörgötter (Eds.) The Regional Dimension of Unemployment in transition Economies, OECD, Paris.

Taylor Jim, Steve Bradley (1997) Unemployment in Europe: A Comparative Analysis of Regional Disparities in Germany, Italy and the U.K., Kyklos, pp. 221 -245

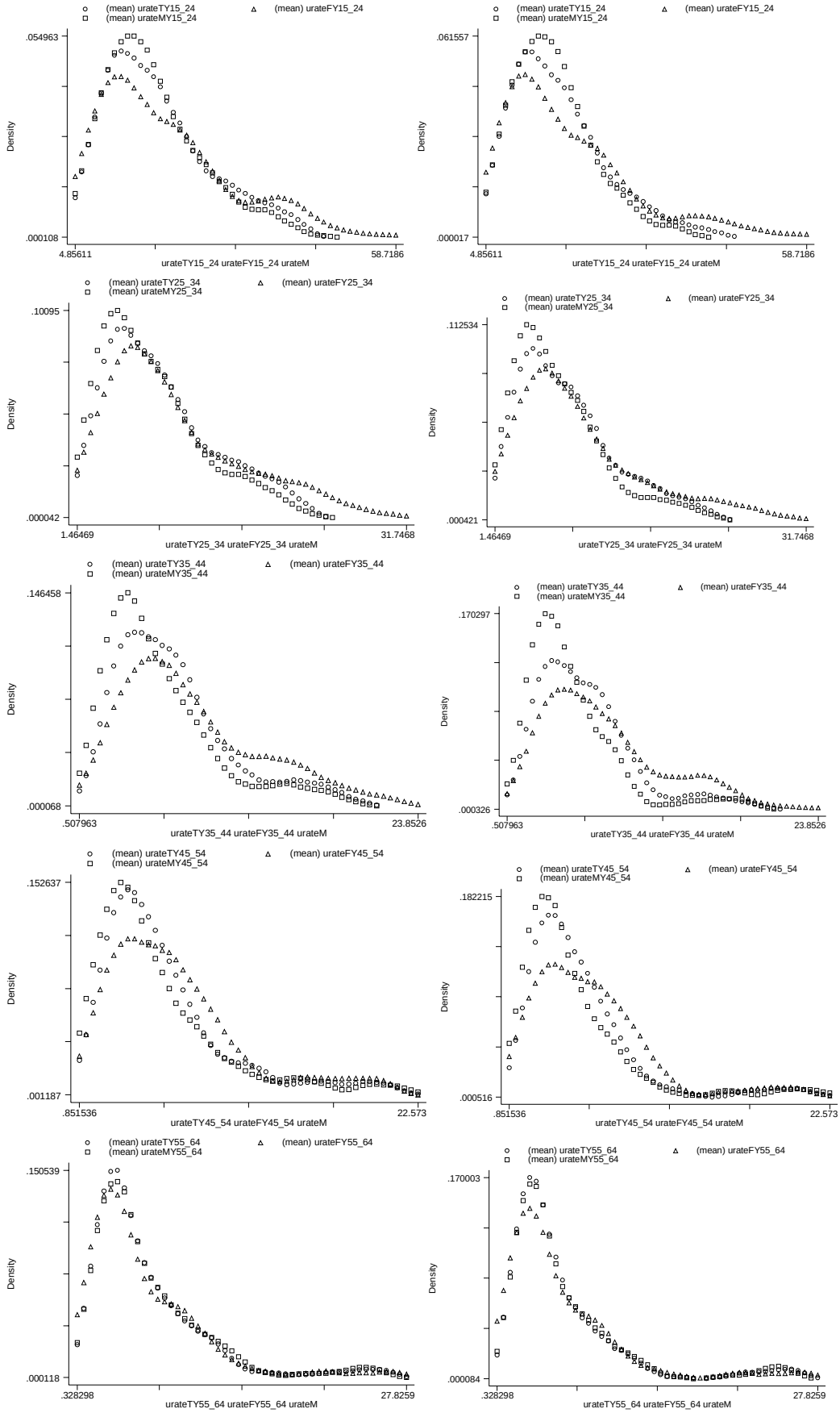
Wiese; Christian; John Bachtler, Ruth Downes, Irenen McMaster and Kathleen Toepel (2001) The Impact of EU Enlargement on Cohesion, DIW – German Institute for Economic Research and EPRC European Policies Research Centre, Berlin and Glasgow, March 2001.

Figure A1 Kernel density esrimates of the regional distribution of participation rates by age group



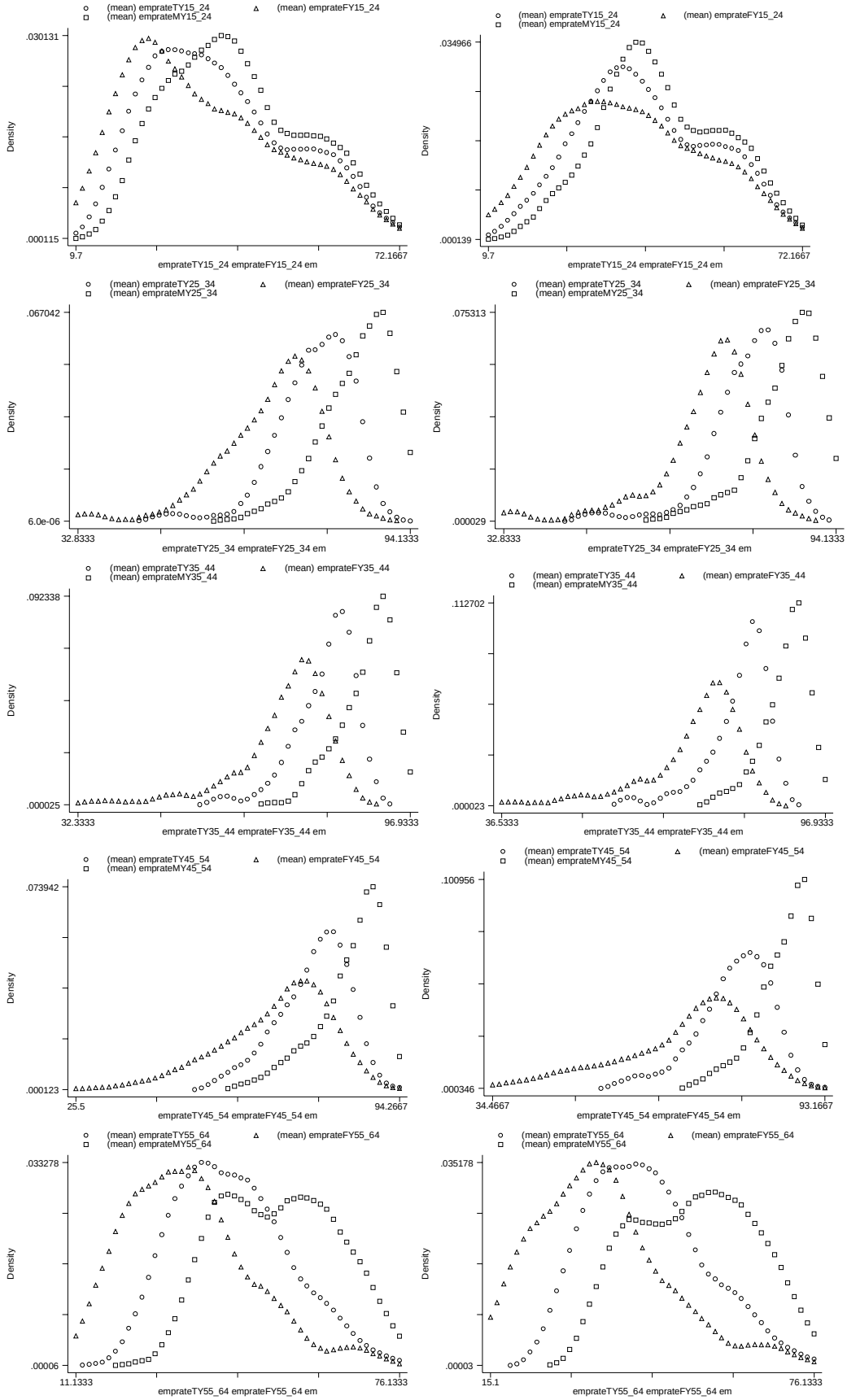
Source: Eurostat, own calculations, Figure is based on average values for the years 2004 to 2006;

Figure A2: Kernel density esrimates of the regional distriiution of unemployment rates by age group



Source: Eurostat, own calculations, Figure is based on average values for the years 2004 to 2006;

Figure A3: Kernel density esrimates of the regional distribution of employment rates by age group



Source: Eurostat, own calculations, Figure is based on average values for the years 2004 to 2006;

Table A1: Regression results for regional unemployment rates of youths and older

	ALL	NMS	EU15	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Dependent variable: unemployment rate of the 15-24 year olds								
Ln(low	0.140*	0.342**	0.056	-0.514	0.084	0.364	-0.064	-0.671**
education share)	(0.084)	(0.150)	0.119	(0.829)	(0.080)	(0.219)	(0.297)	(0.275)
Ln(high	-0.049	-0.005	-0.014	-2.389	0.088	-0.027	-0.776***	-0.540*
education share)	(0.137)	(0.278)	0.160	(2.172)	(0.221)	(0.299)	(0.249)	(0.311)
Ln(share of	-1.478	-5.409***	-2.187**	-0.747	-2.579	-0.542	1.568	0.836
population above 25)	(0.934)	(1.799)	1.077	(10.024)	(1.661)	(1.750)	(2.450)	(2.299)
Ln(agricultral	-0.113***	-0.160*	-0.078	-0.485	-0.194***	-0.070	-0.016	-0.113***
employment share)	(0.042)	(0.084)	0.047	(0.278)	(0.039)	(0.077)	(0.072)	(0.035)
Ln(other service	0.461**	0.582	0.534***	1.745	1.073***	0.550**	0.246	-0.084
employment share)	(0.178)	(0.421)	0.195	(1.344)	(0.299)	(0.241)	(0.307)	(0.435)
Ln(construction	0.047	0.317*	0.067	0.038	0.086	-0.282	0.122	0.181
employment share)	(0.096)	(0.175)	0.120	(0.650)	(0.119)	(0.202)	(0.198)	(0.164)
Ln(trade & restaurants	0.039	-0.113	0.139	-0.096	0.014	-0.182	0.289	-0.488**
emlpoyment share)	(0.160)	(0.338)	0.173	(1.101)	(0.288)	(0.229)	(0.221)	(0.234)
Ln(financial &real est.	0.188*	-0.012	0.279**	0.620	-0.273	0.429**	-0.151	0.151
employment share)	(0.101)	(0.148)	0.119	(0.587)	(0.175)	(0.204)	(0.222)	(0.135)
Ln(employment	0.243	1.346	0.091	-1.164	0.730	0.068	0.438	0.737
growth)	(0.354)	(0.811)	0.423	(5.050)	(0.471)	(0.526)	(1.267)	(1.116)
Ln(structural change)	-0.022	**0.100***	**-0.031**	-0.192	-0.017	0.017	-0.110**	0.001
	(0.031)	(0.055)	0.036	(0.147)	(0.037)	(0.090)	(0.043)	(0.068)
Ln(productivity)	-0.298	-0.853	-0.357	-0.334	0.411	-0.904	-0.705**	-1.690***
	(0.249)	(0.696)	0.269	(0.970)	(0.414)	(0.666)	(0.325)	(0.527)
Ln(wages)	-0.268	0.514	-0.071	-0.416	-0.606	-0.079	1.004*	1.651***
	(0.301)	(0.830)	0.361	(1.263)	(0.398)	(0.832)	(0.521)	(0.440)
Ln(long term	0.701***	0.849***	0.652***	0.161	0.603***	0.560***	0.443**	0.330**
unemployment share	(0.116)	(0.255)	0.119	(0.490)	(0.150)	(0.178)	(0.181)	(0.153)
Ln(aggregate	-1.175***	-2.551***	-1.242**	0.633	0.885	-1.528*	-1.154*	-0.766
participation rate)	(0.429)	(0.794)	0.502	(2.871)	(0.783)	(0.820)	(0.638)	(0.771)
No. observations	257	55	202	25	60	65	48	59
R2	0.86	0.94	0.85	0.89	0.95	0.88	0.93	0.91
Dependent variable: unemployment rate of the 55-64 year olds								
Ln(low	-0.167	0.079	-0.315*	-0.436	-0.401**	0.174	0.515	-1.177
education share)	(0.149)	(0.315)	(0.188)	(0.833)	(0.165)	(0.530)	(0.458)	(0.884)
Ln(high	-0.303	-0.522	-0.368	-2.068	0.073	-0.389	-1.504***	-1.461
education share)	(0.246)	(0.518)	(0.302)	(2.178)	(0.365)	(0.580)	(0.523)	(0.867)
Ln(share of	0.823	3.900	-1.524	-1.462	5.080	1.838	-0.738	-2.729
population above 25)	(2.159)	(5.845)	(2.588)	(10.108)	(3.968)	(3.179)	(3.561)	(4.961)
Ln(agricultral	-0.142***	-0.199	-0.100*	-0.427	-0.327***	-0.178	-0.148	0.072
employment share)	(0.054)	(0.184)	(0.058)	(0.273)	(0.085)	(0.128)	(0.101)	(0.097)
Ln(other service	-0.072	0.974	-0.114	0.744	1.112	-0.348	0.662	-0.290
employment share)	(0.345)	(0.774)	(0.380)	(1.311)	(0.556)	(0.482)	(0.466)	(1.118)
Ln(construction	0.480***	0.583	0.543**	0.126	0.413	-0.113	0.502	0.773*
employment share)	(0.178)	(0.475)	(0.228)	(0.492)	(0.260)	(0.308)	(0.536)	(0.450)
Ln(trade & restaurants	0.298	0.002	0.270	-0.129	0.140	0.238	0.127	-0.792
emlpoyment share)	(0.331)	(0.973)	(0.387)	(1.124)	(0.576)	(0.416)	(0.549)	(0.793)
Ln(financial &real est.	0.253	-0.214	0.460	0.604	-0.558	-0.112	0.403	0.920*
employment share)	(0.215)	(0.365)	(0.265)	(0.683)	(0.337)	(0.347)	(0.495)	(0.501)
Ln(employment	-0.006	0.314	-0.010	-2.181	-0.496	0.397	-2.188	3.969
growth)	(0.709)	(1.742)	(0.875)	(4.740)	(0.955)	(1.344)	(1.902)	(2.213)
Ln(structural change)	-0.102	0.090	-0.121**	-0.181	0.070	-0.099	-0.139	-0.140
	(0.052)	(0.151)	(0.058)	(0.155)	(0.077)	(0.145)	(0.084)	(0.148)
Ln(productivity)	0.171	0.070	0.131	-0.858	0.645	-0.226	-0.158	-1.579
	(0.470)	(1.529)	(0.530)	(1.071)	(0.658)	(1.117)	(0.779)	(1.515)
Ln(wages)	-0.449	0.002	-0.251	0.580	-0.657	0.678	0.890	1.718
	(0.507)	(1.794)	(0.602)	(1.425)	(0.737)	(1.162)	(1.332)	(1.426)
Ln(long term	0.853***	0.891*	0.817**	1.017*	0.578	0.242	0.349	0.476
unemployment share	(0.186)	(0.507)	(0.208)	(0.491)	(0.394)	(0.374)	(0.245)	(0.285)
Ln(aggregate	-0.967	-0.293	-1.326	0.805	2.467**	-3.427*	-1.609	-1.603
participation rate)	(0.753)	(1.734)	(0.888)	(3.005)	(1.094)	(1.725)	(1.073)	(1.695)
No. observations	257	55	202	25	60	65	48	59
R2	0.82	0.86	0.75	0.98	0.9	0.86	0.8	0.67

Source: Eurostat, own calculations, dependent variable: ln(unemployment rate), values in brackets are heteroskedasticity robust standard errors, *** (**) (*) signify significance at the 1 (5) (10)% level respectively, bold figures report a significant (at the 5% level) difference of coefficient estimates between the NMS12 and the EU15, regression includes country dummies, which are not reported

Table A2: Regression results for regional male and female unemployment rates

	ALL	NMS	EU15	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
	Dependent variable: Female unemployment rate							
Ln(low	0.089	0.289	-0.025	-1.002	-0.077	0.472	0.351**	-0.662*
education share)	(0.116)	(0.212)	(0.158)	(0.589)	(0.121)	(0.305)	(0.170)	(0.385)
Ln(high	-0.037	-0.392	0.050	-3.007*	0.357	-0.047	-0.572**	-0.624
education share)	(0.176)	(0.376)	(0.202)	(1.520)	(0.285)	(0.361)	(0.226)	(0.456)
Ln(share of	-2.943**	-4.077	-4.626***	-5.476	-1.331	-1.004	-1.452	0.498
population above 25)	(1.193)	(2.693)	(1.332)	(5.694)	(2.388)	(2.346)	(1.514)	(3.172)
Ln(agricultral	-0.097	-0.086	-0.056	-0.436	-0.236***	0.005	-0.042	-0.039
employment share)	(0.052)	(0.104)	(0.058)	(0.239)	(0.064)	(0.065)	(0.052)	(0.068)
Ln(other service	0.264	0.431	0.317	0.907	0.927**	0.351	0.185	-0.675
employment share)	(0.200)	(0.581)	(0.222)	(1.024)	(0.362)	(0.297)	(0.227)	(0.631)
Ln(construction	0.317***	0.374	0.367**	-0.064	0.334**	-0.211	0.215	0.487*
employment share)	(0.120)	(0.245)	(0.152)	(0.397)	(0.155)	(0.258)	(0.205)	(0.240)
Ln(trade & restaurants	0.125	0.324	0.192	0.122	0.398	0.114	0.242	-0.530
emlpoyment share)	(0.185)	(0.422)	(0.200)	(0.825)	(0.374)	(0.266)	(0.219)	(0.405)
Ln(financial &real est.	0.127	-0.002	0.259	0.626	-0.601***	0.253	0.115	0.302
employment share)	(0.132)	(0.209)	(0.157)	(0.469)	(0.205)	(0.232)	(0.211)	(0.193)
Ln(employment	0.011	1.046	-0.080	-1.183	-0.174	0.484	-1.208	-0.211
growth)	(0.457)	(0.966)	(0.570)	(3.783)	(0.603)	(0.695)	(0.883)	(1.219)
Ln(structural change)	-0.018	0.090	-0.018	-0.243*	-0.014	0.030	-0.024	-0.046
	(0.033)	(0.063)	(0.040)	(0.121)	(0.049)	(0.095)	(0.037)	(0.101)
Ln(productivity)	-0.150	-0.580	-0.286	-0.424	0.299	-0.698	-0.273	-2.161***
	(0.315)	(1.079)	(0.343)	(0.631)	(0.523)	(0.740)	(0.306)	(0.667)
Ln(wages)	-0.237	0.446	0.073	0.017	-0.347	0.228	0.304	2.425***
	(0.355)	(1.199)	(0.433)	(0.901)	(0.571)	(0.719)	(0.482)	(0.546)
Ln(long term	0.764***	0.716**	0.704***	0.548	0.498*	0.631***	0.471***	0.240
unemployment share	(0.142)	(0.324)	(0.144)	(0.348)	(0.269)	(0.206)	(0.108)	(0.196)
Ln(aggregate	-1.375***	-2.411**	-1.548**	0.470	1.766**	-1.716	-2.036***	-1.286
participation rate)	(0.511)	(1.007)	(0.600)	(2.480)	(0.741)	(1.073)	(0.469)	(0.862)
No. observations	257	55	202	25	60	65	48	59
R2	0.85	0.93	0.84	0.88	0.92	0.79	0.940	0.860
	Dependent variable: male unemployment rate							
Ln(low	0.103	0.281	-0.092	-0.097	0.0696	0.692**	0.4873	-1.14***
education share)	(0.12)	(0.206)	(0.145)	(0.7305)	(0.120)	(0.310)	(0.409)	(0.331)
Ln(high	-0.09	-0.186	-0.127	-1.473	0.626*	-0.077	-0.973***	-0.758*
education share)	(0.188)	(0.325)	(0.22)	(1.8398)	(0.330)	(0.358)	(0.392)	(0.391)
Ln(share of	-3.043***	-5.151	-4.583***	-3.026	-3.038	0.650	2.236	-2.973
population above 25)	(1.406)	(2.701)	(1.578)	(9.9209)	(1.920)	(2.198)	(3.233)	(2.351)
Ln(agricultral	-0.159***	-0.173*	-0.100*	-0.42	-0.290***	-0.072	-0.047	-0.147***
employment share)	(0.048)	(0.098)	(0.051)	(0.2818)	(0.060)	(0.080)	(0.105)	(0.046)
Ln(other service	0.515**	1.459**	0.534**	1.1501	1.150***	0.4442	0.295	-0.449
employment share)	(0.237)	(0.538)	(0.257)	(1.2499)	(0.385)	(0.278)	(0.399)	(0.465)
Ln(construction	0.245**	0.420*	0.375***	-0.127	0.176	-0.412*	0.286	0.4265**
employment share)	(0.119)	(0.238)	(0.151)	(0.4323)	(0.140)	(0.2374)	(0.351)	(0.180)
Ln(trade & restaurants	0.127	-0.189	0.297	-0.151	0.2771	-0.057	0.189	-0.637*
emlpoyment share)	(0.227)	(0.462)	(0.266)	(1.2555)	(0.373)	(0.262)	(0.437)	(0.320)
Ln(financial &real est.	0.124	-0.116	0.312***	0.7289	-0.519**	0.1982	0.365	0.044
employment share)	(0.129)	(0.193)	(0.155)	(0.6863)	(0.222)	(0.228)	(0.382)	(0.185)
Ln(employment	-0.544	1.172	-0.793	-2.695	0.444	-0.052	-1.523	1.088
growth)	(0.492)	(1.111)	(0.557)	(4.472)	(0.7119)	(0.703)	(1.507)	(0.842)
Ln(structural change)	-0.057	0.103	-0.065	-0.076	0.017	0.0307	-0.136*	-0.082
	(0.038)	(0.072)	(0.042)	(0.155)	(0.040)	(0.095)	(0.071)	(0.077)
Ln(productivity)	-0.009	0.271	-0.206	0.103	0.471	-0.867	-0.374	-0.963
	(0.333)	(0.825)	(0.371)	(0.990)	(0.456)	(0.681)	(0.575)	(0.656)
Ln(wages)	-0.433	-0.675	0.073	-0.443	-0.698	0.507	0.515	1.090*
	(0.382)	(1.003)	(0.446)	(1.239)	(0.430)	(0.819)	(0.979)	(0.602)
Ln(long term	0.905***	1.055***	0.858***	0.3161	0.658***	0.525**	0.510**	0.552***
unemployment share	(0.136)	(0.311)	(0.135)	(0.524)	(0.233)	(0.221)	(0.208)	(0.138)
Ln(aggregate	-1.012*	-1.174	-1.324***	-1.632	0.853	-1.158	-0.938	-1.046
participation rate)	(0.549)	(1.025)	(0.625)	(2.730)	(0.735)	(1.026)	(0.994)	(0.747)
No. observations	257	55	202	25	60	65	48	59
R2	0.81	0.93	0.78	0.92	0.87	0.91	0.73	0.88

Source: Eurostat, own calculations, dependent variable: ln(unemployment rate), values in brackets are heteroskedasticity robust standard errors, *** (**) (*) signify significance at the 1 (5) (10)% level respectively, bold figures report a significant (at the 5% level) difference of coefficient estimates between the NMS12 and the EU15, regression includes country dummies, which are not reported

Table A3: Regression results for regional employment rates of youths and older

	ALL	NMS	EU15	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
	Dependent Variable: Employment rate of the 15-24 year olds							
Ln(low	-0.192***	-0.229***	-0.181***	0.222	-0.153***	-0.197	-0.158	-0.093
education share)	(0.037)	(0.070)	(0.046)	(0.152)	(0.043)	(0.133)	(0.196)	(0.126)
Ln(high	-0.262***	-0.313***	-0.268***	0.555	-0.177	-0.323*	-0.166	-0.143
education share)	(0.063)	(0.131)	(0.078)	(0.445)	(0.106)	(0.182)	(0.148)	(0.126)
Ln(share of	-1.180***	-0.077	-0.852	2.712	-2.685***	-0.527	-4.844***	-1.102
population above 25)	(0.557)	(1.161)	(0.675)	(1.666)	(0.857)	(1.287)	(1.552)	(0.836)
Ln(agricultral	0.028*	0.117***	0.005	0.085	0.069***	0.017	-0.038	0.053***
employment share)	(0.016)	(0.033)	(0.017)	(0.063)	(0.022)	(0.033)	(0.030)	(0.016)
Ln(other service	-0.243***	-0.150	-0.285***	-0.409	-0.336**	-0.454***	-0.218	-0.003
employment share)	(0.064)	(0.269)	(0.068)	(0.275)	(0.148)	(0.151)	(0.174)	(0.141)
Ln(construction	-0.009	-0.090	-0.035	-0.006	-0.067	0.179	-0.351**	0.044
employment share)	(0.050)	(0.121)	(0.060)	(0.117)	(0.089)	(0.123)	(0.136)	(0.066)
Ln(trade & restaurants	0.075	0.253	0.016	-0.247	0.054	0.141	0.098	0.238
emlpoyment share)	(0.077)	(0.163)	(0.086)	(0.224)	(0.193)	(0.172)	(0.208)	(0.090)
Ln(financial &real est.	-0.011	0.101	-0.079	-0.315*	0.287**	-0.091	-0.057	0.025
employment share)	(0.043)	(0.089)	(0.049)	(0.146)	(0.118)	(0.107)	(0.172)	(0.045)
Ln(employment	-0.055	**-0.808**	0.149	0.541	-0.402	0.057	0.534	-0.281
growth)	(0.171)	(0.489)	(0.193)	(1.020)	(0.271)	(0.298)	(0.511)	(0.309)
Ln(structural change)	0.009	-0.002	0.000	0.019	0.016	0.005	0.067	-0.046**
	(0.016)	(0.027)	(0.019)	(0.038)	(0.024)	(0.039)	(0.037)	(0.022)
Ln(productivity)	0.125	0.345	0.167	0.071	0.070	0.142	0.280	-0.066
	(0.107)	(0.542)	(0.113)	(0.185)	(0.292)	(0.380)	(0.239)	(0.169)
Ln(wages)	0.015	-0.162	-0.098	-0.004	-0.144	0.206	-0.181	0.003
	(0.132)	(0.578)	(0.151)	(0.315)	(0.297)	(0.424)	(0.442)	(0.159)
Ln(long term	-0.210***	-0.204*	-0.210***	-0.164	-0.190*	-0.172*	-0.173*	-0.133***
unemployment share	(0.039)	(0.116)	(0.042)	(0.081)	(0.096)	(0.086)	(0.096)	(0.044)
Ln(aggregate	0.946***	1.457***	0.921***	0.688	0.210	0.278	0.300	0.872***
participation rate)	(0.155)	(0.432)	(0.184)	(0.718)	(0.284)	(0.494)	(0.637)	(0.228)
No. observations	257	55	202	25	60	65	48	59
R2	0.95	0.93	0.94	0.98	0.97	0.91	0.96	0.97
	Dependent Variable: Employment rate of the 55-64 year old							
Ln(low	0.273***	0.178	0.290***	0.054	0.198***	0.364*	-0.086	0.357**
education share)	(0.041)	(0.122)	(0.050)	(0.188)	(0.064)	(0.182)	(0.133)	(0.133)
Ln(high	0.379***	0.250	0.365***	-0.388	0.470***	0.618***	0.042	0.173
education share)	(0.077)	(0.175)	(0.081)	(0.556)	(0.102)	(0.214)	(0.187)	(0.131)
Ln(share of	-1.045*	**-3.267**	0.188	-0.679	-0.368	-2.698**	1.429	0.363
population above 25)	(0.571)	(1.720)	(0.602)	(1.861)	(1.242)	(1.087)	(1.050)	(0.978)
Ln(agricultral	0.049***	0.066	0.035**	-0.043	0.127***	0.049	0.070**	0.009
employment share)	(0.016)	(0.057)	(0.015)	(0.071)	(0.027)	(0.042)	(0.034)	(0.019)
Ln(other service	-0.005	-0.074	-0.008	0.516	-0.463***	0.347**	0.050	0.077
employment share)	(0.082)	(0.350)	(0.081)	(0.370)	(0.161)	(0.144)	(0.187)	(0.146)
Ln(construction	-0.100**	-0.265	-0.073	-0.055	-0.033	-0.161	-0.012	-0.111
employment share)	(0.050)	(0.155)	(0.050)	(0.160)	(0.082)	(0.092)	(0.153)	(0.070)
Ln(trade & restaurants	0.000	-0.210	0.085	0.235	-0.253	0.060	-0.173	-0.065
emlpoyment share)	(0.080)	(0.249)	(0.074)	(0.222)	(0.212)	(0.146)	(0.143)	(0.121)
Ln(financial &real est.	0.048	0.040	0.009	0.014	-0.058	-0.009	-0.022	-0.003
employment share)	(0.050)	(0.120)	(0.052)	(0.181)	(0.108)	(0.101)	(0.150)	(0.059)
Ln(employment	-0.295	0.308	-0.366	-2.524	-0.168	0.098	-0.525	-0.647
growth)	(0.195)	(0.453)	(0.209)	(1.448)	(0.283)	(0.378)	(0.566)	(0.408)
Ln(structural change)	0.017	-0.041	0.022	0.023	-0.033	-0.015	-0.029	0.048
	(0.018)	(0.038)	(0.018)	(0.048)	(0.031)	(0.042)	(0.034)	(0.034)
Ln(productivity)	0.182	0.258	0.145	0.135	0.011	0.425	0.167	0.429
	(0.123)	(0.682)	(0.102)	(0.204)	(0.284)	(0.423)	(0.204)	(0.273)
Ln(wages)	-0.176	0.051	-0.187	0.069	0.399	-0.498	-0.248	-0.423*
	(0.134)	(0.773)	(0.114)	(0.388)	(0.298)	(0.413)	(0.351)	(0.247)
Ln(long term	-0.062	-0.157	-0.060	-0.019	-0.138	0.030	-0.155*	-0.135**
unemployment share	(0.043)	(0.215)	(0.040)	(0.084)	(0.146)	(0.094)	(0.078)	(0.057)
Ln(aggregate	1.027***	1.754***	0.924***	2.431	0.611**	1.082**	1.050**	1.301***
participation rate)	(0.170)	(0.614)	(0.177)	(1.066)	(0.272)	(0.500)	(0.454)	(0.254)
No. observations	257	55	202	25	60	65	48	59
R2	0.89	0.93	0.89	0.98	0.93	0.92	0.84	0.92

Source: Eurostat, own calculations, dependent variable: ln(employment rate), values in brackets are heterosjedasticity robust standard errors, *** (**) (*) signify significance at the 1 (5) (10)% level respectively, bold figures report a significant (at the 5% level) difference of coefficient estimates between the NMS12 and the EU15, regression includes country dummies, which are not reported

Table A4: Regression results for regional male and female employment rates

	ALL	NMS	EU15	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
				Dependen Variable: Female employment rate				
Ln(low	-0.108***	-0.076*	-0.117***	0.020	-0.024	-0.091**	-0.206***	-0.050
education share)	(0.021)	(0.039)	(0.029)	(0.034)	(0.023)	(0.035)	(0.071)	(0.059)
Ln(high	0.088***	**0.020**	0.134***	0.072	-0.013	-0.011	-0.028	0.045
education share)	(0.032)	(0.057)	(0.037)	(0.108)	(0.057)	(0.049)	(0.076)	(0.055)
Ln(share of	0.917***	0.269	1.272	0.919	-0.045	0.337	1.446	-0.658
population above 25)	(0.259)	(0.529)	(0.278)	(0.500)	(0.470)	(0.359)	(0.514)	(0.376)
Ln(agricultral	0.004	0.016	-0.003	0.033	0.039	0.003	0.016	-0.002
employment share)	(0.008)	(0.020)	(0.009)	(0.013)	(0.012)	(0.010)	(0.015)	(0.008)
Ln(other service	-0.017	-0.069	-0.037	0.002	-0.132*	-0.009	-0.022	0.093
employment share)	(0.031)	(0.120)	(0.032)	(0.056)	(0.067)	(0.041)	(0.073)	(0.070)
Ln(construction	-0.102***	-0.152***	-0.094***	-0.008	-0.093***	0.006	-0.069	-0.096***
employment share)	(0.021)	(0.047)	(0.026)	(0.028)	(0.031)	(0.033)	(0.054)	(0.034)
Ln(trade & restaurants	-0.045	-0.031	-0.046	-0.062	-0.087	-0.021	-0.052	0.036
emlpoyment share)	(0.032)	(0.073)	(0.033)	(0.049)	(0.078)	(0.034)	(0.052)	(0.053)
Ln(financial &real est.	-0.017	0.033	-0.039	-0.021	0.111	-0.021	-0.033	-0.027
employment share)	(0.022)	(0.036)	(0.026)	(0.028)	(0.041)	(0.031)	(0.057)	(0.022)
Ln(employment	0.050	0.006	0.076	-0.037	0.140	0.013	0.377	0.037
growth)	(0.099)	(0.170)	(0.116)	(0.181)	(0.130)	(0.117)	(0.243)	(0.141)
Ln(structural change)	0.004	-0.004	0.000	0.009	0.005	-0.001	-0.012	0.006
	(0.006)	(0.013)	(0.006)	(0.007)	(0.013)	(0.010)	(0.010)	(0.011)
Ln(productivity)	-0.002	-0.133	0.033	0.065	0.028	0.014	-0.048	0.158*
	(0.053)	(0.144)	(0.059)	(0.033)	(0.110)	(0.090)	(0.087)	(0.085)
Ln(wages)	0.004	0.106	-0.034	0.005	-0.073	0.006	-0.061	-0.203**
	(0.058)	(0.170)	(0.069)	(0.064)	(0.115)	(0.081)	(0.127)	(0.081)
Ln(long term	-0.072***	-0.079	-0.059***	-0.053	-0.002	-0.027	-0.055	0.001
unemployment share	(0.019)	(0.061)	(0.019)	(0.020)	(0.051)	(0.027)	(0.038)	(0.022)
Ln(aggregate	1.522***	1.378***	1.524***	1.260***	0.831***	1.404**	1.894***	1.349***
participation rate)	(0.090)	(0.208)	(0.100)	(0.166)	(0.137)	(0.149)	(0.201)	(0.104)
No. observations	257	55	202	25	60	65	48	59
R2	0.96	0.96	0.97	0.98	0.94	0.97	0.98	0.98
				Dependent Variable: Male employment rate				
Ln(low	-0.068***	**-0.002**	-0.106***	0.037	0.011	-0.006	0.035	-0.149***
education share)	(0.017)	(0.026)	(0.022)	(0.056)	(0.021)	(0.030)	(0.047)	(0.036)
Ln(high	0.053**	0.001	0.072***	0.192	-0.104	0.046	0.142***	0.107***
education share)	(0.023)	(0.043)	(0.028)	(0.160)	(0.064)	(0.029)	(0.047)	(0.031)
Ln(share of	-0.060	**0.881****	0.016	-0.286	0.792	-0.302	-0.794	0.535**
population above 25)	(0.184)	(0.312)	(0.204)	(0.793)	(0.452)	(0.179)	(0.309)	(0.203)
Ln(agricultral	0.015**	**0.036****	0.005	0.015	0.048***	0.001	-0.007	0.008**
employment share)	(0.006)	(0.011)	(0.007)	(0.022)	(0.011)	(0.008)	(0.011)	(0.004)
Ln(other service	-0.085***	**-0.279****	-0.070	-0.094	-0.251***	-0.069**	-0.053	0.009
employment share)	(0.032)	(0.060)	(0.036)	(0.113)	(0.076)	(0.028)	(0.045)	(0.029)
Ln(construction	0.000	-0.014	-0.027	0.010	-0.009	0.031	-0.002	0.028
employment share)	(0.014)	(0.026)	(0.018)	(0.041)	(0.026)	(0.019)	(0.036)	(0.019)
Ln(trade & restaurants	-0.007	0.042	-0.035	0.042	-0.042	0.002	0.010	0.038
emlpoyment share)	(0.024)	(0.057)	(0.026)	(0.104)	(0.081)	(0.025)	(0.045)	(0.023)
Ln(financial &real est.	0.012	**0.046***	-0.011	-0.057	0.064	-0.009	-0.005	0.005
employment share)	(0.015)	(0.023)	(0.017)	(0.067)	(0.046)	(0.019)	(0.034)	(0.012)
Ln(employment	-0.004	-0.176	-0.018	0.095	-0.201	0.003	0.027	-0.138*
growth)	(0.063)	(0.209)	(0.062)	(0.363)	(0.152)	(0.082)	(0.147)	(0.080)
Ln(structural change)	0.008*	-0.009	0.010**	0.007	-0.002	-0.002	0.022***	0.004
	(0.004)	(0.007)	(0.004)	(0.014)	(0.008)	(0.009)	(0.006)	(0.006)
Ln(productivity)	0.021	-0.135	0.056	-0.058	-0.139	0.075	0.079	0.055
	(0.039)	(0.089)	(0.042)	(0.071)	(0.113)	(0.057)	(0.067)	(0.048)
Ln(wages)	0.043	**0.225****	-0.046	0.007	0.228**	-0.063	-0.079	-0.044
	(0.043)	(0.102)	(0.047)	(0.102)	(0.105)	(0.068)	(0.104)	(0.050)
Ln(long term	-0.074***	**-0.127****	-0.069***	-0.006	-0.161***	-0.053**	-0.039	-0.037***
unemployment share	(0.016)	(0.031)	(0.016)	(0.039)	(0.043)	(0.024)	(0.024)	(0.011)
Ln(aggregate	0.728***	0.783***	0.786***	0.852***	0.705***	0.740***	0.690***	0.888***
participation rate)	(0.073)	(0.109)	(0.080)	(0.253)	(0.153)	(0.106)	(0.133)	(0.051)
No. observations	257	55	202	25	60	65	48	59
R2	0.92	0.97	0.91	0.98	0.89	0.97	0.96	0.98

Source: Eurostat, own calculations, dependent variable: ln(employment rate), values in brackets are heterosjedasticity robust standard errors, *** (**) (*) signify significance at the 1 (5) (10)% level respectively, bold figures report a significant (at the 5% level) difference of coefficient estimates between the NMS12 and the EU15, regression includes country dummies, which are not reported

Medieninhaber (Verleger), Hersteller: Österreichisches Institut für Wirtschaftsforschung • Wien 3, Arsenal, Objekt 20 • A-1103 Wien, Postfach 91 • Tel. (43 1) 798 26 01-0 • Fax (43 1) 798 93 86 • http://www.wifo.ac.at/ • Verlags- und Herstellungsort: Wien