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## The ESPON 2013 Programme

### DEMIFER

Demographic and migratory flows  
affecting European regions and cities

Applied Research Project 2013/1/3

Deliverable 12/04  
Demifer Case Studies

### **Challenge of decline in the Southern Ruhr area Arnsberg (DEA5)**

Prepared by  
Frank Heins  
IRPPS-CNR, Rome, Italy  
and  
Hansjörg Bucher  
BBSR, Bonn, Germany



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## **Key findings**

- *The case study area is economically very heterogeneous, but most of its sub-areas are going through economic restructuring.*
- *Low economic performance in the study area leads to an acceleration of population decline and demographic ageing.*
- *Internal migration and international migration flows are playing a minor role.*
- *The internal migration fields of key age groups are limited.*
- *The population with a migratory background represents a considerable share of the population.*
- *Economic effects of the ageing of the population and the working age population are difficult to measure. High unemployment makes the ageing of the working age population a secondary problem.*
- *The results of the policy scenarios indicate a slower population loss than the Status Quo scenario. The shrinking of the population combined with the on-going economic restructuring process creates considerable challenges to the economic and social fabric of the study area.*

## **1. Introduction**

Arnsberg is a Regierungsbezirk of the Land North Rhine-Westphalia and comprises the Eastern part of the Ruhr agglomeration and the Sauerland. The Northwestern part of the Regierungsbezirk is part of the Ruhr area with a high population density and the major cities are Dortmund, Bochum, Hagen, Hamm and Herne. The Eastern and Southern part has a lower population density and only Siegen ( inhabitants) as an urban centre.

The case study area of Arnsberg is very heterogeneous and very divers settlement structure between its counties. The Ruhr area is the largest German agglomeration. The Eastern part of the old industrialized Ruhr agglomeration is included in the case study area. The economic restructuring process old-industrialised economy to service industry took place over the last decades, but the Ruhr agglomeration continues to have structural deficiencies. The income level is compared to other German relatively low and the level of unemployment is relatively high.

Das Sauerland is a hilly area and relatively sparsely settled, however, with an old tradition manufacturing in small manufacturing, which was already abandoned during the industrial revolution. The Sauerland has a weak economic structure and is a traditional area of out-migration. Family owned companies are giving the economic structure of the area certain stability. The Siegerland (the area around the city of Siegen) forms the most Southern part of the study area. Also this area can be considered rural and old-industrialised simultaneously because of a century old mining tradition. The economic restructuring process of the last decades was most successful in this part and, as a consequence, the income levels and the labour market situation are positive.

Using gross domestic product (GDP) as an indicator for economic output and GDP's change in time as an indicator for economic growth, we may characterise the economic situation and its change in the counties of the case study region. Germany's GDP was – in the average of the last decade – about a quarter higher than that of the EU-27. But since the year 2000 the growth of German GDP was

weaker than in Europe. Today (2007) the NUTS 2 region of Arnsberg has a regional GDP per inhabitant (purchasing power standard) of 26,500 €, just 6.3 percentage points above the EU-27 average and 10 percentage points below the German national level and 9 percentage points below the NUTS1 region North Rhine-Westphalia.

The economic and industrial change of the Ruhr area – from the process of industrialisation in the 19<sup>th</sup> and early 20<sup>th</sup> century to the dismissal of the old industrialisation and the attempts of alternative industries (car manufacturing) at their turn being in constant crises – and its effects on the demographic and migratory changes are at the centre of the case study report. In the study area there are manifold attempts to overcome the structural problems and the negative image of the Ruhr agglomeration with investments in universities, arts and culture.

### **1.1. Specification of the research questions and the aims**

The case studies contribute to improve the knowledge on and the understanding of demographic and migratory flows at the regional and local level. They focus on internal and international migration as the component with stronger links to the regional socio-economic situation and dynamics. In addition in the case studies the output of the policy oriented activities of the DEMIFER project are translated into specific regional settings.

The specific research questions and the specific aims of the case studies are:

- How are demographic and migratory flows affecting the entire case study area, its regional subdivisions and its cities?
- How do demographic change and migratory movements bring about population change – growth or decline -, population ageing and ageing of the working age population?
- What are the factors of attraction or the causes of interregional and international migration at the regional level?
- Is information regarding the skill level of interregional, intra EU and international migrants available?
- What are the economic and social consequences of migratory flows in the case study area, or, more in general, what are the links between 'demography' and 'economy' in the case study areas?

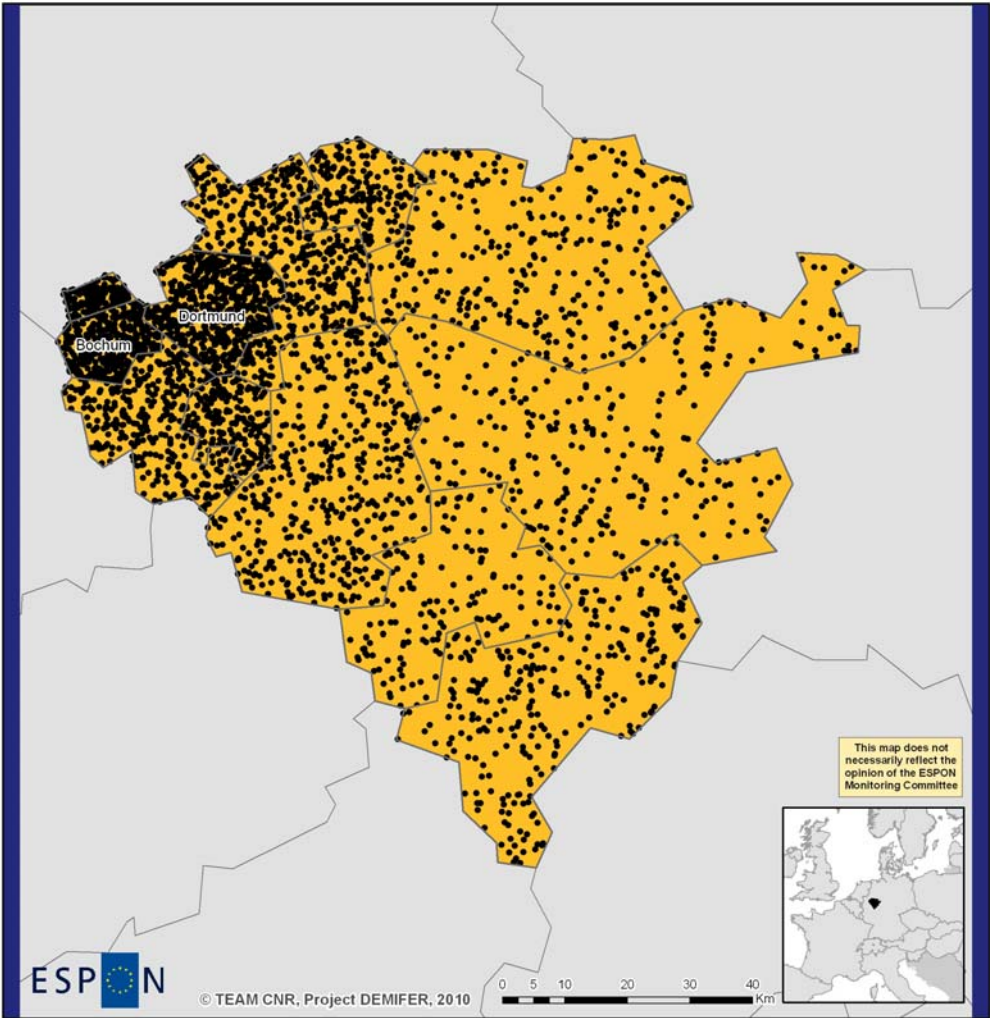
The interrelations between socio-economic and demographic trends are the focus of the case studies. The focus of the case studies is on the description of the socio-demographic structure, demographic and interregional and international migratory processes and their economic and social consequences. The sustainability of the demographic system and the migration process – migration gains and migration losses - at the sub-regional level will be considered in all case studies. The interdependence in the urban areas and between the urban areas and their hinterland is highlighted.

### **1.2. Settlement structure**

The settlement structure of the study area is very heterogeneous with the Northeastern part belonging to the Ruhr Agglomeration and its area of influence, which is densely settled and comprising the major cities of Dortmund and

Bochum. Towards the Eastern part of the study area – the hilly Sauerland – population density decreases. Map 2 confirms the high population density of all the municipalities or cities belonging to the Ruhr agglomeration. These densely settled zones suffered heavy air pollution during industrialisation and they are still today, even after the dismissal of most of the coal and steel industry, associated with a negative image.


**Map 1 Population in the Southern Ruhr area (DEA5 Arnsberg), 1.1.2008**




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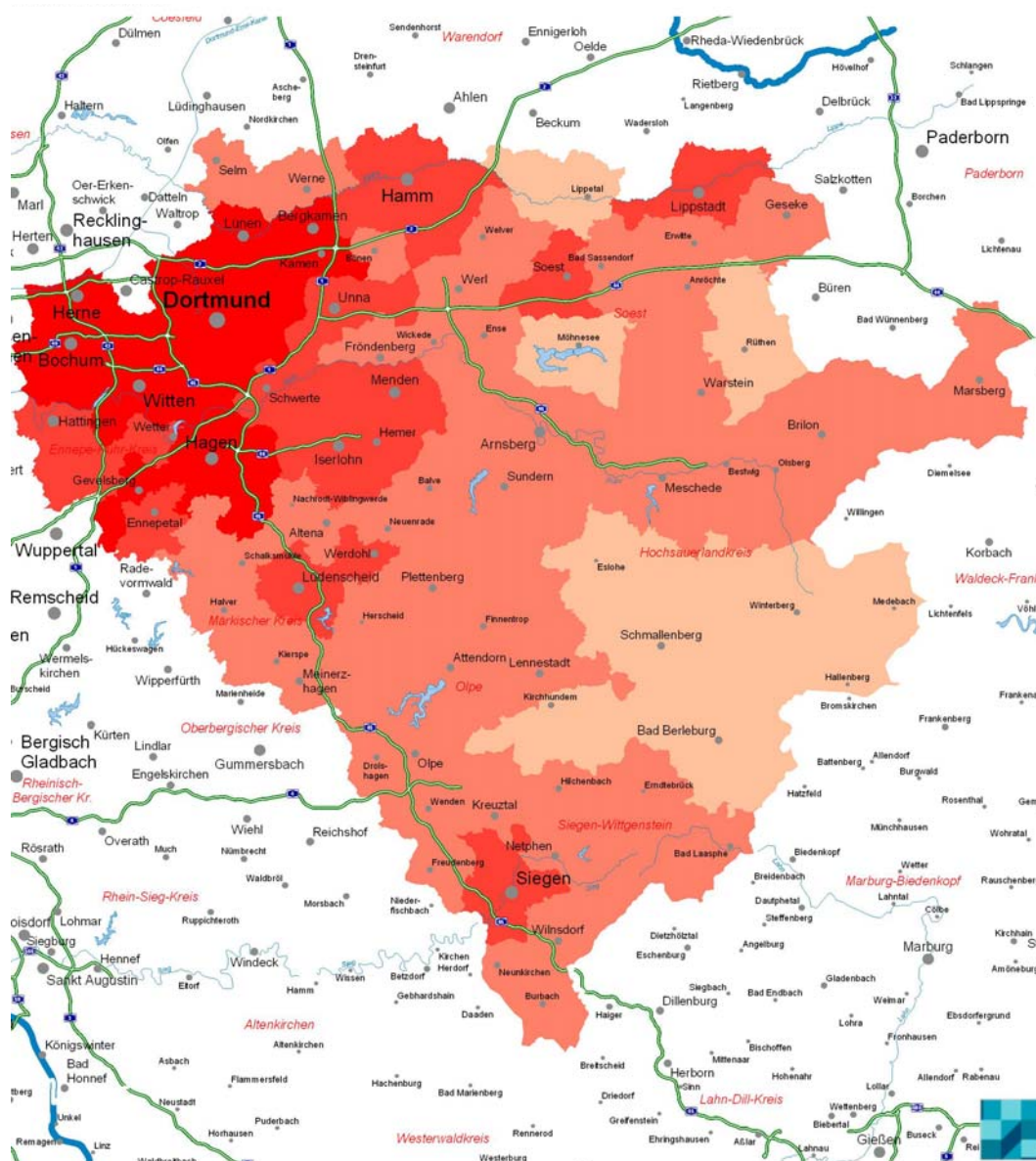
Local level: NUTS3  
 Source: BBSR, INKAR CD-Rom, 2009  
 Origin of data: Federal Statistical Offices, 2009  
 © EuroGeographics Association for administrative boundaries

**Legend**

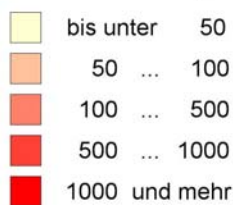
-  1 Dot = 1.000
- Population 31.12.2007



**Map 2 Population density in the Southern Ruhr area (DEA5 Arnsberg), 1.1.2008**



**Einwohner je km<sup>2</sup>**



Gemeindeverbände  
 Zeitbezug 2007  
 Datengrundlage: Fortschreibung des  
 Bevölkerungsstandes des Bundes und der  
 Länder, Eurostat Regio Datenbank

© 2006-2009 BBR Bonn

Source: BBSR, INKAR CD-Rom, 2009.

## 2. Review of existing analysis of demographic and migratory flows in the case study

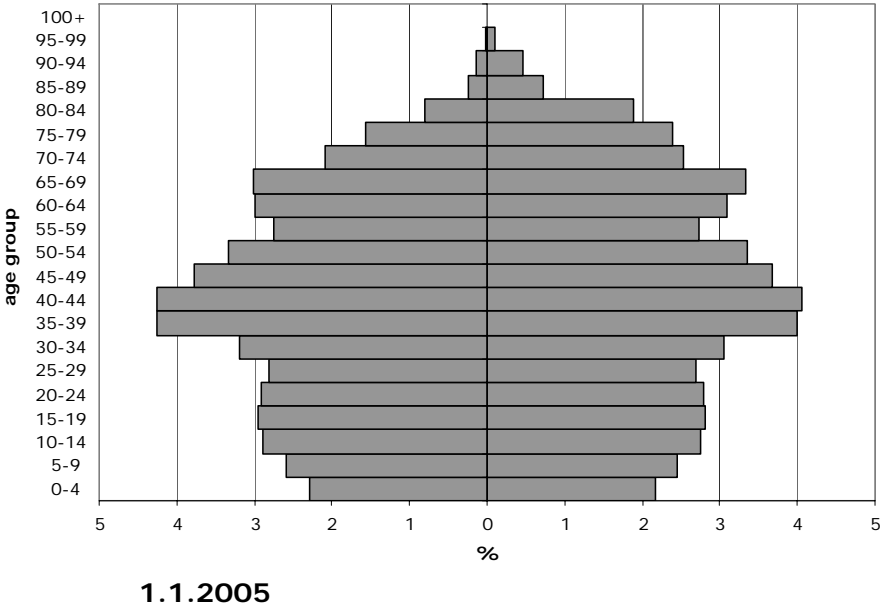
The economic decline of the Ruhr agglomeration and the process of de-industrialisation stimulated a multitude of studies. Several of these studies focussed also on the demographic consequences of this often-unsuccessful economic restructuring process. Population decline and population ageing and the lacking attractiveness are the focus of these studies. Migration is not a real option for the study area because of the lack of attracting factors for interregional and international migration flows.

## 3. Demographic stocks and flows of the case study region and its sub-divisions

### 3.1. Age structure of the population

The case study area has an age structure that is characterised by a high share of the 35 to 44 years old. These age groups are the generations of the baby boom and the following narrowing of the base of the age pyramid is due to the fertility decline of the 1970s and 1980s. In addition the elderly, and especially elderly women, form an important share of the population.

**Figure 1 Population pyramid of the Southern Ruhr area (DEA5 Arnsberg),**



Source: elaborations on ESPON Data Base, 2010.

The highest regional variability in the case study area has the youngest age group. Its share is only 14.9 % in Bochum and reaches 20.1 % in Olpe, a county in the Western part of the study area.

**Table 1 Age structure of the population in the Southern Ruhr area (DEA5 Arnsberg), 31.12.2007**

Counties/ Regional planning regions/ Case study area	Population by age groups 31.12.2007					
	Total	Under 18	18 to 24	20 to 39	25 to 64	65 and older
Bochum (city)	381,542	14.9	8.4	26.1	55.7	21.1
Dortmund (city)	586,909	16.6	8.4	25.9	54.3	20.7
Hagen (city)	193,748	17.9	8.0	23.2	51.8	22.3
Hamm (city)	183,065	18.8	8.1	25.1	53.6	19.5
Herne (city)	168,454	16.5	7.7	24.3	54.5	21.4
Ennepe-Ruhr-Kreis	338,466	16.7	7.5	22.5	53.9	21.9
Hochsauerlandkreis	273,898	19.5	8.1	23.1	51.7	20.7
Märkischer Kreis	441,704	18.9	8.2	23.1	52.6	20.2
Olpe	140,973	20.1	8.3	24.8	53.4	18.2
Siegen	288,441	17.9	8.7	24.5	53.1	20.2
Soest	307,159	19.3	8.2	23.9	53.0	19.5
Unna	419,353	18.1	8.1	23.1	53.7	20.2
Arnsberg	581,057	19.4	8.1	23.5	52.4	20.1
Bochum/Hagen	1,523,914	17.0	8.0	23.9	53.8	21.2
Dortmund	1,189,327	17.4	8.2	24.8	54.0	20.3
Siegen	429,414	18.6	8.6	24.6	53.2	19.6
Total	3,723,712	17.7	8.2	24.2	53.6	20.6

Source: BBSR, INKAR CD-Rom, 2009, and BBSR- Bevölkerungsprognose 2005-2025 data base, 2010.

The DEMIFER project puts special emphasis on trends in the labour force and the working age population. The share of the working age population decreased between 1990 and 2007 in the Southern Ruhr area from 63.7 to 59.3 % and aged over the same period. Bochum has the highest share of the working age population.

**Table 2 Changes in the age structure of the working-age population in the Southern Ruhr area (DEA5 Arnsberg), 1990, 2000 and 2007**

Counties/ Regional planning regions/ Case study area	Working-age population by age-group								
	31.12.1990			31.12.2000			31.12.2007		
	20 – 64	20 – 39	40 – 64	20 – 64	20 – 39	40 – 64	20 – 64	20 – 39	40 – 64
Bochum	65.3	32.2	33.1	63.1	29.2	33.9	62.0	26.1	35.9
Dortmund	65.0	31.4	33.5	62.0	28.0	34.0	60.5	25.9	34.6
Hagen	63.4	30.0	33.4	59.9	26.3	33.7	57.4	23.2	34.1
Hamm	62.8	30.9	31.9	60.6	28.2	32.4	59.2	25.1	34.1
Herne	63.4	30.2	33.1	61.1	27.7	33.4	59.9	24.3	35.6
Ennepe-Ruhr-Kreis	64.3	30.2	34.1	61.5	26.8	34.7	59.1	22.5	36.6
Hochsauerlandkreis	61.5	30.8	30.7	58.9	27.4	31.6	57.2	23.1	34.0
Märkischer Kreis	63.2	30.8	32.4	60.5	27.4	33.1	58.3	23.1	35.1
Olpe	62.3	32.3	30.0	60.4	29.2	31.1	59.2	24.8	34.3
Siegen	63.0	31.6	31.4	60.7	27.8	32.8	59.3	24.5	34.8
Soest	62.3	31.6	30.7	60.3	28.1	32.2	58.7	23.9	34.8
Unna	64.0	31.1	32.9	61.2	27.4	33.8	59.2	23.1	36.1
Arnsberg	61.9	31.2	30.7	59.6	27.7	31.9	58.0	23.5	34.4
Bochum/Hagen	64.0	30.8	33.2	61.4	27.6	33.8	59.5	23.9	35.6
Dortmund	64.3	31.3	33.1	61.5	27.8	33.7	59.9	24.8	35.0
Siegen	62.8	31.8	31.0	60.6	28.3	32.3	59.3	24.6	34.7
Total	63.7	31.1	32.5	61.1	27.8	33.3	59.3	24.2	35.1

Source: BBSR, INKAR CD-Rom, 2009, and BBSR- Bevölkerungsprognose 2005-2025 data base, 2010.

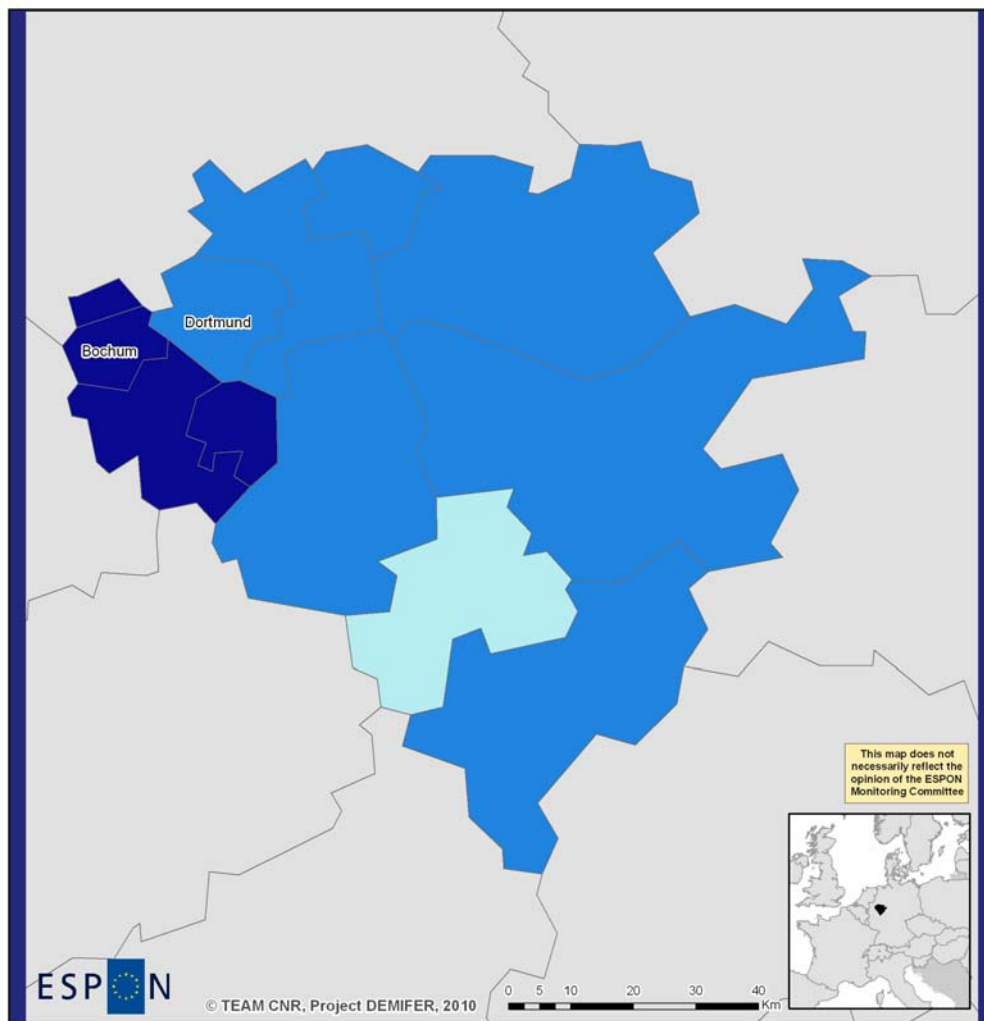
**Table 3 Changes in the age structure of the elderly population in the Southern Ruhr area (DEA5 Arnsberg), 1990, 2000 and 2007**

Counties/ Regional planning regions/ Case study area	Elderly population by age-group								
	31.12.1990			31.12.2000			31.12.2007		
	65+	75+	Women 65+ in %	65+	75+	Women 65+ in %	65+	75+	Women 65+ in %
Bochum (city)	16.6	7.5	67.1	18.8	8.1	62.1	21.1	9.5	59.3
Dortmund (city)	16.2	7.4	66.8	18.3	7.8	61.4	20.7	9.1	58.5
Hagen (city)	16.9	8.0	67.0	19.2	8.3	62.1	22.3	9.8	59.3
Hamm (city)	14.6	6.4	65.4	16.9	7.0	60.5	19.5	8.5	57.7
Herne (city)	17.0	7.5	67.2	19.1	8.2	62.2	21.4	10.0	59.4
Ennepe-Ruhr-Kreis	16.3	7.7	66.2	18.4	8.0	61.2	21.9	9.4	58.1
Hochsauerlandkreis	15.4	7.0	65.2	17.4	7.5	60.3	20.7	9.1	57.9
Märkischer Kreis	14.7	7.0	67.0	16.4	7.0	60.9	20.2	8.3	57.7
Olpe	13.3	6.0	65.2	15.2	6.3	60.4	18.2	7.8	57.7
Siegen-Wittgenstein	14.7	6.7	65.9	16.9	7.2	60.8	20.2	8.7	57.6
Soest	14.7	6.9	66.4	16.3	7.0	61.2	19.5	8.4	58.0
Unna	13.8	6.0	65.5	16.4	6.6	60.2	20.2	8.7	57.5
Arnsberg	15.0	7.0	65.8	16.8	7.2	60.7	20.1	8.7	58.0
Bochum/Hagen	16.1	7.5	66.9	18.1	7.8	61.6	21.2	9.2	58.6
Dortmund	15.1	6.8	66.2	17.4	7.2	60.9	20.3	8.8	58.0
Siegen	14.3	6.5	65.7	16.3	6.9	60.6	19.6	8.4	57.6
Total	15.4	7.1	66.4	17.5	7.4	61.1	20.6	8.9	58.2

Source: BBSR, INKAR CD-Rom, 2009, and BBSR- Bevölkerungsprognose 2005-2025 data base, 2010.

The share of the elderly increased between 1990 and 2007 in the study area by more than 5 percentage points. The imbalance between men and women among the elderly decreased, because the older cohorts in which many men died during World War II are disappearing. The regional variations of the share of elderly women are quite limited.

**Map 3 Population 65 and older in the Southern Ruhr area (DEA5 Arnsberg), 1.1.2008**



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0 5 10 20 30 40 Km

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Local level: NUTS3

Source: BBSR, INKAR CD-Rom, 2009

Origin of data: Federal Statistical Offices, 2009

© EuroGeographics Association for administrative boundaries

### Legend

#### Population 65 years and older 31.12.2007 (in %)

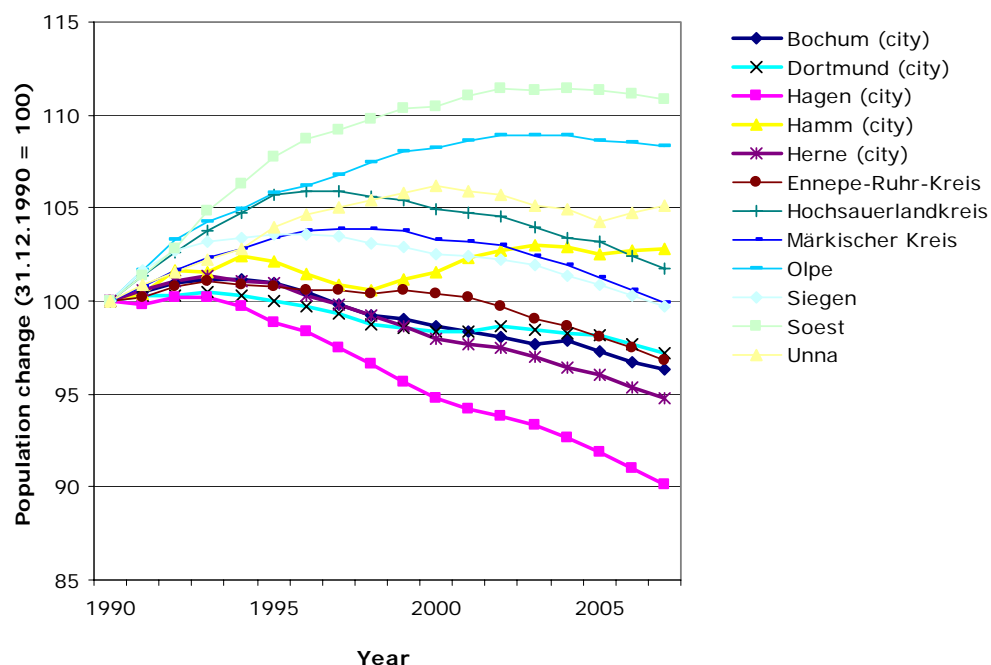
- 19.0 and less
- 19.0 to 21.0
- more than 21.0

### 3.2. Population change and its components

Since 1990 the population of the study area Arnsberg diminished only slightly from 3,817 in 1990 thousand to 3,730 thousand in 2007. However, the sub-areas followed slightly different paths. The city of Hagen lost population, whereas the counties of Olpe and Soest showed a slight increase. In the 1990s and 2000s the Southern Ruhr area is characterised with a slight natural population loss and a slight migration loss. The migration gains are in most cases due to sub-urban changes of residence inside the study area. Perhaps with the exception of Unna

in the 1990s, when there a state establishment to assist ethnic Germans arriving in Germany was located in this county.

**Figure 2 Population change in the Southern Ruhr area (DEA5 Arnsberg), 1990-2005**



Source: BBSR, INKAR CD-Rom, 2009, and BBSR- Bevölkerungsprognose 2005-2025 data base, 2010.

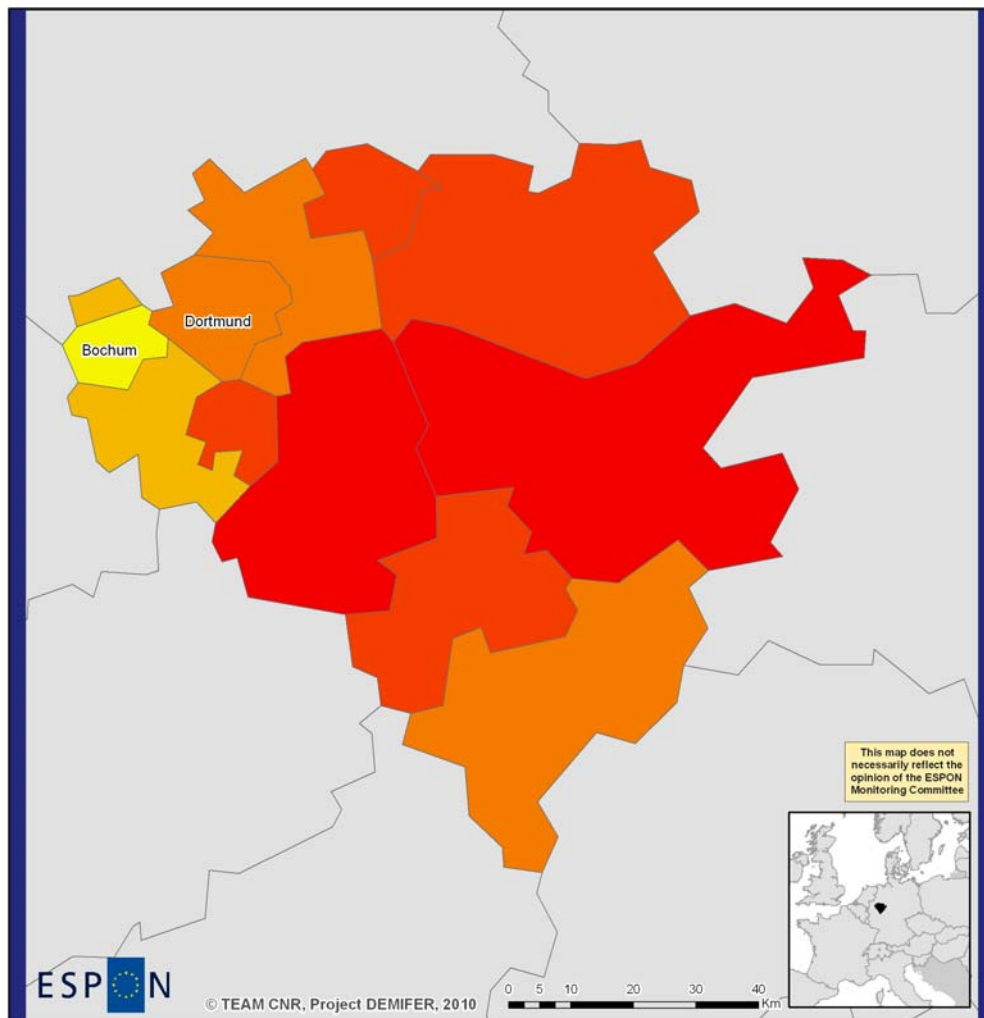
**Table 4 Population change and its components in the Southern Ruhr area (DEA5 Arnsberg), 2000-2008**

Counties/ Regional planning regions/ Case study area	Population, natural change and net migration											
	1.1. 1995		1995 – 1999		1.1. 2000		2000 – 2004		1.1. 2005		2005 – 2007	31.12. 2007
	Pop	Nat	Mig	Pop	Nat	Mig	Pop	Nat	Mig	Pop		
Bochum (city)	401,128	-3.6	-0.6	392,829	-3.7	1.3	388,182	-3.9	-1.8	381,743		
Dortmund (city)	600,918	-2.0	-1.6	590,210	-2.9	2.3	588,683	-3.1	2.1	582,508		
Hagen (city)	213,754	-1.7	-6.5	205,199	-2.5	-3.9	198,778	-3.7	-4.9	193,365		
Hamm (city)	184,016	0.5	-3.0	181,802	-0.3	3.7	184,930	-2.2	-1.2	184,678		
Herne (city)	180,029	-3.2	-1.8	175,663	-3.8	-0.6	171,833	-4.4	-2.3	168,780		
Ennepe-Ruhr-Kreis	352,616	-2.9	2.2	351,415	-3.8	0.0	344,825	-4.8	-1.5	338,402		
Hochsauerlandkreis	281,305	0.6	0.7	283,055	-0.7	-3.1	277,715	-2.0	-2.6	273,229		
Märkischer Kreis	455,311	-0.4	2.2	459,613	-1.3	-2.3	451,422	-2.1	-5.2	442,712		
Olpe	136,924	1.9	3.9	140,923	0.9	0.8	142,140	-0.7	-2.1	141,315		
Siegen-Wittgenstein	298,610	-0.2	-0.8	297,207	-1.4	-1.6	292,870	-2.3	-2.8	288,176		
Soest	294,829	-0.1	7.6	306,129	-1.3	3.1	309,011	-1.9	-0.1	307,311		
Unna	417,897	-0.2	6.0	430,209	-1.3	-0.5	426,343	-2.6	-2.9	427,326		
Arnsberg	576,134	0.2	4.3	589,184	-1.0	0.1	586,726	-1.9	-1.3	580,540		
Bochum/Hagen	1,602,838	-2.2	-0.1	1,584,719	-2.9	-0.9	1,555,040	-3.6	-3.2	1,525,002		
Dortmund	1,202,831	-1.0	0.9	1,202,221	-1.9	1.5	1,199,956	-2.8	-0.2	1,194,512		
Siegen	435,534	0.5	0.7	438,130	-0.7	-0.8	435,010	-1.8	-2.5	429,491		
Total	3,817,337	-1.1	1.0	3,814,254	-2.0	0.0	3,776,732	-2.9	-1.9	3,729,545		

Source: BBSR, INKAR CD-Rom, 2009

### 3.3. Natural change - fertility and mortality

Map 4 TFR in the Southern Ruhr area (DEA5 Arnsberg), 2007



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Local level: NUTS3  
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#### Legend

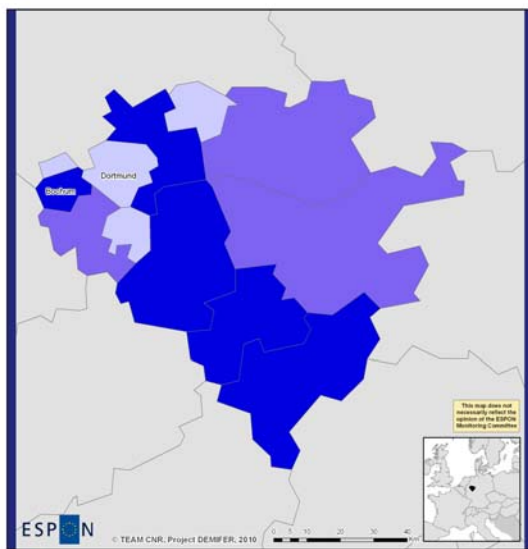
##### Total fertility rate 2007 (children per women)

Yellow	1.2 and less
Light Orange	1.2 to 1.3
Orange	1.3 to 1.4
Dark Orange	1.4 to 1.5
Red	more than 1.5

Regional differences in fertility are more pronounced in the Southern Ruhr area: in the county TFR is estimated at 1.17 in 2007, whereas the counties of the Sauerland reach 1.5 children per women. Since 1995 TFR declined slightly in all sub-areas.



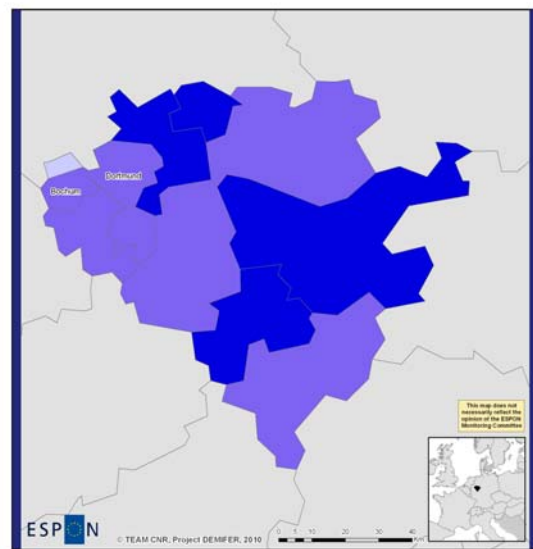
**Map 5 Life expectancy for men and women in the Southern Ruhr area (DEA5 Arnsberg), 2007**



**Legend**

Life expectancy at birth of men 2007 (years)

- 76.0 and less
- 76.0 to 77.0
- more than 77.0



**Legend**

Life expectancy at birth of women 2007 (years)

- 81.0 and less
- 81.0 to 82.0
- more than 82.0

The local differences in life expectancy do exist, but it seems difficult to recognize a pattern. At a more aggregated level regional differences disappear. Life expectancy for men and women in the study area are at an average level for German standards.



### 3.4. Net migration

**Table 5 Interregional- and international migration in the Southern Ruhr area (DEA5 Arnsberg), 2000-2008**

Counties/ Regional planning regions/ Case study area	Out- and in-migration, net internal- and international migration rates (per 1,000)									
	2000 – 2004					2005 – 2007				
	Out-	In-	Net inter- nal	Net inter- natio- nal	Net total	Out-	In-	Net inter- nal	Net inter- natio- nal	Net total
Bochum (city)	36.4	37.7	0.3	1.1	1.3	39.5	37.7	-1.8	-0.1	-1.8
Dortmund (city)	36.0	38.4	-1.9	4.2	2.3	35.2	37.3	0.2	1.8	2.1
Hagen (city)	33.6	29.7	-3.6	-0.3	-3.9	34.1	29.3	-3.5	-1.3	-4.9
Hamm (city)	38.7	42.4	-12.1	15.8	3.7	29.6	28.4	-2.5	1.3	-1.2
Herne (city)	31.9	31.4	-1.5	0.9	-0.6	31.9	29.6	-2.8	0.5	-2.3
Ennepe-Ruhr-Kreis	32.9	32.8	0.4	-0.4	0.0	31.5	30.0	-1.4	-0.1	-1.5
Hochsauerlandkreis	29.1	26.0	-1.3	-1.8	-3.1	27.6	25.0	-3.6	0.9	-2.6
Märkischer Kreis	32.0	29.7	-5.5	3.2	-2.3	29.7	24.5	-6.3	1.2	-5.2
Olpe	24.5	25.3	1.2	-0.4	0.8	24.8	22.7	-1.3	-0.8	-2.1
Siegen-Wittgenstein	27.3	25.7	-1.6	0.0	-1.6	27.3	24.6	-2.9	0.2	-2.8
Soest	25.8	29.0	3.5	-0.4	3.1	27.0	26.8	0.5	-0.6	-0.1
Unna	77.6	77.0	-7.4	6.9	-0.5	38.4	35.4	-4.5	1.6	-2.9
Arnsberg	27.4	27.6	1.2	-1.0	0.1	27.2	25.9	-1.5	0.1	-1.3
Bochum/Hagen	33.5	32.6	-2.1	1.2	-0.9	33.3	30.2	-3.3	0.2	-3.2
Dortmund	51.3	52.8	-5.4	6.9	1.5	35.5	35.3	-1.9	1.7	-0.2
Siegen	26.4	25.5	-0.7	-0.1	-0.8	26.5	24.0	-2.4	-0.1	-2.5
Total	37.3	37.4	-2.5	2.5	0.0	32.3	30.4	-2.5	0.6	-1.9

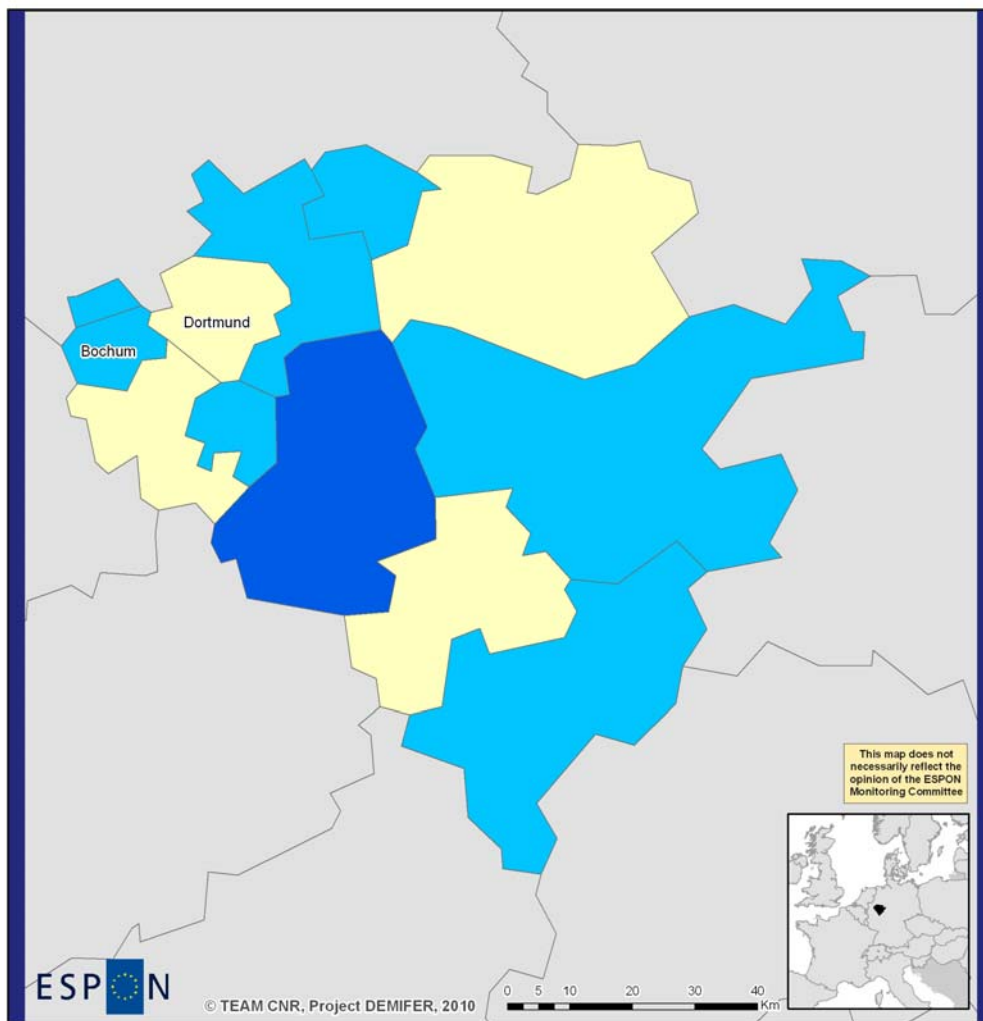
Source: BBSR, INKAR CD-Rom, 2009.

The level of mobility – the out- and in-migration rates - are relative low in the study area, leading to small migration gains (international) and small migration losses (internally) and to an overall migration balance close to nil. Exceptions are the artificial high values for Unna and Hamm, due to the existence of the state establishment to 'process' ethnic Germans immigrating in Germany.

Map 6 highlights the internal migration loss of the Märkischer Kreis, whereas the other counties have a light loss or balanced interregional migration flows.

Net international migration rates show a more varied picture. International migration gains or losses reflect probably the economic difficulties in the counties and strains on the labour market, as well as the fact that more foreigners reside in these counties, foreigners who are potential return migrants.

**Map 6 Net interregional migration in the southern Ruhr area (DEA5 Arnsberg), 2007**



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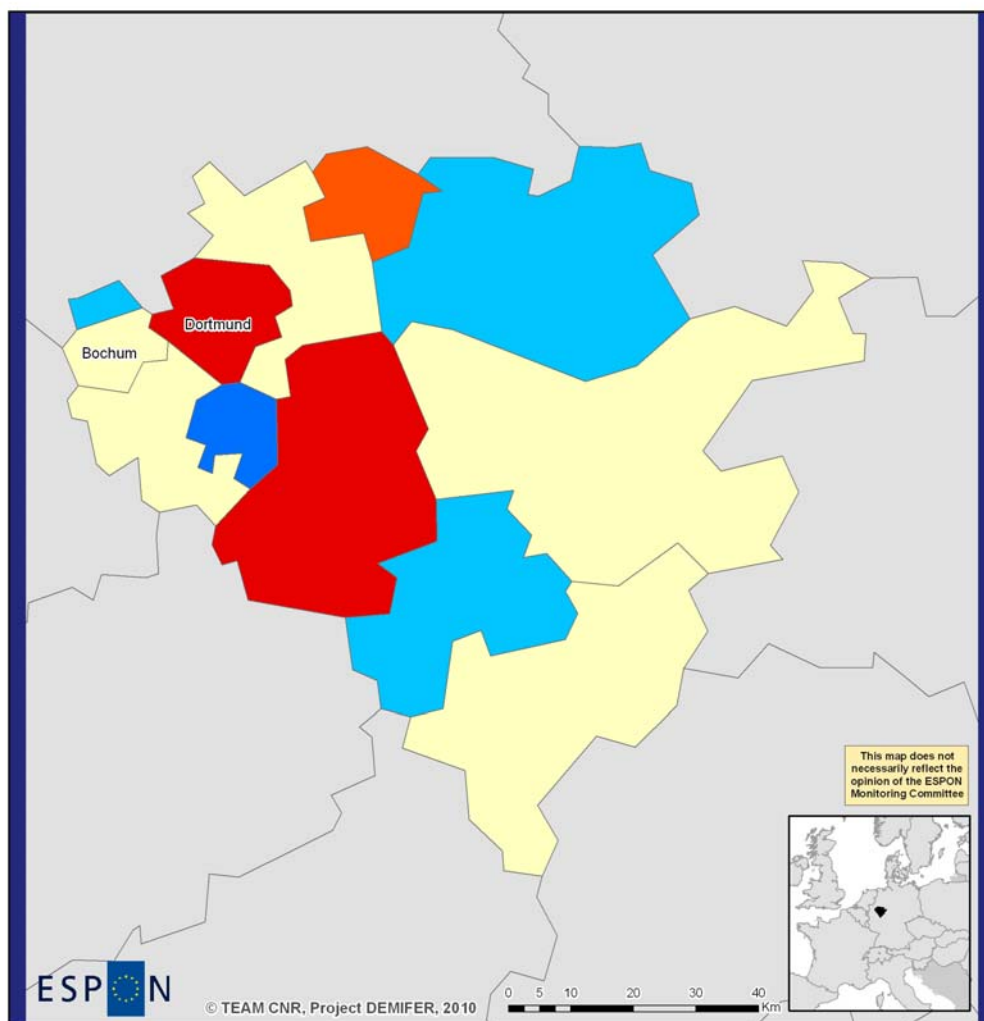
Local level: NUTS3  
Source: BBSR, INKAR CD-Rom, 2009  
Origin of data: Federal Statistical Offices, 2009  
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**Legend**

**Net interregional migration 2007 (in ‰)**

- 4.5 and less
- 4.5 to -1.5
- 1.5 to +1.5
- +1.5 to +4.5
- more than +4.5

**Map 7 Net international migration in the southern Ruhr area (DEA5 Arnsberg), 2007**



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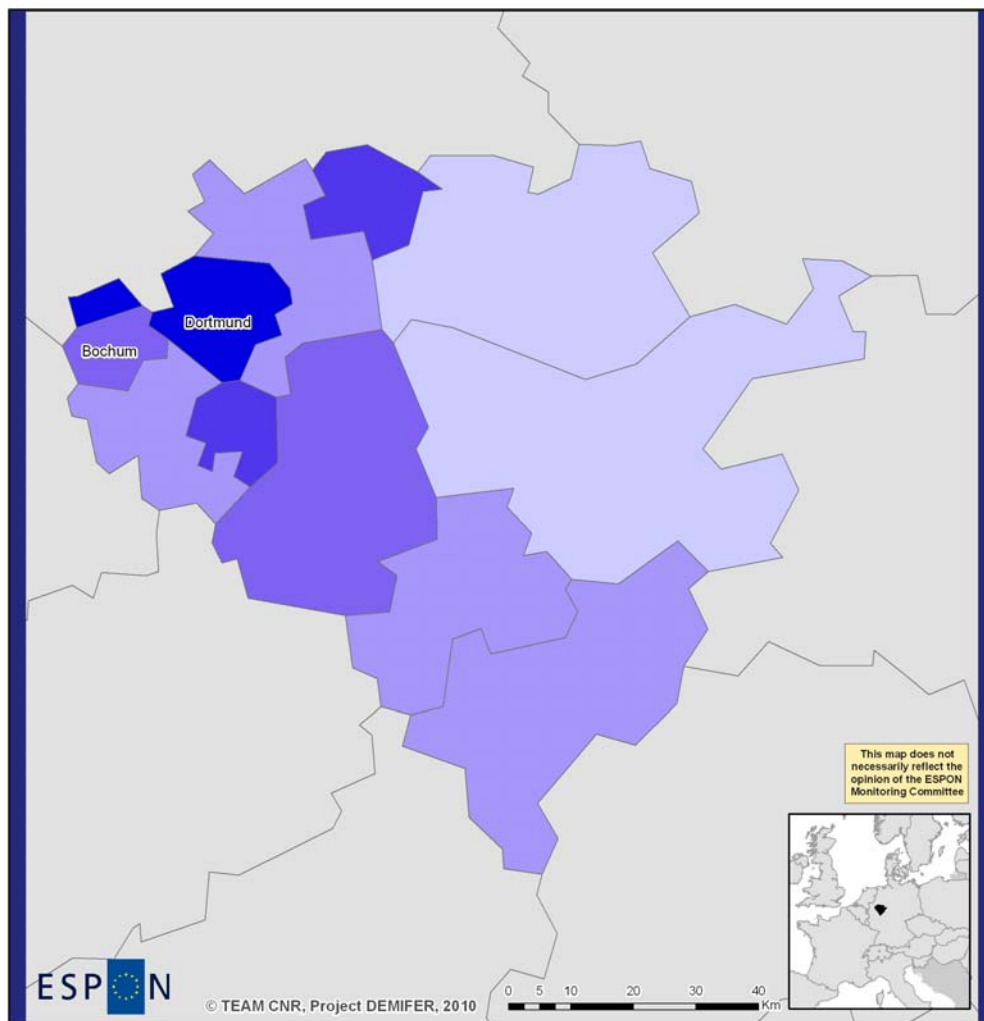
Local level: NUTS3  
Source: BBSR, INKAR CD-Rom, 2009  
Origin of data: Federal Statistical Offices, 2009  
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**Legend**

**Net international migration 2007 (in %)**

- 1.5 and less
- 1.5 to -0.5
- 0.5 to +0.5
- +0.5 to +1.5
- more than +1.5

**Map 8 Foreign population in the Southern Ruhr area (DEA5 Arnsberg), 1.1.2007**



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### Legend

#### Foreign population 31.12.2007 (in %)



The share of the foreign population in the NUTS2 region of Arnsberg lies above 9 %. The foreign population is concentrated in the cities of the Ruhr agglomeration – Dortmund, Hagen, Hamm and Herne. Also the Märkischer Kreis has a high share of foreign population.

### 3.5. Age composition of migrants

**Table 6 Interregional- and international age-specific migration rates in the Southern Ruhr area (DEA5 Arnsberg), 2007**

Counties/ Regional planning regions/ Case study area	Internal net migration rates for age-groups (per 1,000)									
	2000 - 2004					2005 - 2007				
	18 - 24	25 - 29	18, 30 - 49	50 - 64	65+	18 - 24	25 - 29	18, 30 - 49	50 - 64	65+
Bochum (city)	31.0	18.8	-4.3	-2.7	-3.9	36.9	-9.9	-6.5	-2.2	-3.7
Dortmund (city)	19.8	-1.7	-4.8	-1.5	-4.0	27.1	-1.7	-2.3	-1.3	-3.1
Hagen (city)	0.7	-6.3	-2.6	-2.8	-7.6	-6.8	-7.9	-1.9	-3.1	-5.0
Hamm (city)	-31.0	-39.2	-12.6	-1.9	-2.9	-10.2	-11.1	-1.7	-0.5	-0.9
Herne (city)	3.5	-4.1	-1.2	-1.6	-3.8	-3.4	-6.3	-4.1	-1.3	-2.3
Ennepe-Ruhr-Kreis	-3.0	-5.7	2.0	-1.3	0.8	-8.8	-5.6	0.4	-1.9	-1.4
Hochsauerlandkreis	-18.4	-11.2	1.0	1.6	-0.4	-27.3	-16.3	-0.8	0.5	-1.0
Märkischer Kreis	-26.5	-21.7	-3.3	-1.8	-1.5	-27.4	-22.2	-4.4	-2.7	-1.7
Olpe	-8.2	-1.0	3.4	0.6	0.3	-19.9	-6.8	1.3	0.0	0.4
Siegen-Wittgenstein	-0.9	-9.0	-1.0	-0.9	-2.2	-4.9	-11.1	-2.0	-1.8	-2.8
Soest	-9.8	-1.9	4.9	3.7	7.0	-18.4	-7.2	2.3	2.4	4.1
Unna	-19.9	-17.4	-4.6	-9.3	-5.1	-22.6	-11.4	-2.5	-4.5	-1.3
Arnsberg	-13.8	-6.3	3.1	2.7	3.4	-22.6	-11.4	0.8	1.5	1.6
Bochum/Hagen	-0.1	-3.2	-2.0	-2.0	-2.6	-1.9	-11.7	-3.4	-2.3	-2.6
Dortmund	-2.1	-12.8	-5.9	-4.4	-4.2	4.3	-6.1	-2.2	-1.9	-2.2
Siegen	-3.3	-6.4	0.5	-0.4	-1.5	-9.7	-9.7	-0.9	-1.2	-1.8
Total										

Source: BBSR, INKAR CD-Rom, 2009.

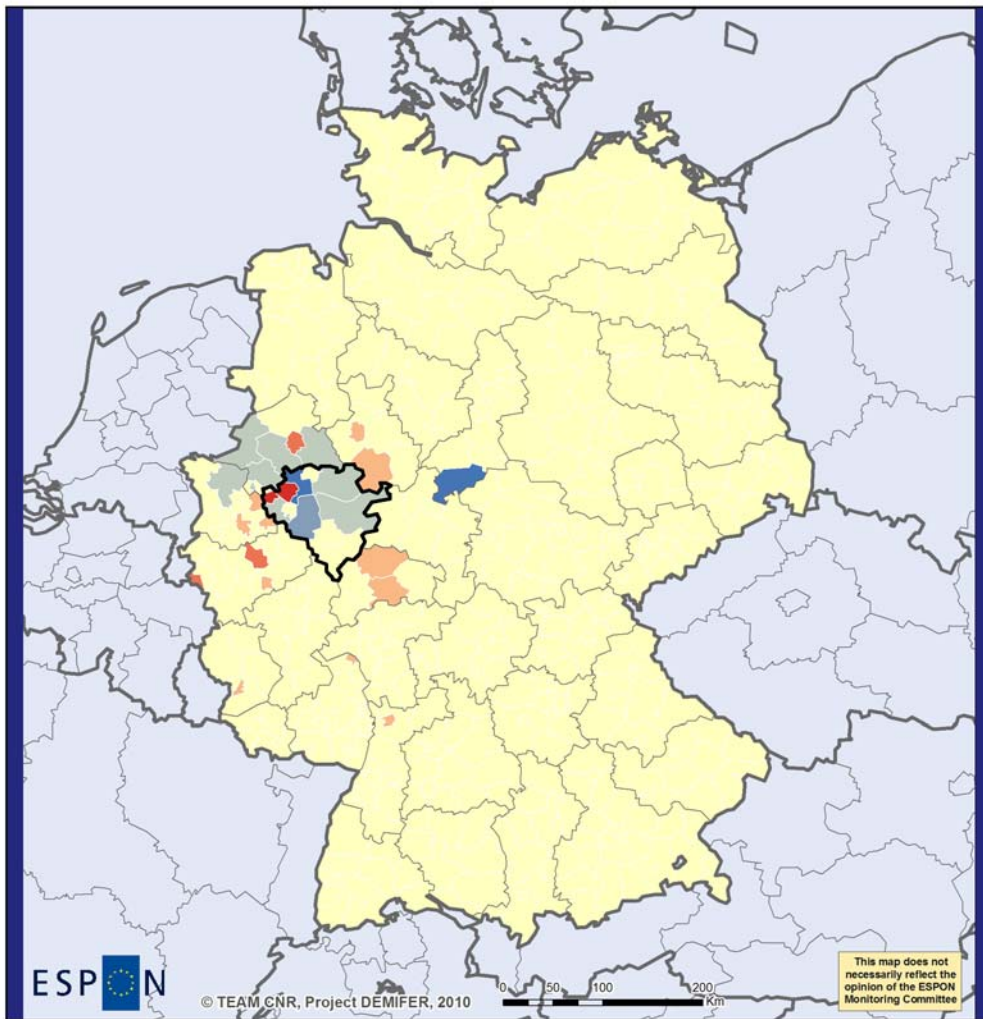
Migration gains and losses are concentrated in the age group of young adults. With the university cities of Dortmund and Bochum attracting migrants in this age group.

### 3.6. The regional pattern of internal migration

The maps 9 to 11 show the interregional migration fields of the single case study areas. They show how each German county is related in the case of different age groups to the case study area. Inside the case study area it is shown, which county gains or loses population inside the study area.

Most German counties receive population from the NUTS2 region of Arnsberg. Only the county of Göttingen, where the federal institution to welcome ethnic Germans immigrating to Germany is located, has a negative migration balance in most age groups.

**Map 9 Net internal migration of the 18 to 24 years old population with the Southern Ruhr area (DEA5 Arnsberg), 2005-2007**











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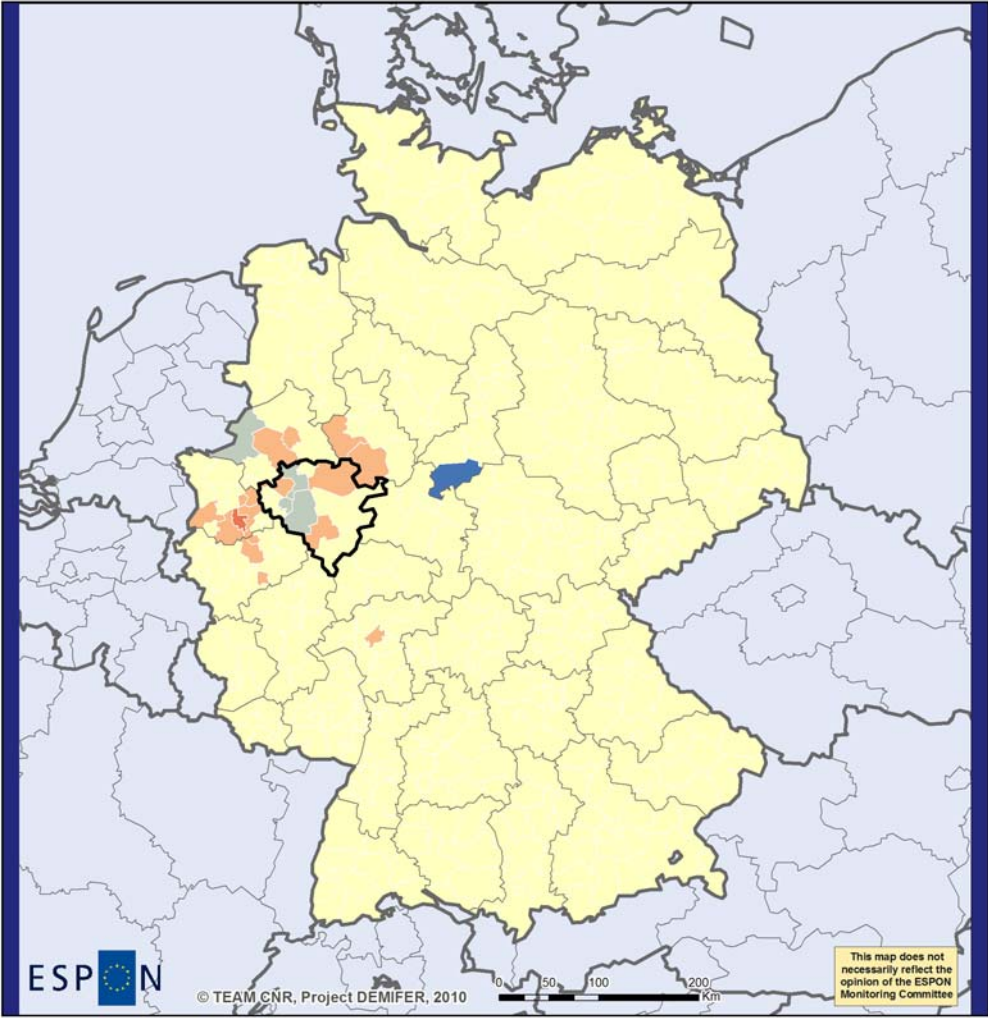
**Legend**

**Net migration of 18 to 24 years old with CS 4, 2005-2007 (per 1,000)**

-  -10.0 and less
-  -10.0 to -6.0
-  -6.0 to -2.0
-  -2.0 to +2.0
-  +2.0 to +6.0
-  +6.0 to +10.0
-  more than +10.0



**Map 10 Net internal migration of the 25 to 29 years old population with the Southern Ruhr area (DEA5 Arnsberg), 2005-2007**







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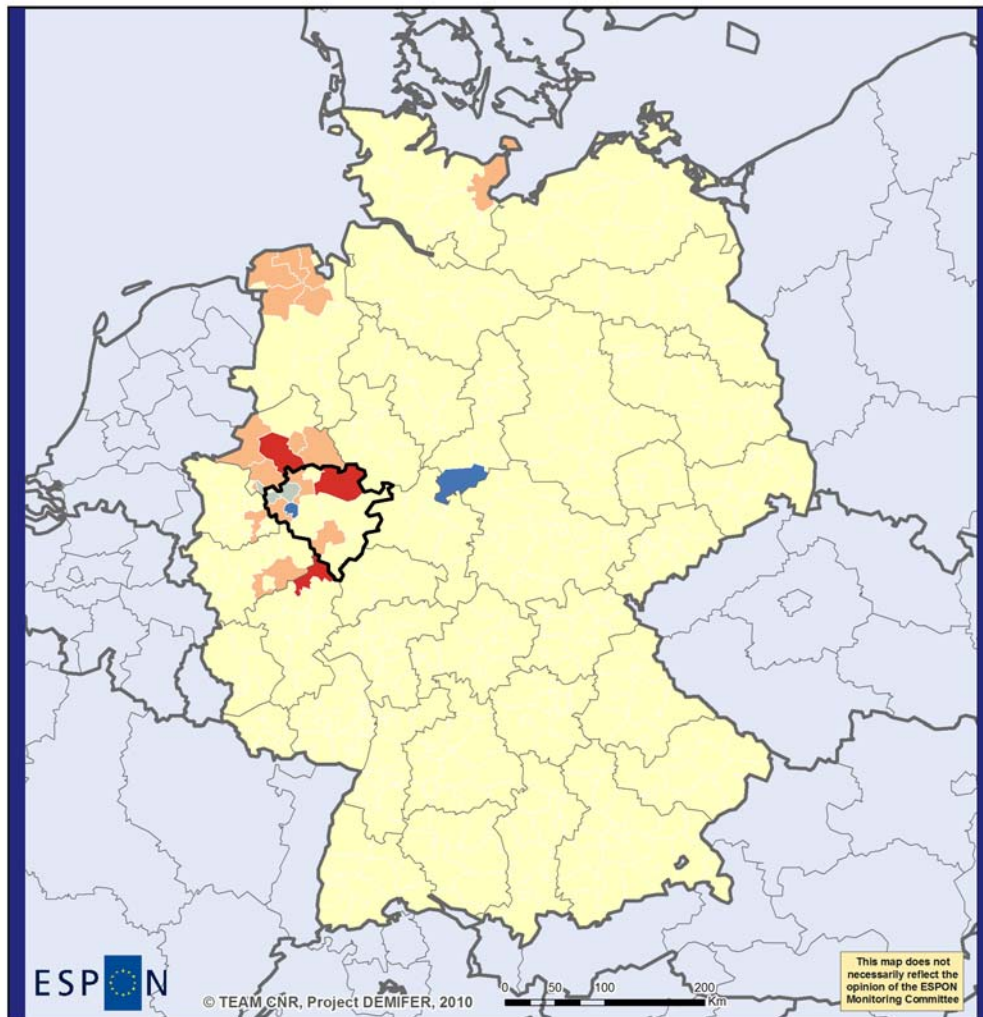
Local level: NUTS3  
 Source: BBSR, INKAR CD-Rom, 2009  
 Origin of data: German Federal Statistical Offices, 2009  
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**Legend**

**Net migration of 25 to 29 years old with CS 4, 2005-2007 (per 1,000)**

-  -10.0 and less
-  -10.0 to -6.0
-  -6.0 to -2.0
-  -2.0 to +2.0
-  +2.0 to +6.0
-  +6.0 to +10.0
-  more than +10.0

**Map 11 Net internal migration of the population 65 years and older with the Southern Ruhr area (DEA5 Arnsberg), 2005-2007**

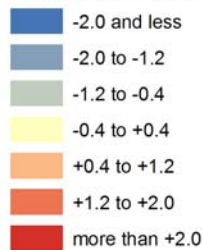


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### Legend

Net migration of 65 years and older with CS 4, 2005-2007 (per 1,000)



### 3.7. The foreign population by nationality



**Table 7 Foreign population by nationality in the Southern Ruhr area (DEA5 Arnsberg), 31.12.2005**

Counties/ Regional planning regions/ Case study area	Foreign population 31.12.2005						
	Total	By country of citizenship (in % of the total number of foreign citizens)					
		abs	in %	Europe	Turkey	Italy	Poland
Bochum (city)	32,976	8.6	77.7	32.6	5.0	7.1	3.5
Dortmund (city)	80,865	13.7	81.5	34.8	4.3	6.0	5.2
Hagen (city)	27,170	13.8	89.8	34.9	12.8	4.7	12.1
Hamm (city)	20,063	10.9	87.3	55.4	2.6	8.6	0.9
Herne (city)	19,979	11.7	87.6	59.1	4.1	4.8	5.0
Ennepe-Ruhr-Kreis	28,362	8.3	87.1	28.6	12.3	5.2	7.9
Hochsauerlandkreis	17,636	6.4	86.3	23.8	11.6	4.0	4.1
Märkischer Kreis	42,882	9.6	89.3	37.6	10.6	4.6	14.8
Olpe	9,759	6.9	89.5	31.0	13.5	3.4	10.2
Siegen-Wittgenstein	22,544	7.7	79.3	24.9	8.1	5.7	2.1
Soest	20,224	6.5	82.2	17.1	14.9	5.6	6.7
Unna	27,662	6.5	85.4	49.9	4.3	5.8	2.0
Arnsberg	37,860	6.5	84.1	20.2	13.4	4.9	5.5
Bochum/Hagen	151,369	9.8	86.2	37.2	9.2	5.3	9.3
Dortmund	128,590	10.7	83.2	41.2	4.0	6.4	3.9
Siegen	32,303	7.5	82.4	26.7	9.7	5.0	4.5
Total	350,122	9.3	84.5	35.9	7.8	5.6	6.4

Source: BBSR, INKAR CD-Rom, 2009.

As the share of 9.3 % of foreign population testifies, international immigration to the case study area played a significant role in the past. The social networks of the foreign population can lead to further immigration flows in the future should the economic situation be favourable.

**Table 8 Population by migratory status in the Southern Ruhr area (DEA5 Arnsberg), 2005-2008**

	Population							
	Total	without migratory 'back-ground'	With migratory 'back-ground'	with migratory 'background' (narrow definition)				
				Total	German citizens		Foreign citizens	
					with	without	with	without
				own migratory experience				
Case study area	absolute values							
2005	3,771	2,867	905	892	303	173	290	127
2006	3,754	2,863	891	891	305	173	289	124
2007	3,736	2,812	924	924	316	200	301	108
2008	3,717	2,796	920	920	309	205	293	112
Dortmund								
2005	588	423	165	163	45	31	61	25
Case study area	relative values (in %)							
2005	100.0	76.0	24.0	23.7	8.0	4.6	7.7	3.4
2006	100.0	76.3	23.7	23.7	8.1	4.6	7.7	3.3
2007	100.0	75.3	24.7	24.7	8.5	5.4	8.1	2.9
2008	100.0	75.2	24.8	24.8	8.3	5.5	7.9	3.0
Dortmund								
2005	100.0	71.9	28.1	27.7	7.7	5.3	10.4	4.3
Germany	relative values (in %)							
2005	100.0	81.4	18.6	18.3	5.9	3.5	6.8	2.1
2006	100.0	81.6	18.4	18.4	5.9	3.6	6.8	2.1
2007	100.0	81.3	18.7	18.7	6.0	3.9	6.8	2.1
2008	100.0	81.0	19.0	19.0	6.1	4.0	6.8	2.0

Source: elaborations on StaBu, Micro census, various years.

## 4. Economic change and population: the labour market of the case study region and its sub-divisions

### 4.1. Economic characteristics

Using gross domestic product (GDP) as an indicator for economic output and GDP's change in time as an indicator for economic growth, we may characterise the economic situation and its change in the counties of the case study region. Germany's GDP was – in the average of the last decade – about a quarter higher than that of the EU-27. But since the year 2000 the growth of German GDP was weaker than in Europe. In 2007 the GDP (Purchasing Power Standard per inhabitant) of Arnsberg amounted to 26,500 €. It is 6 % above the EU-27 average, 10 % points below the German national level and 9 % points below the NUTS1 region North Rhine-Westphalia.

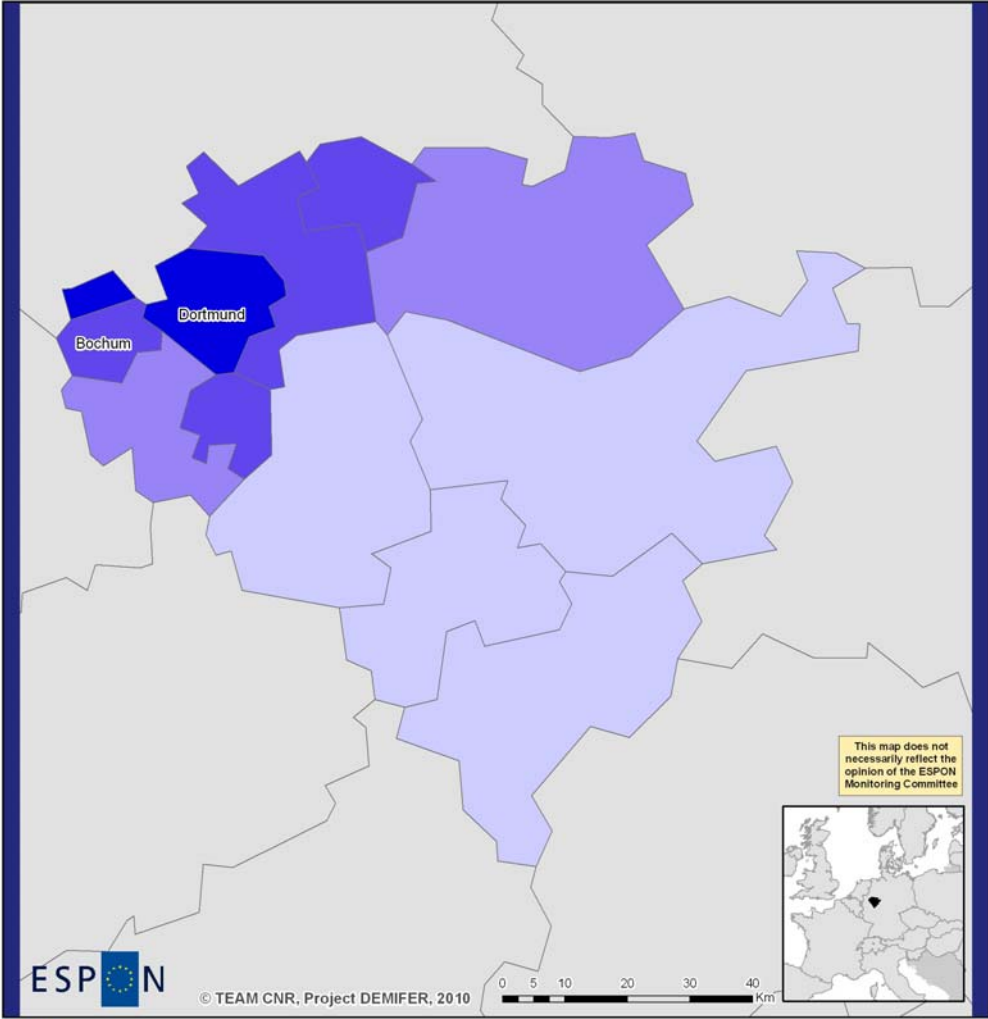
Within Arnsberg the variation of GDP is considerable. The gradient between the counties shows a certain relationship to the urban systems – but not in a linear way, but in the form of an U: The larger cities of Dortmund and Bochum are leading the ranking, both having GDPs per capita far above the average of the region, even higher than the national level. At the other end of the range we find the smaller cities of the Ruhr agglomeration like Hamm, Unna and Herne, because of a delay in modernisation and a slower shift to the service sector.

**Table 9 The economic situation in the Southern Ruhr area (DEA5 Arnsberg)**

Counties/ Regional planning regions/ Case study area	GDP 2008		Change in GDP			Unemployment 2007	
	€ per capita	Case study = 100	1995 to 2000	2000 to 2005	2005 to 2008	in %	Case study = 100
Bochum (city)	31,074	109.1	9.9	0.5	8.1	12.6	115.3
Dortmund (city)	32,627	114.6	6.6	21.4	7.8	15.8	144.6
Hagen (city)	32,415	113.9	10.5	5.7	16.6	13.1	119.9
Hamm (city)	23,733	83.4	2.8	11.9	14.1	12.1	110.7
Herne (city)	20,131	70.7	-6.5	8.1	14.6	15.6	142.8
Ennepe-Ruhr-Kreis	24,989	87.8	13.1	7.7	14.7	9.2	84.2
Hochsauerlandkreis	27,968	98.2	8.1	5.1	13.0	7.3	66.8
Märkischer Kreis	29,253	102.8	13.6	3.8	13.4	7.8	71.4
Olpe	31,825	111.8	15.8	10.9	15.2	5.5	50.3
Siegen-Wittgenstein	33,449	117.5	11.4	6.5	19.0	7.4	67.7
Soest	26,794	94.1	12.8	0.7	14.7	8.9	81.4
Unna	22,857	80.3	5.9	13.7	14.9	12.2	111.6
Arnsberg	28,470	100.0	9.1	8.4	12.9	10.9	100.0

Source: elaborations on AGL, 2010, and BBSR, INKAR CD-Rom, 2009.

Map 12 Unemployment in the Southern Ruhr area (DEA5 Arnsberg), 2007



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**Legend**

**Unemployment rate 2007 (in %)**

- 8.0 and less
- 8.0 to 11.0
- 11.0 to 14.0
- more than 14.0

## 4.2. Changes in the working age population

The case study area of Arnsberg had at the end of 2005 approximately 2,5 millions inhabitants in working age, representing 2/3 of the total population. The share of the working age population over the counties is quite homogeneous. Close to half of the population is living in counties with an activity rate between 65.0 and 65.6 %. The minimum is observed in Hagen with 63.6 % and the maximum in Bochum with 76.1 %. By 2025 total population and working age population will have diminished and the share of the working age population will be reduced to 63 %. The disparities among the counties are supposed to diminish. But the decline of the absolute number in working age population is not the most significant change, but the ageing of the working age population. The passage of differently numerous cohorts, resulting predominantly from the changes in fertility in the past (baby boom or decline in fertility in the 1970s): these cohorts pass through the labour market and are causing an increase in the older working age population (45 to 65 years old) and a decrease of the younger (15 to 30 years old) and the 30 to 45 years old working age population. The ageing of the potential economically active population will have numerous consequences. The contest for a young and qualified labour force between the counties of the case study area will increase. The case study area of Arnsberg will have to exploit to a larger extent the existent labour force potential and to assure an improved qualification of the working age population. A better formal and professional qualification will guarantee and improve the productivity of the labour force.

**Table 10 Working age population and its dynamic in the Southern Ruhr area (DEA5 Arnsberg), 2000-2007**

Counties/ Regional planning regions/ Case study area	Working age population											
	31.12.2007				31.12.1990 (31.12.2007=100)				31.12.2023 (31.12.2007=100)			
	Total	15- 29	30- 44	45- 64	15- 29	30- 44	45- 64	15- 64	15- 29	30- 44	45- 64	15- 64
Bochum (city)	256,132	26.7	33.1	40.2	124	102	103	108	88	93	97	93
Dortmund (city)	382,665	27.5	32.4	40.2	122	103	106	109	90	91	95	92
Hagen (city)	122,660	27.1	31.6	41.3	136	111	116	120	85	82	92	87
Hamm (city)	120,884	27.5	33.2	39.3	121	94	96	102	92	94	111	100
Herne (city)	110,570	25.5	33.1	41.4	134	102	104	111	85	82	100	90
Ennepe-Ruhr-Kreis	219,418	24.6	32.7	42.7	135	102	103	110	83	80	101	90
Hochsauerlandkreis	173,949	26.9	32.7	40.4	132	94	95	105	81	75	104	88
Märkischer Kreis	287,122	26.8	32.5	40.7	128	97	99	106	82	79	102	89
Olpe	93,039	27.8	34.0	38.3	120	85	88	96	86	83	115	96
Siegen-Wittgenstein	188,811	28.1	31.8	40.1	124	100	96	105	81	87	101	91
Soest	200,364	26.9	33.2	40.0	120	86	85	95	84	81	111	94
Unna	280,799	26.2	32.0	41.8	121	98	91	101	92	94	115	102
Arnsberg	374,313	26.9	33.0	40.1	126	89	90	99	82	78	108	91
Bochum/Hagen	995,902	26.2	32.7	41.2	130	102	103	110	85	84	99	90
Dortmund	784,348	27.0	32.4	40.6	122	100	99	105	91	92	105	97
Siegen	281,850	28.0	32.5	39.5	123	95	94	102	83	86	105	93
<b>Total</b>	<b>2,436,413</b>	<b>26.8</b>	<b>32.6</b>	<b>40.6</b>	<b>126</b>	<b>98</b>	<b>99</b>	<b>106</b>	<b>86</b>	<b>86</b>	<b>103</b>	<b>93</b>

Source: BBSR, INKAR CD-Rom, 2009, and BBSR- Bevölkerungsprognose 2005-2025 data base, 2010.

### 4.3. The role of migration

**Table 11 Foreigners employed and unemployed in the Southern Ruhr area (DEA5 Arnsberg), 2007**

Counties/ Regional planning regions/ Case study area	Foreigners - employed (social insurance)	Foreigners - employed as share of total employed	Foreigners - unemployed
Bochum (city)	257.3	7.2	109.6
Dortmund (city)	189.3	7.4	132.9
Hagen (city)	330.2	9.6	159.1
Hamm (city)	173.5	6.8	93.3
Herne (city)	156.3	7.0	122.8
Ennepe-Ruhr-Kreis	385.1	8.8	106.4
Hochsauerlandkreis	339.7	5.7	85.1
Märkischer Kreis	372.5	10.4	80.4
Olpe	385.5	7.5	58.7
Siegen-Wittgenstein	277.4	5.4	75.3
Soest	280.9	5.3	100.8
Unna	236.2	6.5	130.4
Arnsberg	307.7	5.5	93.6
Bochum/Hagen	307.1	8.8	109.3
Dortmund	197.5	7.0	125.9
Siegen	312.5	6.1	69.9
Total			

Source: BBSR, INKAR CD-Rom, 2009.

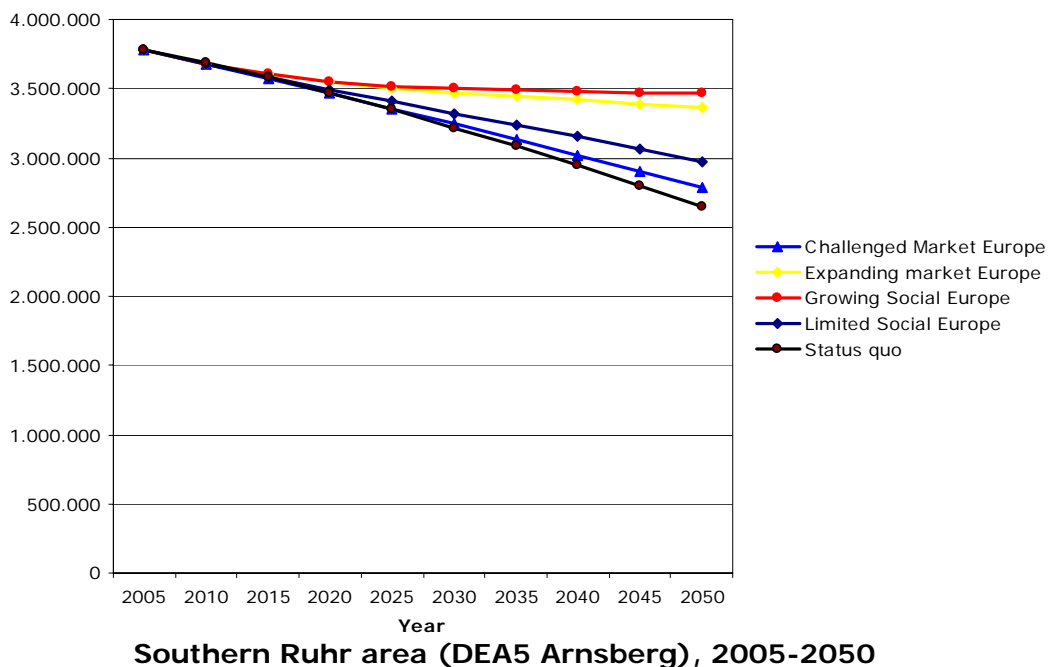
## 5. Economic change and population: other aspects of the case study region and its sub-divisions

The process of economic restructuring in the Ruhr valley and its consequences

## 6. Economic and social consequences of demographic change in the case study region and its sub-divisions

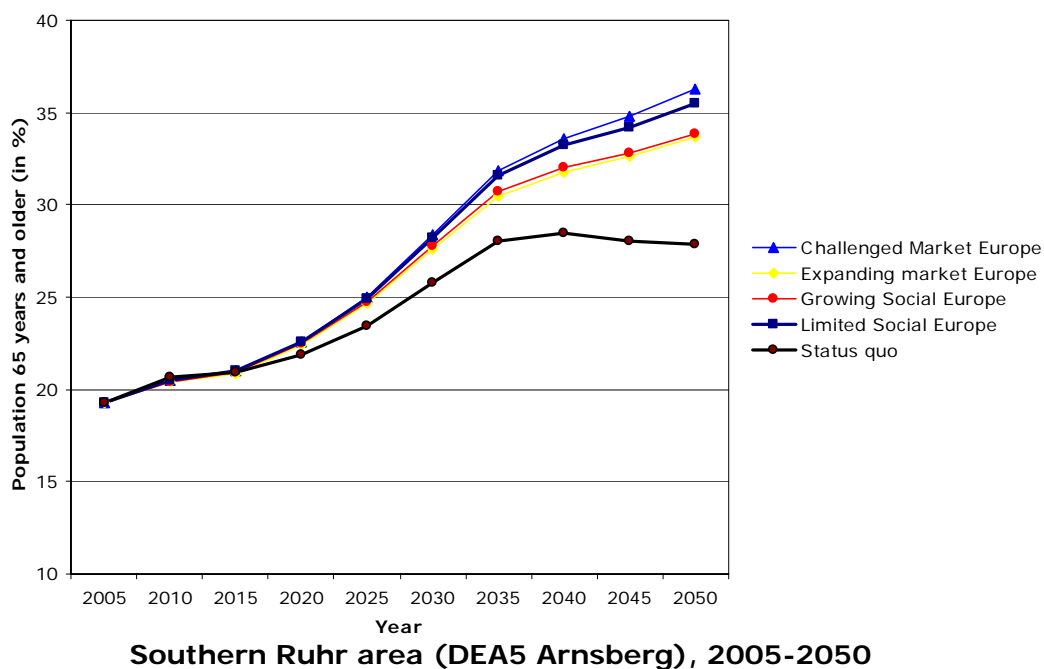
## 7. Population ageing at the regional level and the DEMIFER scenarios

**Figure 3 Population change according to the DEMIFER scenarios in the**



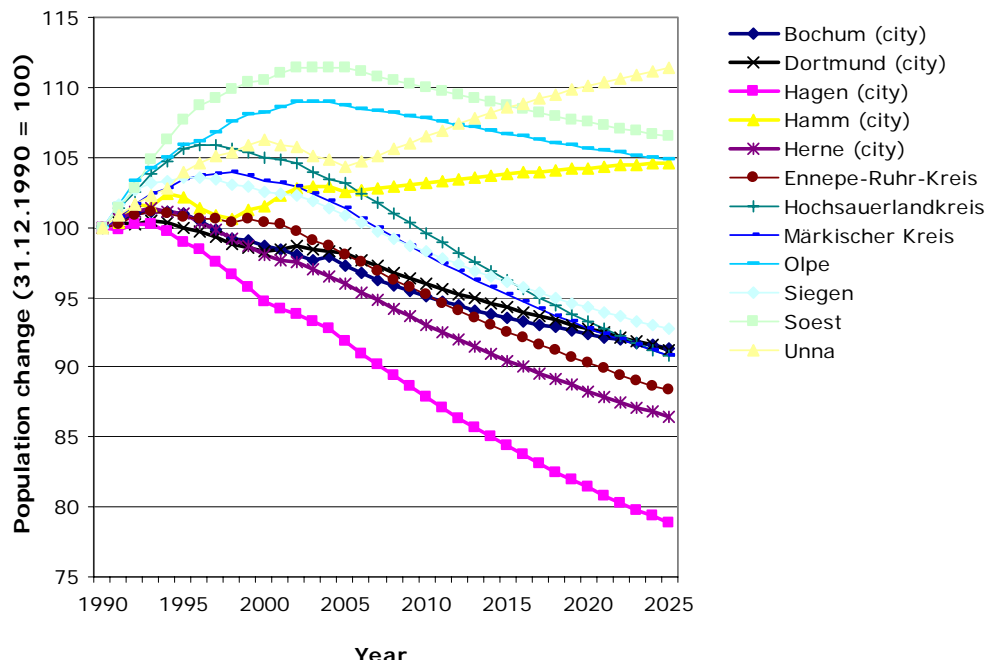
Source: DEMIFER Scenarios, 2010.

**Figure 4 Population ageing according to the DEMIFER scenarios in the**



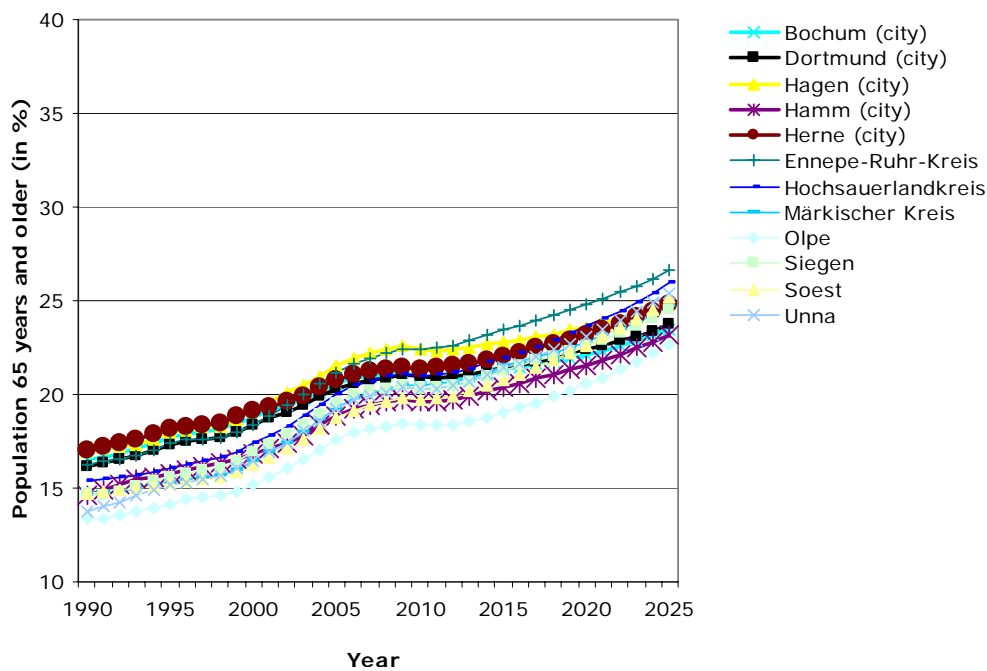
Source: elaborations on DEMIFER Scenarios, 2010.

**Figure 5 Population change according to the BBSR status-quo projection in the Southern Ruhr area (DEA5 Arnsberg), 2005-2025**



Source: BBSR, INKAR CD-Rom, 2009, and BBSR- Bevölkerungsprognose 2005-2025 data base, 2010.

**Figure 6 Population ageing according to the BBSR status-quo projection in the Southern Ruhr area (DEA5 Arnsberg), 2005-2025**



Source: BBSR, INKAR CD-Rom, 2009, and BBSR- Bevölkerungsprognose 2005-2025 data base, 2010.

Compared to the DEMIFER Status Quo scenario all the DEMIFER policy scenarios the population of Arnsberg expect a slowing of population decline in 15 to 20

years. By 2050 a steeper population loss is expected in the case of the Challenged Market Europe (-26.4 %) and the Limited Social Europe (-21.4 %). The Expanding Market Europe scenario (-8.1 %) and the Growing Social Europe scenario (-10.8 %) stabilize the population and limit population decline through higher migration in-flows. In all the policy DEMIFER scenarios a continuous ageing of the population of Arnsberg is expected at a value of around 35 % for the share of the population 65 years and older in the total population.

The BBSR population projection results up to 2025 regarding total population are positioned close to the results of the DEMIFER Growing Social Europe with divergent trends in the sub-areas: the counties of Unna and Hamm might have to expect a population increase, whereas all the other counties will see a declining population. This decline will vary considerably with a steeper path in Hagen and the county of Hochsauerland. Regarding population ageing no important regional differences are expected and all counties will follow a similar path.

## **8. Conclusions and the policy implications of demographic challenges in the case study region**

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## 10. Annex: Data reported in tables, graphs and maps

**Table 12 NUTS 3 regions of the Southern Ruhr area (DEA5 Arnsberg)**

<b>Id NUTS3</b>	<b>Id County</b>	<b>Name</b>	<b>Regional planning region</b>
DEA51	5911000	KS Bochum	Bochum/Hagen
DEA52	5913000	KS Dortmund	Dortmund
DEA53	5914000	KS Hagen	Bochum/Hagen
DEA54	5915000	KS Hamm	Dortmund
DEA55	5916000	KS Herne	Bochum/Hagen
DEA56	5954000	Ennepe-Ruhr-Kreis	Bochum/Hagen
DEA57	5958000	Hochsauerlandkreis	Arnsberg
DEA58	5962000	Märkischer Kreis	Bochum/Hagen
DEA59	5966000	Olpe	Siegen
DEA5A	5970000	Siegen	Siegen
DEA5B	5974000	Soest	Arnsberg
DEA5C	5978000	Unna	Dortmund

Please see separate MS Excel file.