

Characteristics of recovery and resilience in the Romanian regions

József BENEDEK*, Alexander C. LEMBCKE**

Abstract

Differences in regional economic growth trajectories and the multiple regional effects of the economic crisis have revived studies dedicated to the subject of resilience. The main goal of this paper is to measure the resilience of the Romanian regions, seeking to answer two basic questions: What was the regional impact of the global crisis from 2008 onwards? How have the Romanian regions recovered following the crisis? We focus our analysis on the region with the highest economic growth in the post-crisis period (South-East) in order to understand the main drivers of economic recovery. The methodology of the study involves a multi-dimensional understanding of resilience. This means that we have extended our focus from economic indicators towards a more inclusive methodology related to the measurement of regional well-being. Our main finding is that productivity growth was a critical driver of economic recovery, having a significant impact on income and jobs, as well as influencing non-material elements of well-being.

Keywords: regional economic development, recovery, crisis, resilience, Romania

Introduction

In this study, we adopt the perspective of evolutionary economic geography, which looks at four interrelated dimensions of regional economic resilience: resistance, recovery, re-orientation and renewal. We will focus on the recovery dimension of resilience, as only a relatively short period of time has passed since the effects of the global crisis first became apparent in Romania from 2009 to 2010, which is an insufficient period for us to conclude on dimensions such as re-orientation or renewal. In addition, we intend to look beyond the traditionally restrictive concept of economic resilience by focusing on the role of different

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industries during the adaptive process following a major economic shock (see Courvisanos *et al.*, 2016).

Based on recent advances in this field, (Doltu and Duhaneanu, 2011; Benedek and Moldovan, 2015; OECD, 2015), we will strongly emphasise two ideas. First, labour productivity has a crucial role in generating economic recovery and growth. For instance, the OECD study on the “Future of Productivity” reveals that productivity continues to grow faster among the global frontier firms (globally most productive firms), with a low level of diffusion from the top firms to the rest of the economy (OECD, 2015). The same tendency can be observed at the regional level, with a growing productivity gap across regions (OECD, 2016). Second, the tradable sectors (manufacturing, natural resource extraction, internationally traded services etc.) are crucial contributors to productivity growth and their exposure to international competition might enable them to achieve “unconditional convergence” (convergence to the global frontier independent of local framework conditions, such as local institutions). There is suggestive empirical evidence for unconditional convergence in the labour productivity of tradable (manufacturing) sectors across the world (Rodrik, 2013). A range of special characteristics of tradable sectors are related to productivity: a high degree of innovative activities, higher wages, lower dependency on local markets, and significant spillovers (OECD, 2016; Rodrik, 2016). Therefore, the contribution of tradable sectors to the regional economy will be one of the main areas of focus of the current research.

1. Methodology and data

We propose to analyse the recent economic evolution of the Romanian development regions focusing on the South-East development region¹. The proxy to capture economic resilience in the region in this study is GDP per capita compared to the EU average. The South-East region registered the strongest improvement, in terms of economic growth, following the crisis. We will test our main assumptions formulated in the introduction: namely that labour productivity and tradable sectors are crucial drivers of economic recovery. Statistical data used in the study cover the period 2001-15, where possible. The data are combined from four main sources: Eurostat, the OECD, the World Input-Output Database and the Tempo-online Database of the Romanian National Institute of Statistics. As for main proxies for the evaluation of the effect of crisis, we use the gross domestic product (GDP) per capita at constant prices and constant purchasing power parities (PPPs), the unemployment rate and the employment rate. Labour productivity is considered as

¹ Romania is divided into eight development regions that do not correspond to an administrative layer. The two administrative tiers are counties (județe) and the central government. Development regions are, however, relevant for regional development policy and the associated funding from the European Union.

the central element in economic recovery. It is typically measured either as output per worker or as output per hour worked: in this study we rely on labour productivity data measured as GDP divided by total employment.

The paper is organised as follows: in the first section we present the recent economic developments and the trends in regional disparities before and since the 2007-08 global financial crisis; in the second section we focus on the analysis of the socio-economic and demographic characteristics of the South-East region compared to Romania as a whole, evaluating the enabling and constraining factors of economic development in the South-East (including labour productivity, employment, sectoral composition and growth in gross value added [GVA], international trade and competitiveness [unit labour costs], innovation and research and development [R&D]); in the third section we evaluate the relationship between productivity and regional well-being; the final section concludes.

2. Recent economic development and regional disparities in Romania

The existence of regional disparities is not a new phenomenon, nor a specific characteristic of capitalism. Economy and population have always been unevenly distributed over space, tending to concentrate in certain places (Benedek and Török, 2014). These facts are related to two aspects of disparities: their intensity and the changing position of certain regions in the centre-periphery system of economic relations. After a long period of intense economic growth (2000-08 with an annual average per capita GDP growth rate of around 6%), the global financial crisis in 2007-08 contributed to a severe crisis in Romania that started two years later. In 2009 and 2010, aggregate GDP decreased by almost 8%. However, the crisis has not influenced the dominant trend of increasing regional inequalities. Large regional disparities continue to exist among development regions (NUTS 2) and their constituent counties (NUTS 3). While levels of GDP per capita between Romania and the European Union (EU) average have converged, with Romania reaching 57% of the EU average in 2015 (Eurostat, 2017a), the gap has widened within the country. In 2015, the regional GDP per capita of the most advanced region, the capital city region of Bucharest-Ilfov, was 36% above the EU average, while the less developed regions continue to lag significantly behind the EU average: North-East 34% of the EU average, South-West Oltenia 40%, South-Muntenia 47%, North-West 50%, South-East 51% (Eurostat, 2017a).

The general recovery from the crisis was quick, partly as a result of macroeconomic stabilisation interventions. Romania asked for external assistance in 2011 and negotiated a precautionary economic adjustment programme with the European Commission (EC) and the International Monetary Fund (IMF), which was successfully completed in June 2013. It was followed in September 2013, by a 24-month “Stand-by Arrangement” with the IMF for an amount of approximately EUR 2 billion and balance of payment assistance from the EU, also for a sum of

EUR 2 billion (Romanian Government, 2014). The external assistance has largely contributed to safeguard sound public finances and ensure the continuation of monetary and financial sector policies that preserve buffers and increase resilience against external shocks, while reducing bottlenecks to growth through structural reforms (Romanian Government, 2014).

Following the recession in 2009-10, the economy recovered and growth accelerated reaching an annual growth rate of over 3% in 2013, 2014 and 2015, propelled by strong domestic demand and growing exports. The economy underwent important restructuring, marked by a continuous shift in employment from non-tradable activities to tradable activities.

One of the major features of economic growth in Romania is its strong spatial differentiation with concentration of growth in the capital city region Bucharest-Ilfov (Benedek, 2015). As a consequence, interregional disparities are growing. For 2015, the most developed region economically (Bucharest-Ilfov) produced four times the GDP per capita compared to the least developed region (North-East). This makes Romania the sixth most unequal country in the EU, following the United Kingdom, France, the Slovak Republic, Belgium and Germany. Compared to 2004, the difference constitutes a huge increase in the development gap between the capital city region and the North-East region (Eurostat, 2017b), taking the country from a moderate level of regional disparities to a high level (see Table 1).

Table 1. The evolution of GDP per capita as a percentage of the EU average

Region	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
North-West	32	33	37	41	44	45	46	45	47	47	49	50
Centre	34	34	38	42	47	48	49	49	52	51	51	52
North-East	23	23	25	27	30	31	31	31	34	34	34	34
South-East	31	30	33	34	39	40	42	42	47	49	50	51
South-Muntenia	29	29	32	34	40	42	42	43	41	43	47	47
Bucharest-Ilfov	72	82	89	100	126	118	125	135	126	128	129	136
South-West Oltenia	28	27	30	32	37	38	39	40	41	40	39	40
West	38	39	44	48	55	55	58	58	58	57	56	57
Romania	34	35	39	43	49	50	52	52	54	55	55	57

Source: Eurostat (2017b).

In the aftermath of the economic crisis, Romanian regions followed different growth trends. The most notable evolution was the economic dynamic and the “catching up” of the South-East region, which was in the bottom half of the eight development regions before the crisis. As a result of the rapid post-crisis growth, the South-East region has overtaken the North-West region, and is now positioned fourth after Bucharest-Ilfov, West and Centre. If this trend continues, the region will turn from a “low income region” into a dynamic “catching-up region”, with good mid-term prospects for leaving the EU category of “less developed regions” (GDP per capita below 75% of the EU average) to become a “transition region”. Therefore, we will focus on the development of the South-East region and on the factors which have contributed to its strong recovery following the economic crisis.

3. Demography, economic recovery and resilience in the South-East region

The South-East development region is located in the south-eastern part of Romania. It spans from the coast of the Black Sea to the Eastern Carpathian Mountains, crossing the lower course of the Danube River and includes the Danube Delta. It covers an area of about 35 000 square kilometres – the second largest Romanian development region by area – and has a population of around 2.5 million people. The region was created in 1998, following the adoption of Law 151/1998 for regional development in Romania. It comprises six counties (NUTS 3 regions) of which three, Constanța, Galați and Brăila, are classified by the EU as “intermediate” regions (20-50% of the population living in rural areas) and the other three, Tulcea, Vrancea and Buzău, are classified as rural regions (more than 50% of the population living in rural areas).

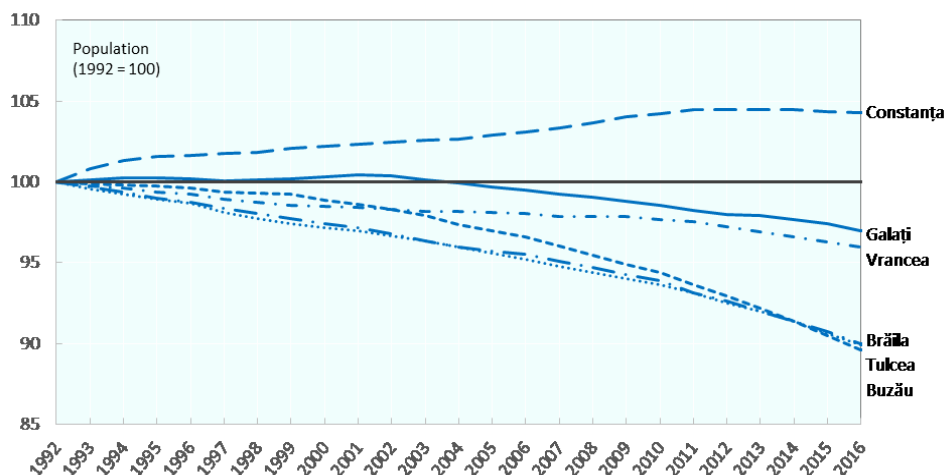
3.1. Demographic trends

Despite the positive developments since the 2007-08 global crisis, the South-East region faces significant challenges for future growth based on its current demographic trends. During the past two decades, the region experienced an overall population decline of 14%. Nearly all counties in the South-East region are affected, only Constanța experienced an increase in population since 1992.² All other counties faced a decline in population with Tulcea, Brăila and Buzău facing the heaviest losses. Today, there are 10% fewer residents registered in these three counties than in 1992 (Figure 1). Within the six counties of the South-East region, population did not decline everywhere and all counties experienced suburbanisation trends with rural – less densely populated – areas in the vicinity of the counties’ urban centres

² The data refer to register-based population estimates. Census-based estimates show a decline in population in all six counties, pointing towards significant population outflows that are considered temporary in the register-based data.

showing significant population growth between 2000 and 2015.³ This sprawling development creates challenges for service delivery and sustainable growth (OECD, 2012a). It also raises concerns in light of findings in the economic geography and spatial economics literature, which emphasize the positive economic role of agglomeration of population and economic activity. Benefits arise through agglomeration as it creates opportunities for economies of scale, transport cost advantages and positive learning effects (Krugman, 1997). Population decline and outflow from urban centres are therefore likely to raise costs and limit productivity and growth in the future.

Figure 1. Population changes in the counties of the South-East region, 1992-2016



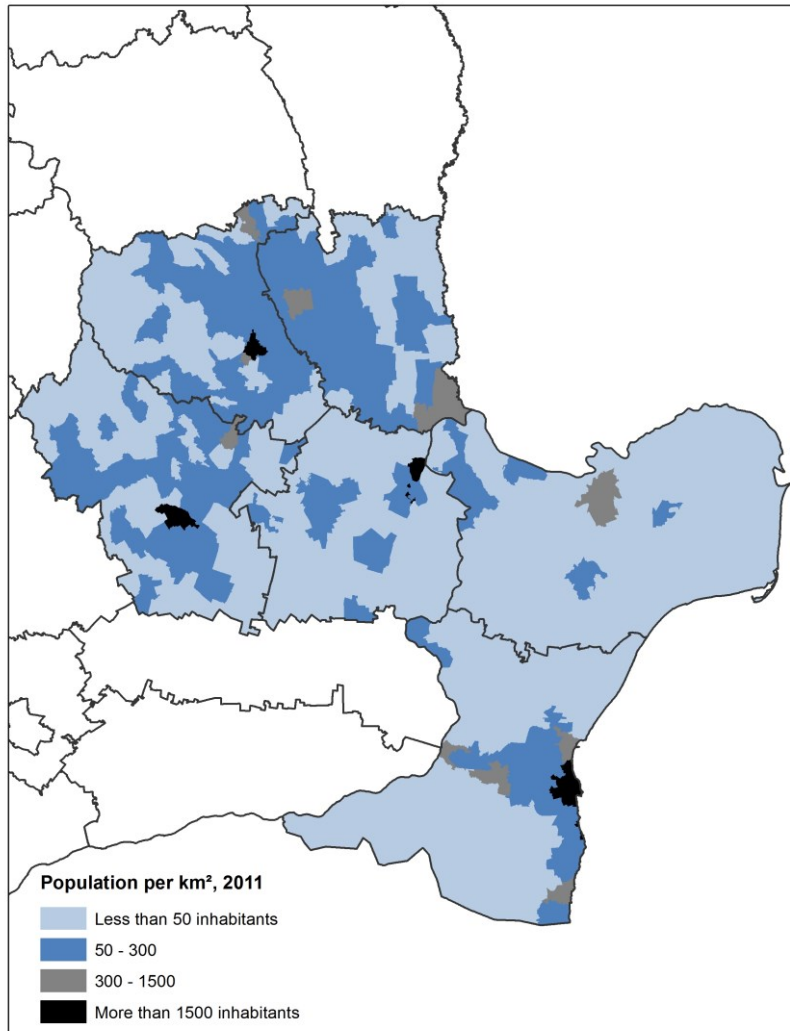
Source: Calculations based on data provided by the National Institute of Statistics (2017).

The largest cities in the South-East region are located alongside large bodies of water: the Danube River, its delta and the Black Sea coast. The region has a lower population density than the national average (70 inhabitants per square kilometre, as compared to 90 at the national level). In particular, the Danube Delta constitutes a major constraint in the north-eastern county of Tulcea which has the lowest population density in Romania (27 inhabitants per square kilometre). Most people in the South-East region live in Constanța County, close to the southern Black Sea coast and in Galați near the lower Danube, where the population density is well above the regional average (Figure 2). The largest population agglomerations are situated around the main urban centres of the region, while large parts of the historical

³ Based on the Global Human Settlement Layer.

Dobrudja (in the counties of Tulcea and Constanța) and of the Bărăgan Plain (county of Brăila) are low density areas.

Figure 2. Population density in the South-East region, 2011

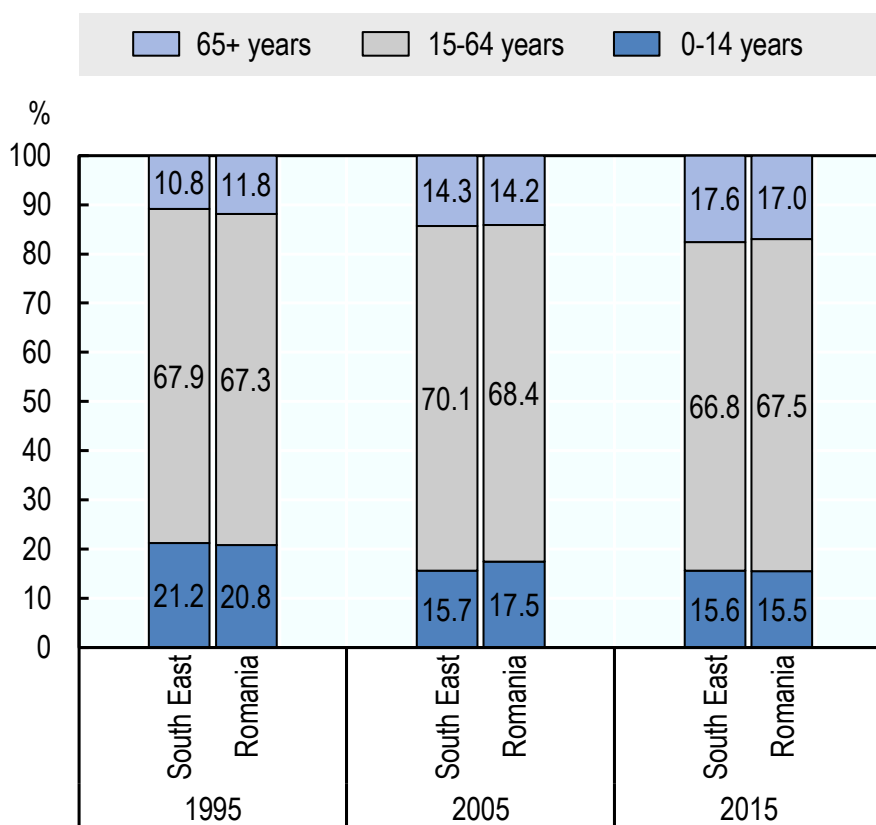


Source: Calculations based on data provided by the National Institute of Statistics (2017).

Population decline is accompanied by demographic shifts. The population of the South-East region is ageing, the share of elderly population in the total population (65 years old and older) increased by nearly 7 percentage points between 1995 and

2015, from less than 11% to more than 17% (Figure 3). The ageing trend in the South-East region follows the national trend. However, the share of elderly population has increased more rapidly in the South-East region than in the rest of Romania. While the share was below the national average in 1995, it increased to slightly above the national average in 2005, and by 2015 the gap had further widened. This rapid pace signals unfavourable prospects for the mid-term demographic and economic growth of the region.

Figure 3. The South-East region's population is ageing



Source: Calculations based on OECD (2017a).

While the prospects are challenging, the demographic trends and sprawling population development make advances in productivity even more critical for the sustainable mid-term development and well-being of the region. As elderly dependency ratios increase and the working age population declines (see Annex 1) productivity increases are necessary to sustain and improve living standards.

3.2. Economic development and recovery in the South-East region

National and European comparison of economic performance in the South-East region

The South-East region accounts for 12.5% of Romania's population, 11.3% of total output and 11.6% of total employment (Annex 1). Some facts stand out when comparing the South-East region to the Romanian aggregate. First, the GDP per capita in the South-East region remains below the national average, but its growth rate since the 2007-08 crisis exceeded the national average growth rate by a factor of seven. As a consequence, the South-East region currently has the fourth highest GDP per capita among the eight Romanian development regions.

Second, despite this rapid economic growth, the labour market shows a less favourable picture. The unemployment rate, including the young and long-term unemployed, exceeds the national average. The overall labour force participation rate and female labour force participation rate are lower than at the country level. Third, education and innovation indicators are below the national average and highlight the need to improve and invest in human capital in the South-East region.

Neither improvement in employment in the region, nor growth driven by innovation and R&D seem to have been fundamental pillars of economic recovery in the South-East region, although the region experienced improvements in both areas. Comparing the South-East in the wider European context with similar "low income" regions, i.e. regions in EU countries with less than 50% of the EU average GDP per capita in 2013 (see Annex 1), shows significant gaps in education indicators, with other low income regions having significantly higher shares of tertiary educated workers and lower shares of workers who did not pursue any secondary education. A similar opportunity for catching up remains for innovation-related indicators, patents and R&D spending in the South-East region, which are still lagging behind other low income regions. Overall unemployment is at similar levels, but youth unemployment, at nearly 30%, is several percentage points higher than in other low income regions and labour force participation, both overall and for women, is several percentage points behind other low income regions. Nonetheless, GDP per capita is around 10% higher in the South-East region than in other low income regions.

Trends in GDP per capita, labour productivity and employment

One of the most striking economic characteristics of the South-East region is its rapid labour productivity growth. The region was the fastest growing among the eight Romanian development regions. Between 2000 and 2014, labour productivity, measured as GDP per worker, grew by nearly 116%, i.e. it more than doubled in just

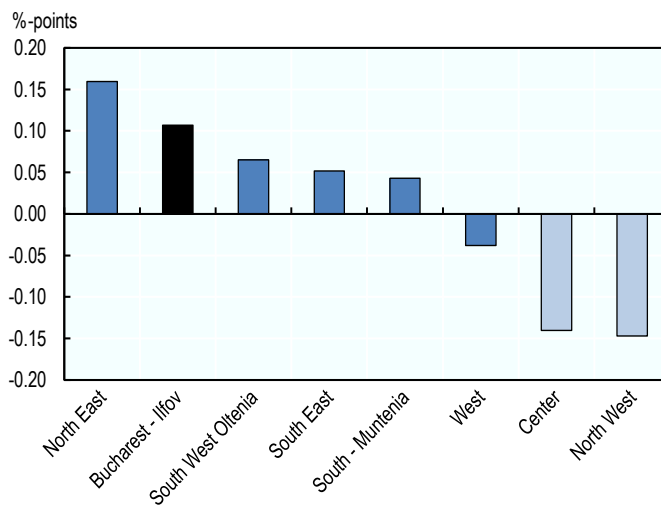
15 years.⁴ This growth is impressive when compared to the average rate of labour productivity growth in the OECD economies, which was around 1% per year before the global 2007-08 crisis (OECD, 2016).

Rapid growth led to the “catching up” of the South-East region to Romania’s most productive region, Bucharest-Ilfov. The South-East region contributes positively to overall productivity growth in Romania, but despite being the fastest growing region, it is not a major contributor to national productivity growth. The South-East region ranks fourth among the eight Romanian regions for labour productivity growth between 2000 and 2014 (Figure 4, Panel A).

Around two thirds of national GDP growth in Romania is fairly evenly spread across seven regions, with the South-East region contributing about 10.5% of GDP growth between 2000 and 2014, the third highest contribution among the non-capital regions, following North-West (11.2%) and South-Muntenia (11.6%). The remaining one-third of GDP growth was generated by the national frontier region, Bucharest-Ilfov, by far the single largest contributor (Figure 4, Panel B).

Figure 4. Contribution of the development regions to national labour productivity and GDP growth

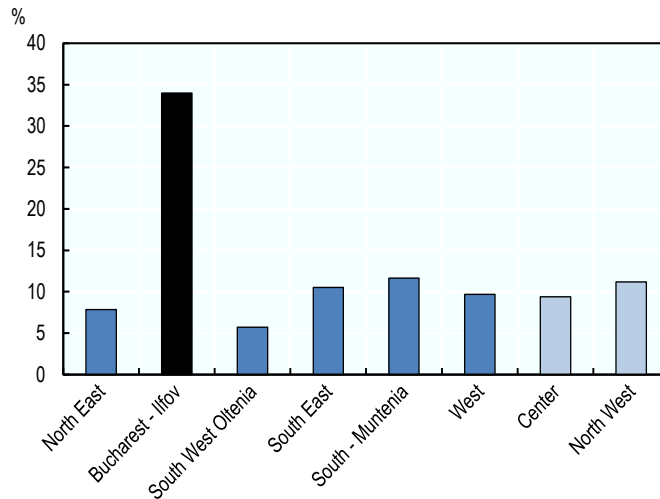
Panel A: Percentage contribution to national labour productivity growth, 2000-14



Note: Difference between national labour productivity growth as calculated with and without the indicated region.

⁴This translates to an annual average growth rate of 5.7% using compound growth or 8.3% using the arithmetic average (see also Figure 11 for productivity growth in terms of gross value added per worker).

Panel B: Percentage contribution to national GDP growth, 2000-14

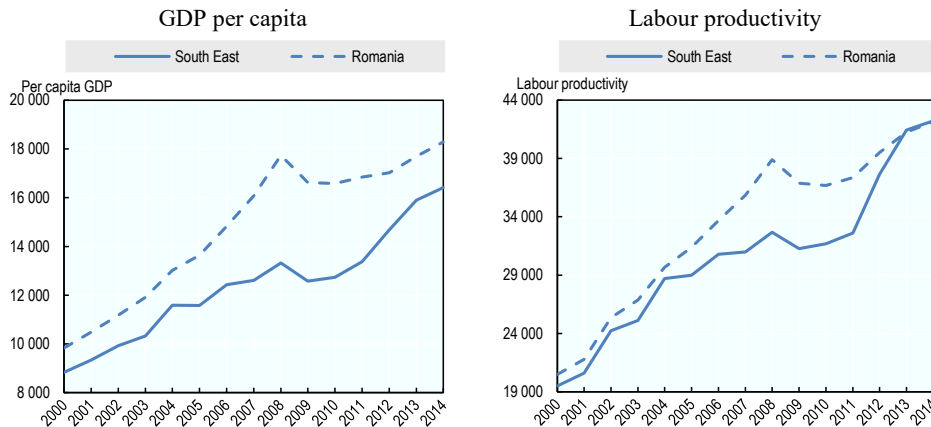


Note: The contribution is the product of a region's GDP growth rate by its initial share of GDP.

Source: Calculations based on OECD Regional Statistics [Database] and OECD (2016).

The global 2007-08 crisis briefly halted growth in the South-East region, but the economy recovered quickly to return to the previous growth trajectory. The South-East region experienced rapid economic growth between 2000 and 2007. GDP per capita grew by 63% and labour productivity by 74%. Despite its fast growth, the region did not keep pace with national pre-crisis expansion. Between 2000 and 2007, national GDP per capita grew by 80% and labour productivity by 105%. Important for our interpretation of economic recovery in the South-East region is the fact that this region caught up with the average labour productivity level in Romania in 2013, following a growth spurt after the crisis (Figure 5). This catching up in terms of labour productivity can be considered the main driver of post-crisis economic growth and recovery. The key role of labour productivity growth in economic growth is in line with the main empirical findings for other similar regions in the most recent *OECD Regional Outlook* (OECD, 2016).

The crisis halted growth only briefly. Between 2009 and 2010, both GDP per capita and labour productivity dropped, but the regional economy was growing again by 2010, albeit slowly at first. By 2011, the South-East region had returned to pre-crisis levels of GDP per capita and labour productivity. From 2011 onwards, the South-East region outgrew the country as a whole, narrowing the gap in terms of GDP per capita and closing the gap to the country average labour productivity

Figure 5. Trends in GDP per capita and labour productivity, 2000-2014

Note: Regional GDP is measured in USD at constant prices and constant PPP with base year 2010. Labour productivity is regional GDP divided by total employment.

Source: Calculations based on OECD (2017b).

The explanation for rapid productivity growth we put forward is that the crisis stopped unsustainable trends in over-investment in less competitive economic sectors and reoriented capital and technology investment towards more productive activities and companies. The remaining gap in per capita GDP is in part due to the lower participation rate of the South-East region (64% in 2015, while Romania had a 66% participation rate), especially in terms of female participation: the female labour participation rate is 6 points lower (51%) in the South-East region, compared to the national average of 57% (Annex 1). In part, the gap is also due to the sectoral composition across regions, especially highly productive tradable services (such as in information and communication technologies [ICT] or financial and insurance services) which tend to be concentrated and disproportionately located in the Bucharest-Ilfov region. The capital city region accounted for 18% of GVA in ICT and 37% in financial and insurance activities in 2014, but for just 11.5% of Romania's population. In contrast, in the South-East region, ICT and financial and insurance activities accounted for 13% and 12% respectively, in line with the 12.5% of Romania's population living in the region.⁵

While regional GDP per capita and labour productivity improved, employment did not follow the same trend. The unemployment rate in the South-East region rose from around 7% in the late-1990s to more than 10% during the years of the early 2000s (Figure 6). The 2009-10 recession reversed a gradual decline in unemployment and led to significant job losses, largely concentrated in sectors with

⁵Calculations based on OECD Regional Statistics Database.

high shares of unskilled workers, such as industry and construction. Unemployment in the South-East region has traditionally been higher than the country average, for which the unemployment rate fluctuated between 7% and 8% over most of the period. Persistent unemployment was accompanied by a declining employment rate in the South-East region. The rate declined steadily from its peak of about 61% in the early 2000s to less than 55% in 2014. The recent spike in 2015 brought the employment rate back to nearly 58%, but the overall decline has still doubled the gap in the national employment rate from about 2 percentage points in 2000 to about 4 percentage points in 2015. Slow job recovery since the recession has been attributed to a mismatch between the skills required by hiring companies and those offered by job seekers (Iordache *et al.*, 2016a).

Figure 6. Unemployment and employment rates in the South-East region and Romania, 1996-2015



Note: Unemployment rate is defined as the ratio of the number of unemployed 15-64-year olds divided by the 15-64-year old labour force (total employed + unemployed persons). The employment rate is the ratio of total employment among the 15-64-year olds and the total working age population (15-64 year olds).

Source: Calculations based on OECD (2017c, 2017d).

Labour market reforms were introduced in 2011 as a reaction to the 2009-10 crisis. The new Labour Market Code and Social Dialogue Code aim to promote flexibility in the labour market.⁶ They changed contract regulations, employment protection legislation, the system of industrial relations and strengthened incentives for the unemployed to search for jobs. Concrete measures included the reduction in

⁶The new legislation was not universally positively received: see e.g. Chivu *et al.* (2013) for a critical comment.

hiring costs, increasing flexibility of the quantity of labour time, elimination of nationally centralised collective bargaining agreements in favour of sectoral and (groups of) company bargaining, stricter rules for the formation of trade unions, reduction in the generosity of unemployment benefits and the period they can be received, and cuts for jobseekers who refuse a job offer that is adequate given their training or education (Iordache *et al.*, 2016a, Iordache *et al.*, 2016b). At the same time, the gross minimum wage has been increased three times between 2015 and 2017 (1050 Romanian Leu [RON] in July 2015, RON 1250 in May 2016, and RON 1450 from February 2017).

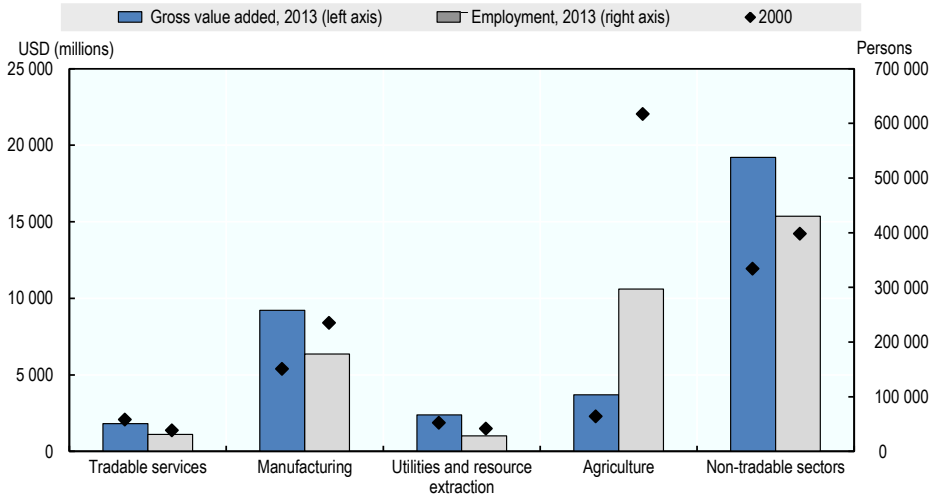
While wage increases are necessary for improving living standards, productivity growth was lower than the growth rate of wages, fuelling an increase in labour costs (NBR, 2015). This rise has contributed to the developments after the recession that led to full recovery in terms of economic output, but a slower “jobless recovery” in the labour market (Iordache *et al.*, 2016b). The South-East region is not unique in this context, “jobless recovery” also characterises the development in other Eastern European “low-income regions” (European Commission, 2017).

The long-term unemployment rate in Romania increased after the crisis, from 2.4% in 2010 to 3% in 2015, signalling an increase in structural unemployment. In the South-East region, the long-term unemployment rate is higher than the national average (4.4%). The employment challenge for the South-East is amplified by the high rate of youth unemployment (31%), making it one of the three Romanian regions eligible for the Youth Employment Initiative. Iordache *et al.* (2016a) set out the major factors inhibiting the creation of jobs in the development of more technology intensive sectors: the inability of the education system to generate appropriate skills and qualifications for the needs of the new economy; increases in the minimum wage; high taxes on labour (including social security contributions) relative to other countries. The lack of transmission of positive developments in terms of labour productivity to the wider labour market and to substantial employment growth raises the concern that it falls short of creating benefits and improvements in the living standards in the region. This conclusion will be verified in this paper in the section dedicated to the analysis of regional well-being.

The structure of economic output and employment

The main working assumption for explaining the post-crisis economic recovery and growth in the South-East region is related to the role played by tradable sectors in increasing labour productivity, and, therefore, in supporting economic growth and recovery. There is pervasive empirical evidence that workers in tradable sectors, in particular manufacturing sectors, resource extraction and certain “tradable” services are, on average, more productive than in non-tradable activities (OECD, 2016). In particular, the largely knowledge-intensive “tradable services”, which include e.g. ICT activities or financial and insurance firms, record high levels of labour productivity.

Figure 7. Sectoral contribution to GVA and employment in the South-East region, 2000 and 2013



Note: GVA is the total output less the total inputs in the industry and is expressed in USD in constant prices and constant PPP with a base year 2010. Employment is total employment at place of work. Industry classification is ISIC rev4. Tradable services include the information and communication sector (J), as well as financial and insurance activities (K) and the arts and entertainment etc. (R-U). Non-tradable sectors are construction (F), distributive trade etc. (G-I), real estate activities (L), professional scientific and technical activities etc. (M-N), public administration etc. (O-Q).

Source: Calculations based on OECD methodology (2017e, 2017f).

One of the major sources of productivity growth in the South-East region is the massive economic restructuring in employment except in agriculture (Figure 7). The sector recorded significant job losses with total employment declining by 50% between 2000 and 2013 (300 000 fewer jobs). Despite the massive reduction in employment, the trend was accompanied by an increase in GVA of more than 60%, an annual average growth rate of 3.8%. It is also important to note that employment is expressed by the number of workers and not the full-time equivalent, which might overestimate the active workforce, especially in agriculture.

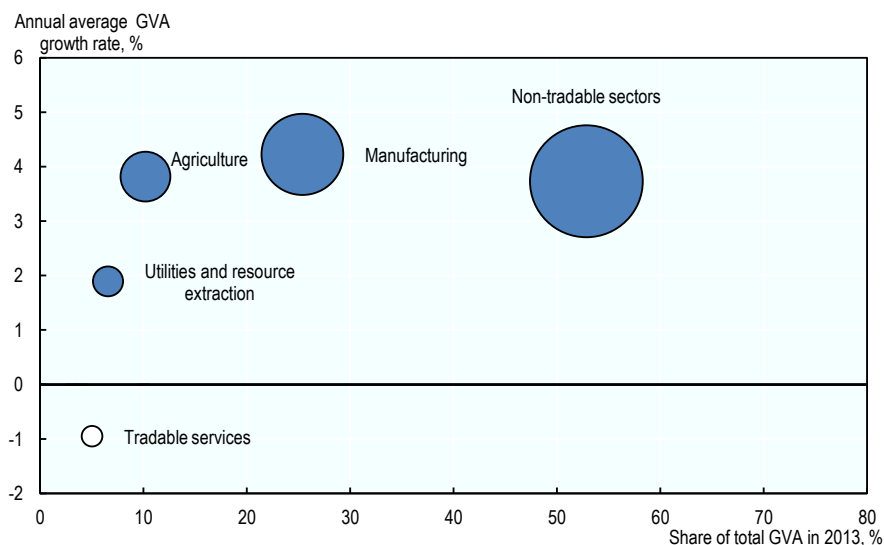
Similar restructuring is evident in manufacturing. The total employment in the manufacturing sector declined by around 50 000 jobs, but the output increased by 70% (4.2% per year). Tradable services and the utilities and resource extraction sectors also employed fewer people in 2013 than in 2000. However, GVA in utilities and resource extraction grew, this being likely related to the discovery and exploitation of new natural gas reserves in the Black Sea region.

The only sector that showed employment gains was the non-tradable services sector. GVA in non-tradable services grew by 61% over the 2000-13 period and

32 000 jobs were created. This increase is related to the expansion of retail, construction and public service activities during this period, all being considered less exposed to international competition, and accordingly as non-tradable activities.

While output in agriculture, manufacturing and non-tradable sectors grew at roughly the same rate between 2000 and 2013, the different sizes of the sectors resulted in non-tradable sectors contributing more than 55% to total GVA growth, while manufacturing and agriculture contributed about 30% and 12% respectively (see Figure 8). Tradable services, a crucial driver of growth for many high-income EU regions, declined in terms of GVA. It was the single economic sector that contributed negatively to the region's economic growth.

Figure 8. Growth and contribution to total GVA growth in the South-East region, 2000-13



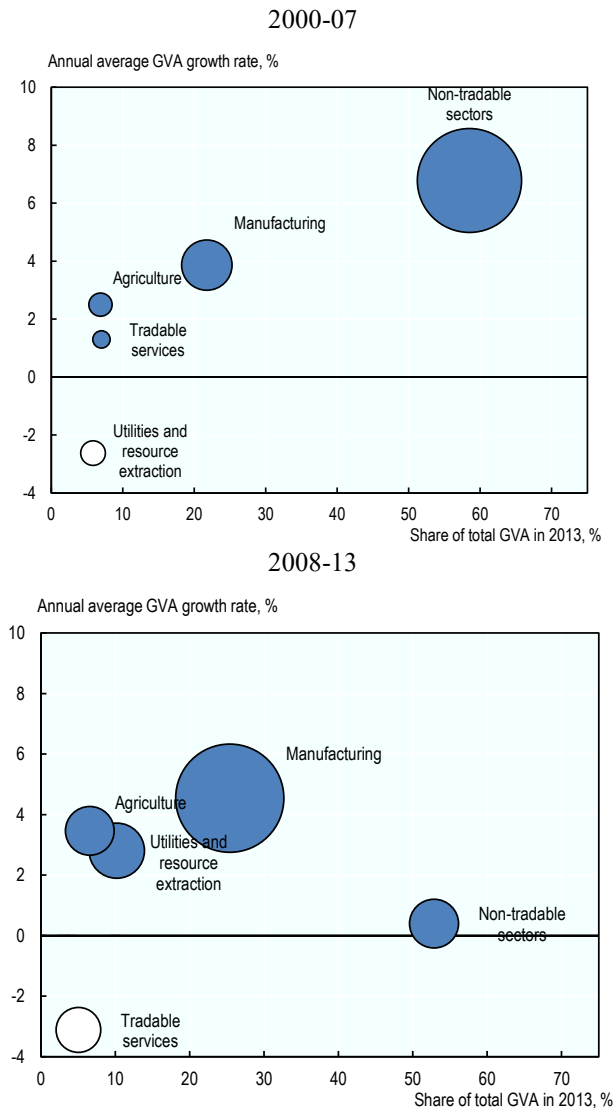
Note: Bubble size indicates contribution to GVA growth: white bubbles indicate a negative contribution. GVA is the total output less the total inputs in the industry and is expressed in USD in constant prices and constant PPP with a base year 2010. Employment is total employment at place of work.

Source: Calculations based on OECD methodology (2017e, 2017f).

The aggregate trends mask different developments that took place before and since the global 2007-08 crisis. While non-tradable activities were expanding rapidly between 2000 and 2007, they have stagnated since the crisis. The main driver of GVA growth in the South-East region since the crisis was manufacturing, followed by agriculture and resource extraction (Figure 9). The importance of tradable sectors as drivers of “catching up” is in line with findings from other studies, e.g. the *OECD*

Regional Outlook identifies a high and increasing share of tradable activities as a key distinguishing feature between regions that are catching up to their country's most productive region and those that are diverging from the "frontier" (OECD, 2016). This empirically reinforces the notion that tradable sectors are crucial for economic recovery.

Figure 9. Growth and contribution to total GVA growth, 2000-07 and 2008-13

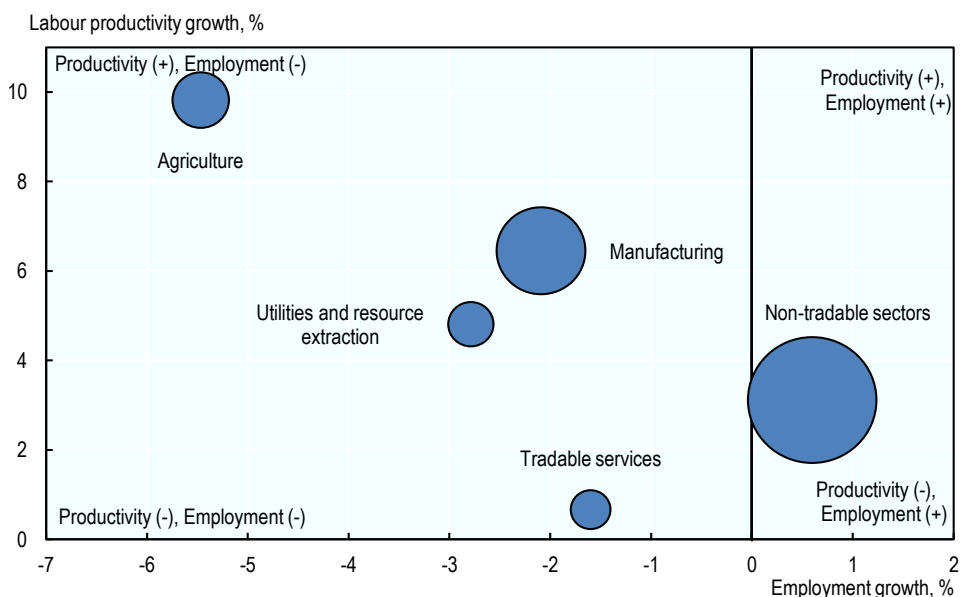


Note: Bubble size indicates contribution to GVA growth: white bubbles indicate a negative contribution. GVA is the total output less the total inputs in the industry and is expressed in USD in constant prices and constant PPP with a base year 2010. Employment is total employment at place of work.

Source: Calculations based on OECD methodology (2017e, 2017f).

Despite a high average annual growth rate of 3%, the non-tradable sector is the slowest growing sector in terms of productivity between 2000 and 2013 (Figure 10). However, the non-tradable sector is also the only sector that combined labour productivity with employment growth over the 2000 to 2013 period. A breakdown of this trend shows that employment gains occurred in the first half of the period. Since the crisis, employment has declined in all sectors. The productivity of other sectors is accompanied by large reductions in employment, especially in agriculture, where the annual average employment growth amounted to -6% over the period 2000-13, which underpins the very high labour productivity growth (around 10%).

Figure 10. Labour productivity and employment growth rates, 2000-13

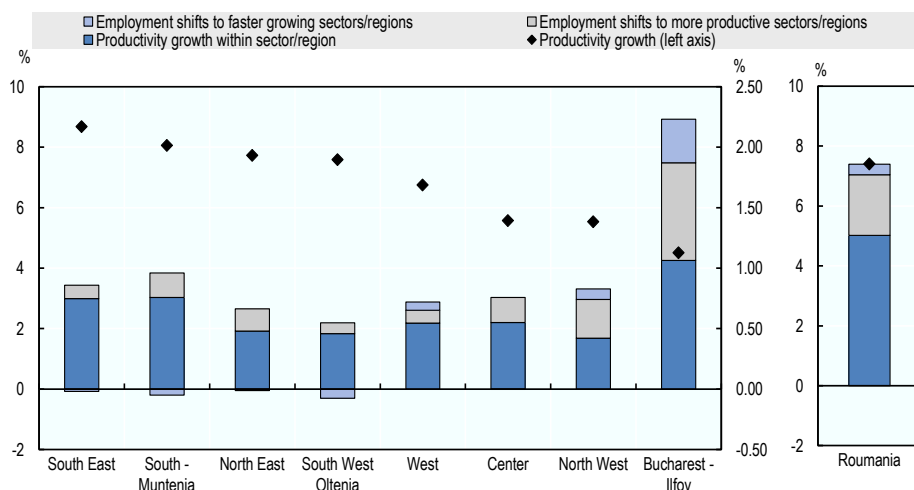


Note: The size of the bubble indicates the share of GVA produced by the sector in 2013. Growth is expressed in annual average growth rates. Labour productivity is GVA divided by total employment. GVA is the total output less the total inputs in the industry and is expressed in USD in constant prices and constant PPP with a base year 2010. Employment is total employment at place of work.

Source: Calculations based on OECD (2017e, 2017f).

Combined, the economic restructuring in all sectors gave the South-East region the highest productivity growth among the eight development regions in Romania over 2000-13 (Figure 11). The main driver of growth was productivity improvements within sectors, as opposed to shifts of employment to more productive sectors or towards faster growing sectors. The pattern is similar for most regions in Romania although the Bucharest-Ilfov region stands out as showing significant shifts to faster growing sectors. While in 2000 the region accounted for 9% of total employment, by 2013, 12.9% of total employment was concentrated in and around the capital. This relative shift of employment into the more productive sectors located in the frontier region of Romania contributed to a significant share of overall productivity growth.

Figure 11. Decomposition of regional productivity growth in Romania, 2000-13



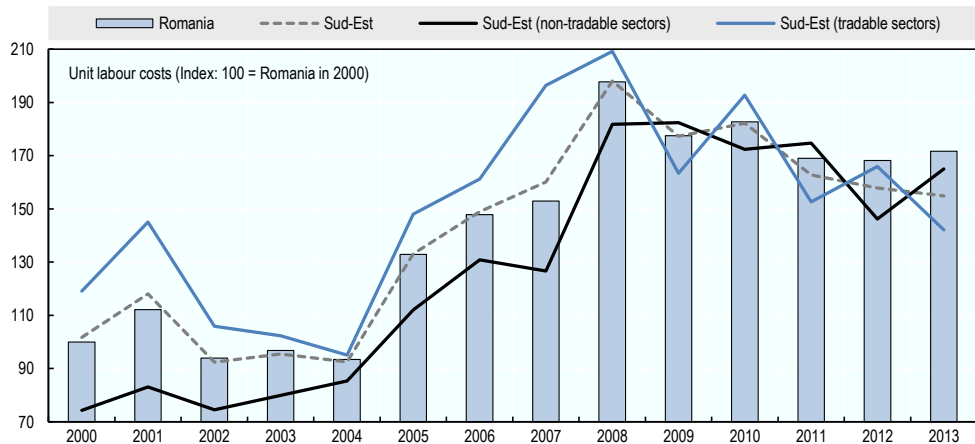
Note: GVA per industry is expressed in constant prices and constant PPP with a base year in 2010. Employment per industry is employment at place of work expressed in number of persons. Productivity is the ratio of GVA and employment.

Source: Calculations based on OECD (2017e, 2017f).

Unit labour costs – a measure of (labour) cost competitiveness – in the South-East region follow the national average closely. Unit labour costs remained relatively stable between 2000 and 2004, followed by a rapid rise until the 2007-08 crisis, after which they declined slightly. The regional average hides the sectoral disparities between tradable and non-tradable sectors. Contrary to what is observed in other low-growth or low-income regions, the South-East region has, on average, higher unit labour costs in tradable sectors than in non-tradable sectors. The gap narrows

after the 2007-08 crisis, leaving only minor differences between the two types of sector. While unit labour costs are an important indicator of cost competitiveness, the key issue they highlight is that productivity growth needs to underpin growth in wages and personnel costs.

Figure 12. Trend in unit labour costs, 2000-13



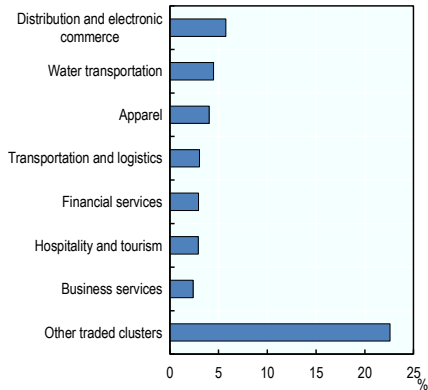
Note: Unit labour costs are the ratio of total personnel costs in current prices and labour productivity measured as real GVA per worker.

Source: Calculations based on Eurostat (2016a, 2016b, 2016c).

A closer look at the sectoral structure, based on data from the EU Cluster Observatory (Ketels and Protsiv, 2016), shows the importance of transport, tourism and low-tech manufacturing for the South-East region. Among the economic activities in the region, the water transportation sector is highly concentrated: around 90% of Romania's employment in the cluster is located in the South-East region (Figure 13, Panel C). This concentration is linked to the presence of some major ports in the South-East region. Distribution and electronic commerce represents one of the largest clusters in terms of employment and wages in the region (Panels A and B). Transportation and logistics, as well as the distribution clusters, are linked to the trade and distribution role of the region. Apparel, metal working (including upstream metal manufacturing) and food processing and production are the largest manufacturing clusters in the South-East region.

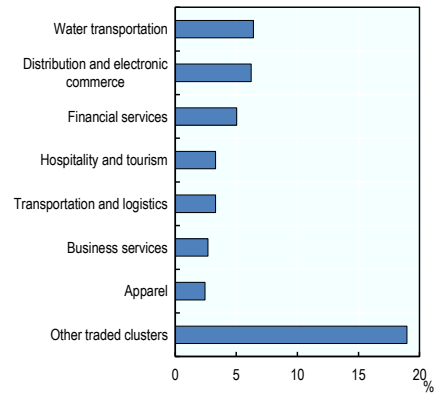
Figure 13. The role of clusters for total employment and wages, 2014

A. Contribution of clusters to total employment in the South-East region, 2014



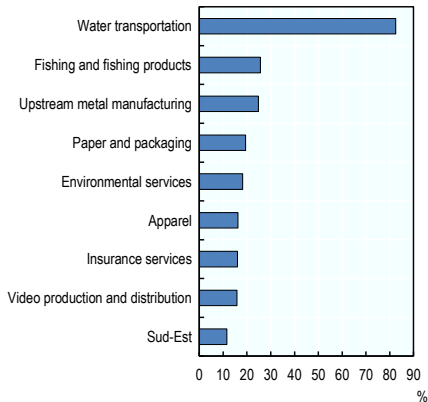
Note: Full-time equivalent employment.

B. Contribution of clusters to total wages paid in the South-East region, 2014



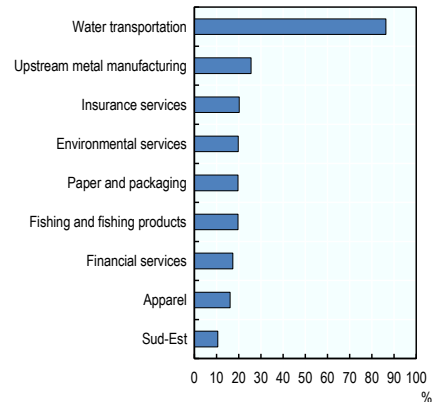
Note: Total wages paid are measured in EUR in 2010 prices and PPP.

C. Contribution of clusters in the South-East region to total employment in the cluster in Romania, 2014



Note: Full-time equivalent employment.

D. Contribution of clusters in the South-East region to total wages paid in the cluster in Romania, 2014



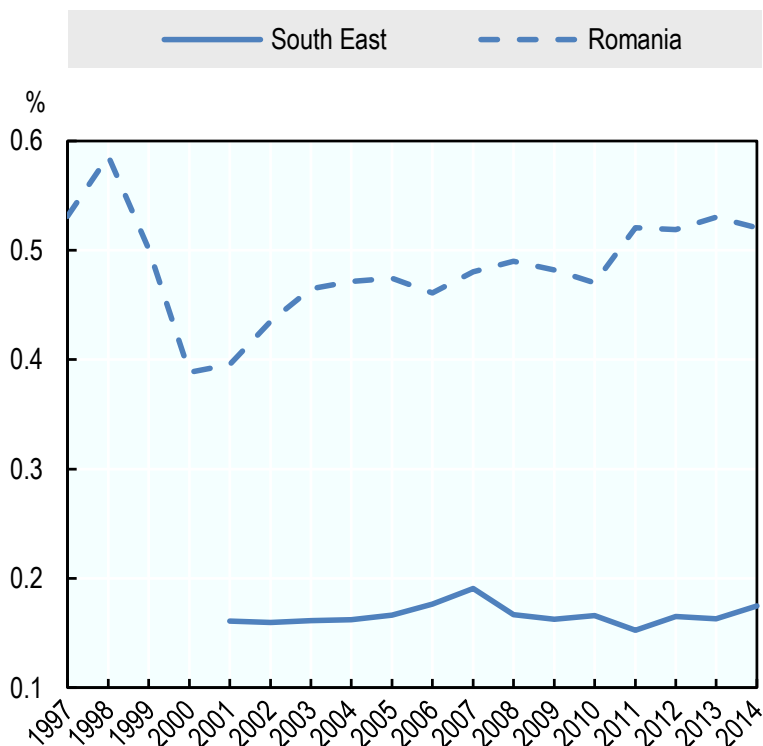
Note: Total wages paid are measured in EUR in 2010 prices and PPPs.

Source: Calculations based on Ketels and Protsiv (2014, 2016), data provided by the authors.

R&D in the South-East region

It is generally accepted that research and development (R&D) activities and innovation are important for regional development. However, as recent studies on regional convergence and catching up have demonstrated, the catching-up process in less developed, low income, regions is often weakly related to innovation or R&D (Rodríguez-Pose and Crescenzi, 2008; OECD, 2012b; OECD, 2016). Employment in R&D accounts for a very small share of total employment in the South-East region (less than 0.2%), denoting a real deficit in this sector in the regional economy, while the share is three times higher in the rest of the country (Figure 14).

Figure 14. Contribution of R&D-related employment to total employment, 1997-2014

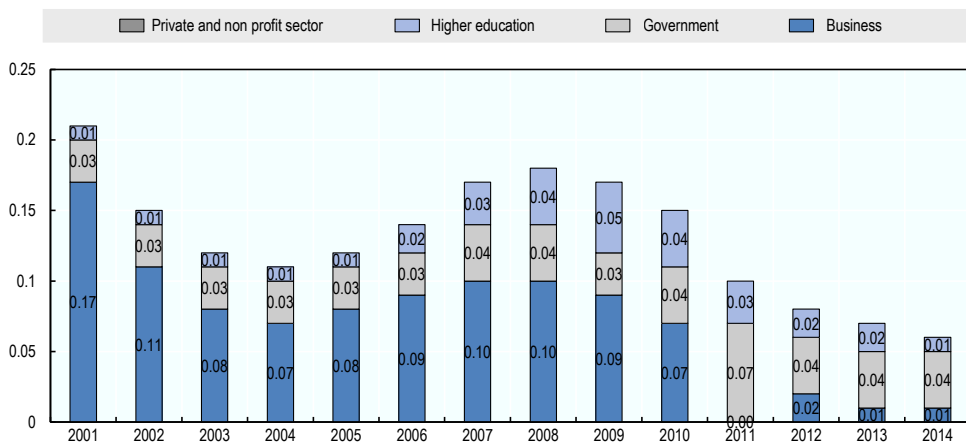


Note: Ratio of research and development-related employment to total employment, both in number of persons.

Source: Calculations based on Eurostat data (2016d, 2016e).

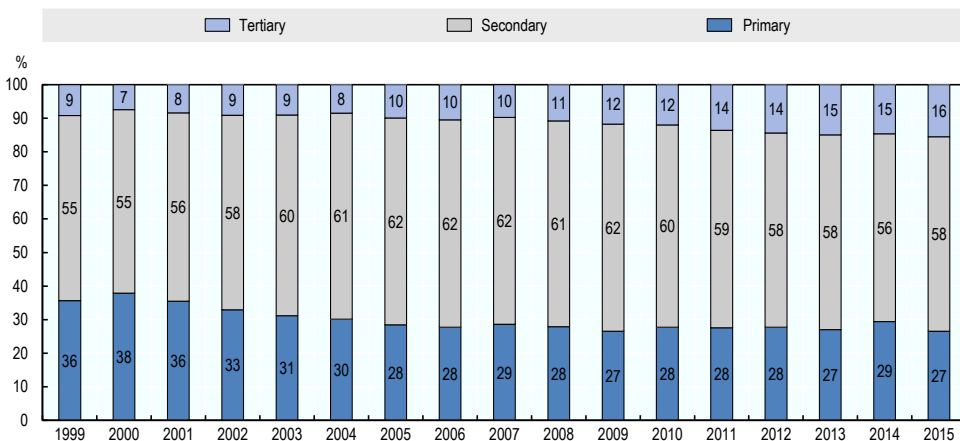
The picture is the same for other indicators of R&D activities. For example, R&D expenditure is only a small percentage of GDP in the South-East region (less than 0.2% of GDP). Moreover, the percentage decreased from 2001 onwards, as investment by the business sector declined. It started picking up after 2004, also through a slight increase of government and higher education R&D expenditure. However, after the crisis, R&D expenditure dropped and expenditure by the business sector all but disappeared (Figure 15).

Figure 15. R&D expenditure as a percentage of GDP in the South-East region, 2001-14



Source: Calculations based on Eurostat data (2016f, 2016g).

R&D activities, but also higher value added activities such as knowledge intensive services or medium-high/ high-tech manufacturing, are related to the share of the labour force with higher skills and tertiary education. The economy in the South-East region shows relatively few workers at the high and low extremes of educational attainment and 58% of the labour force had secondary education in 2015 (Figure 16). This share remained quite stable between 1999 and 2015, with a decrease of workers with only primary education and a steady increase in the share of the labour force with tertiary education. The high percentage of workers with secondary or higher education is in contrast to southern European “low-growth” regions, where workers with only primary education often account for over 50% of the labour force (OECD, 2016).

Figure 16. Labour force by educational attainment in the South-East region, 1999-2014

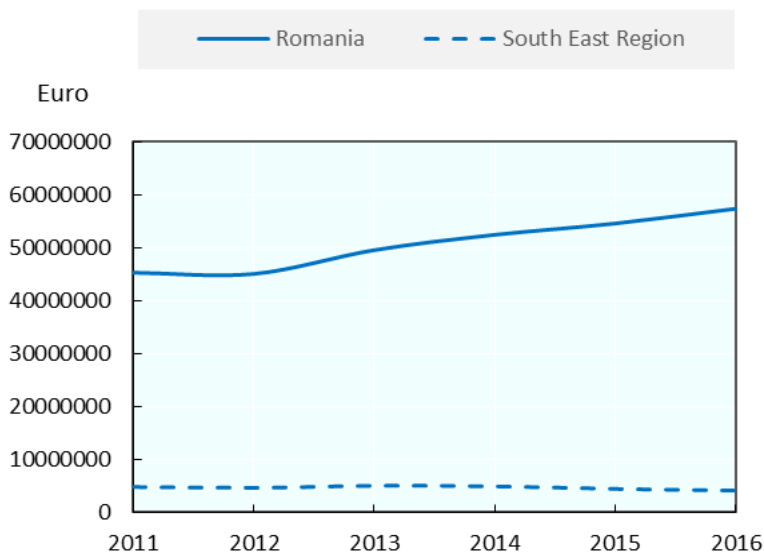
Source: Calculations based on Eurostat data (2016h)

Export activities in the South-East region

Following the 2009-10 recession, exports recovered quickly in Romania. Trade might have also contributed to economic recovery in the South-East region, but in reality the opposite is the case. Exports in the South-East region declined continuously from EUR 4.8 billion in 2011 to EUR 4.1 billion in 2016 (Figure 17). The positive development in the South-East region and the region's economic recovery are therefore unlikely to be export led. This might seem to contradict the assertion that tradable sectors are essential for productivity growth and catching-up, however the argument for tradable sectors is not that firms are necessarily trading externally, but that they are exposed to international competition. This exposure requires firms to ensure sufficient dynamism and innovation to stay competitive or risk being pushed out by international competitors.

Within the South-East region, half of the total exports are concentrated in Constanța, followed by Galați (20%) and Buzău (15%), while the remaining three counties have a share of around 5%-6% each. In the case of Constanța, three products accounted for almost 80% of total exports in 2016: mineral products (32%), vehicles, vessels and associated transport equipment (27%) and vegetable products (21%). The exports of Galați are largely concentrated in two sectors: base metals and articles of base metals (63%) and vehicles, vessels and associated transport equipment (22%). Extremely vulnerable is the small export sector of Vrancea, with textiles accounting for almost 80% of total exports in 2016.

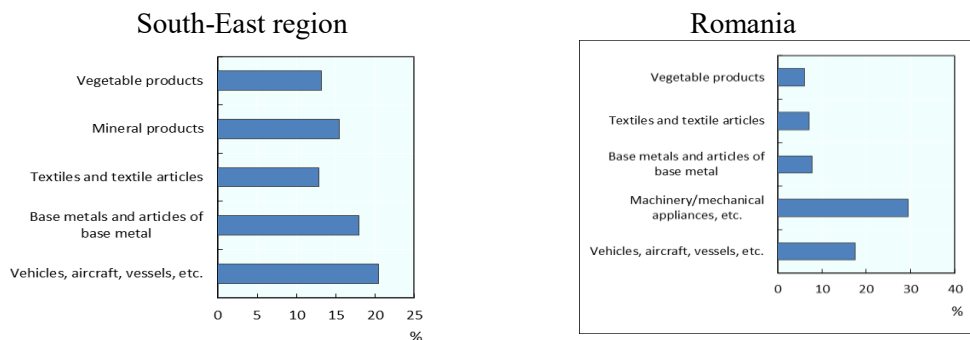
Figure 17. Trend in international exports, 2011-16



Source: Calculations based on National Institute of Statistics, Tempo online database (2017).

From the top five export sectors in Romania, exports in machinery (one of the major and most dynamic industries in Romania) is less relevant in South-East, while three labour and resource intensive sectors have higher export shares in the South-East than in Romania as a whole. These three sectors are vegetable products, textiles and base metals and articles of base metals (Figure 18).

Figure 18. Top five export sectors in the South-East region and Romania



Source: Calculations based on National Institute of Statistics, Tempo online database (2017).

3. Productivity and well-being

Increasing productivity is central, not only for long-term growth, but also for raising living standards (OECD, 2016). While capital investments are associated with positive but decreasing returns, raising labour productivity is almost the only way to improve living standards (Krugman, 1997). One way to examine living standards in regions in Romania is by using the well-being concept and indicators developed by the OECD (OECD, 2014). The data for the measurement of well-being in Romania, which is not an OECD member country, is not available for all dimensions considered in the *OECD's Better Life Initiative* which examines regional well-being across the OECD, however most dimensions and indicators used by the OECD can be calculated for a Romanian well-being index⁷.

Table 2 displays the regional comparison of well-being in Romania. It reproduces the same basic spatial pattern of regional disparities as the economic indicators: Bucharest-Ilfov has the highest overall score (66), followed – at a significant distance – by five regions with almost the same compound scores, while two regions are lagging well behind, the South-West region (12.8) and our case study region, South-East (21.2).

Table 2. Well-being in Romanian development regions, 2015

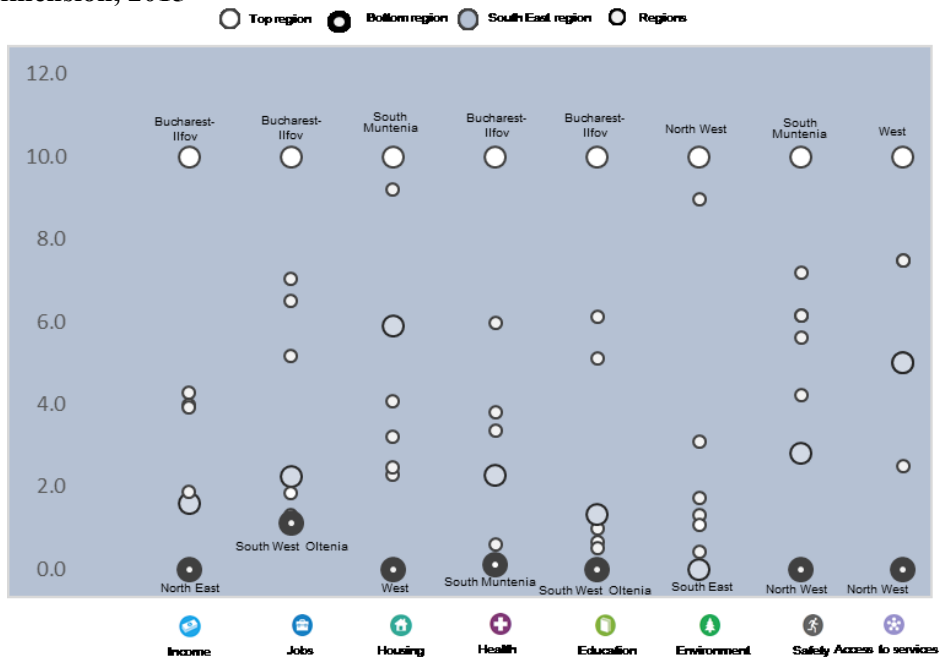
Region	Income	Jobs	Housing	Health	Education	Environment	Safety	Access to services	Total score	Diff. score to 2007
North-West	4.0	6.5	4.1	3.4	5.1	10.0	0.0	0.0	33.0	2.2
Centre	4.3	5.2	2.3	6.0	1.0	1.3	6.1	5.0	31.1	-2.9
North-East	0.0	1.3	9.2	3.8	6.1	3.1	6.1	2.5	32.2	-0.1
South-East	1.6	2.3	5.9	2.3	1.3	0.0	2.8	5.0	21.2	-9.9
South-Muntenia	1.6	1.9	10.0	0.0	0.7	1.1	10.0	7.5	32.8	-4.2
Bucharest-Ilfov	10.0	10.0	2.5	10.0	10.0	9.0	7.2	7.5	66.1	6.8
South-West Oltenia	1.9	1.1	3.2	0.6	0.0	0.4	5.6	0.0	12.8	-9.1
West	3.9	7.0	0.0	2.3	0.5	1.7	4.2	10.0	29.7	12.9

Source: Calculations based on data provided by the National Institute of Statistics, Tempo-online database.

⁷ The dimensions “life satisfaction”, “community” and “civic engagement” used in the OECD methodology cannot be replicated for the Romanian index.

Considering specific indicators, the South-East region displays the lowest performance of all Romanian regions in environmental well-being (measured by the exposure to particulate matter pollution), and comparatively low scores in most other dimensions, with the exception of housing and accessibility to services. In these two dimensions the region ranks respectively third and fourth among the eight development regions (Figure 19).

Figure 19. Ranking of development regions in Romania by well-being dimension, 2015



Source: Calculations based on data provided by the National Institute of Statistics, Tempo-online database.

If we compare the latest well-being indicators from 2015 with those from 2007 (Table 3), there is some change in the hierarchy among the eight development regions. Bucharest-Ilfov has registered an overall increase of around 7 points between 2007 and 2015. North-West and West have significantly improved their scores during this period, while Centre, South-Muntenia and South-West Oltenia registered losses. The latter group also includes our case study region, with its remarkable loss of 10 points in the compound score. These scores are relative to the best performing region, which means that the South-East region lost ground relative to other Romanian regions between 2007 and 2015.

Table 3. Well-being in Romanian development regions, 2007

Region	Income	Jobs	Housing	Health	Education	Environment	Safety	Access to services	Total score
North-West	1.9	6.2	3.5	3.0	5.7	1.6	3.6	5.2	30.8
Centre	2.1	2.9	2.1	6.9	3.1	1.2	6.1	9.6	34.0
North-East	0.0	0.7	8.6	6.7	10.0	2.2	0.6	3.5	32.3
South-East	1.1	2.1	6.1	5.1	4.3	2.7	0.0	10.0	31.3
South-Muntenia	1.0	1.5	10.0	1.55	6.4	0.0	9.1	7.4	37.0
Bucharest-Ilfov	10.0	10.0	2.1	10.0	2.9	10.0	10.0	4.3	59.3
South-West Oltenia	0.8	1.8	3.6	1.53	2.9	2.0	5.9	3.5	21.9
West	2.8	4.5	0.0	2.7	0.0	2.6	4.1	0.0	16.8

Source: Calculations based on data provided by the National Institute of Statistics (2017).

The main relative losses for the South-East region arose in health, environment, education and access to services, while safety, income and jobs have increased their scores. This result adds an important characteristic to the main finding of the previous part, namely that economic recovery in the South-East region was basically not only a jobless recovery, but it was also accompanied by a relative loss in non-material aspects of well-being compared to other Romanian regions. This is in contrast to most OECD countries, where regions that are catching up do not tend to do so at the cost of reduced well-being (OECD, 2016).

Conclusion

Summarising the empirical results of our paper, we can conclude that despite the unfavourable demographic conditions and demographic outlook, slow job recovery, low levels of R&D activities and declining overall exports, the South-East region's economy recovered well in the aftermath of the global 2007-08 crisis and the 2009-10 recession. Both GDP per capita growth and GDP per capita compared to the EU average have registered considerable increases following the crisis. We have posited and support the main hypothesis, that both labour productivity growth and an increased role for tradable sectors underpin the economic recovery of the region. The GDP per capita of the South-East region has registered the highest growth rate among the eight Romanian development regions and the region's catching-up trend continues, fuelled by high growth rates of labour productivity. However, the question whether these improvements can be sustained into the future and create benefits for all residents remains. The considerable productivity increases were not reflected in gains in regional well-being compared to other Romanian regions and, in addition, there was no significant job recovery. These tendencies combined suggest that the region remains in transition and that the coming years will

be crucial for the development path of the South-East region and should be closely monitored and evaluated.

Acknowledgement: The authors benefited from comments received at the workshop “Regional and national framework conditions to sustain growth in the South East region” held in Constanta on 4 May 2017. Clara Wolf provided excellent research assistance. The views expressed are solely of the authors and can in no way be taken to reflect the official opinion of the OECD or its member countries.

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Annex 1. Selected socio-demographic statistics for the South-East region

	South-East					Romania					
	Annual average growth				2015	Annual growth			average		Low-income regions
	2015	2000-15	2000-07	2008-15		2000-15	2000-07	2008-15	2015	Max	
Demography											
Total population	2 492 350	-1.1	-0.5	-1.8	19 870 600	-0.8	-0.9	-0.5	1 811 700	3 269 600	31 365 475
Elderly dependency rate	26.3	2.4	1.9	3.2	25.2	1.8	1.6	1.5	20.8	28.4	26.1
Economy											
GDP in millions of USD at constant 2010 prices and PPPs	41038	3.3	4.7	1.5	364 044	3.6	6.2	0.0	27 354	98 027	459 914
GDP per capita	16 410	4.5	5.2	3.5	18 285	4.5	7.3	0.5	11 397	42 927	14626
Labour force											
Unemployment rate	9.3	-0.3	-1.2	2.9	7.0	-0.6	-1.8	2.0	3.9	10.8	8.8
Youth unemployment rate	29.3	2.0	2.5	6.9	21.7	1.3	1.8	2.2	9.3	32.3	23.9
Long-term unemployment rate	4.4	1.3	2.9	4.2	3.0	-0.8	-0.9	3.2	0.7	5.6	4.1
Labour force participation rate	63.7	-0.5	-1.7	0.8	66.4	-0.2	-0.5	-0.3	61.3	73.1	67.5
Female labour force participation rate	50.6	-1.3	-2.9	0.5	56.9	-0.7	-1.0	-0.6	50.5	66.2	59.7
Education											
Share of labour force with tertiary education	14.6	4.9	3.9	5.2	18.3	5.7	6.8	4.1	0.0	41.1	25.7
Share of labour force with primary education	29.4	-1.8	-4.0	0.9	25.2	-2.4	-4.9	0.2	10.6	35.7	11.2
Innovation											
R&D expenditures	21.9	-2.3	6.6	-12.4	1155.4	6.5	13.6	-3.8	21.9	630.5	1 785.7
R&D intensity	0.1	-8.8	-1.7	-16.7	0.4	-0.2	4.2	-6.5	0.1	0.8	0.4
	2011	2000-11	2000-07	2008-11	2011	2000-11	2000-07	2008-11	2011		
Patents	2.2	28.3	84.6	44.3	60.3	17.4	14.3	16.8	0.7	32.2	78.6
Patents per million inhabitants	0.9	29.9	85.5	48.3	3.0	18.5	15.5	17.5	0.3	14.1	2.4

Note: Low-income regions are those with GDP per capita of less than 50% of the EU average in 2013.

Source: Eurostat (2017), OECD (2017).