ROMANIA WEST REGION COMPETITIVENESS ENHANCEMENT AND SMART SPECIALIZATION

Economic Geography Assessment:

Territorial Development Challenges In the West Region

March 2013

Intermediate Report

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Executive Summary

Location and Economic Performance in the West Region

The West Region of Romania is the wealthiest region in the country outside of Bucharest, with a per capita GDP 10 percent higher than the national average. For most of the past decade, the region experienced rapid economic growth and convergence with Europe. But the fruits of this growth were not distributed evenly across the region. Substantial inequalities in economic and social outcomes were exacerbated sharply over the past decade.

In both absolute levels of development and growth, Timis County dominates, having moved its GDP per capita from 118 percent of the national average in 2000 to 154 percent by 2010. By contrast Caraș-Severin and Hunedoara lag at only 85 and 83 percent of the national average respectively, some 70 percent below the level of Timis. Meanwhile, Arad failed to maintain its position from the beginning of the decade and fell back toward the national average. This gap in economic performance is matched by virtually every other measure of economic and social outcomes, as well as by measures of endowments and institutions. Timis County, and the wider Timisoara-Arad agglomeration not only outperforms the region as a whole but stands out as a leading region of Romania, in some cases even rivaling Bucharest. By contrast, Caras-Severin, Hunedoara, and the eastern parts of Arad struggle with small populations, outmoded endowments and productive sector, and inaccessibility, resulting in a cycle of low economic activity, declining human capital and workforce participation, and emigration.

Differences in economic outcomes across the region are linked directly to differences in competitiveness. Most notably, Timis, and more broadly the Timis-Arad agglomeration is increasing pulling away from the rest of the region on virtually every measure of competitiveness. This does not mean that the leading parts of the region do not face significant challenges for growth in the future, just that those challenges are somewhat different from those in 'lagging' parts of the region. Indeed, the region faces a dual challenge. On the one hand, in Caras-Severin, Hunedoara, and parts of Arad, the challenge is one of generating and capturing greater employment opportunities. By contrast, in the Timis-Arad agglomeration, the challenge is managing the transition toward a more knowledge and skills intensive basis for competitiveness.

Analyzing the Region in a Territorial Development Model

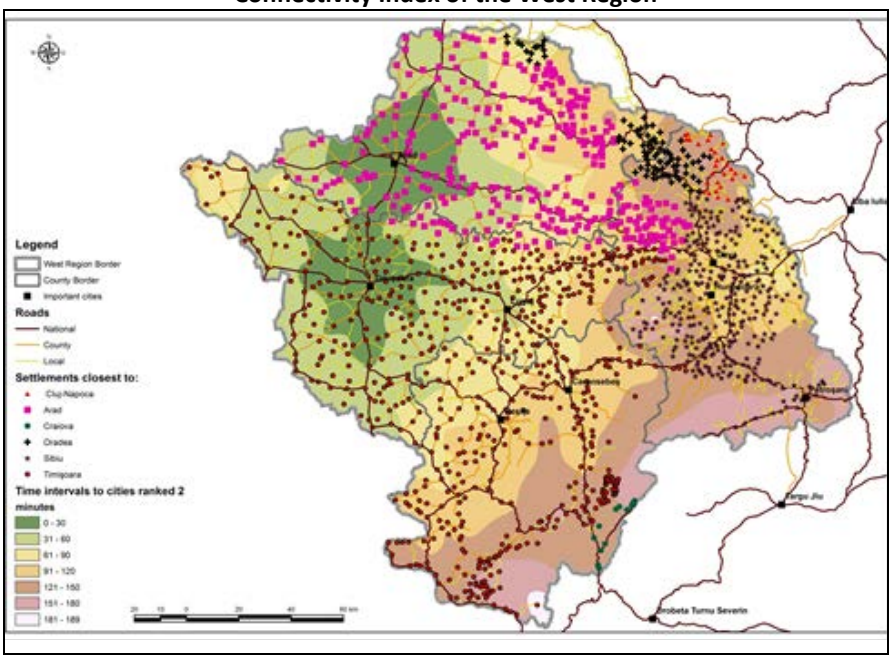
A territorial development model is used to explore how location shapes economic performance in the region. This model brings together the 'people based' and the 'place based' approaches, assessing density, distance, division, and endowments and institutions.

Core-periphery patterns that emerge from processes of agglomeration explain clearly the patterns of density in the West Region. Urban localities in the region account for 90 percent of employment and value added. They support 2.6 times more businesses on a per capita basis than rural localities, four times as many large firms, and twice as many foreign-owned firms. Forces of localization, that give rise to the formation of industry clusters, reinforce urbanization trends, with the main concentrations of employment in all clusters,

whether manufacturing (automotive, textiles), high technology services (ICT), or natural resources based (agri-food) in Timisoara and Arad.

The greater access people and firms in all parts of the region have to these agglomerations, the more productive they will be. Therefore, a second critical component of a territorial development strategy is access, or connectivity – thus, distance matters. To explore the impacts of distance on regional outcomes, a Connectivity Index was developed. The results of this index, shown in the figure below, illustrate clearly the advantage of the region's urban areas, and in particular the western part of the region.

Connectivity Index of the West Region

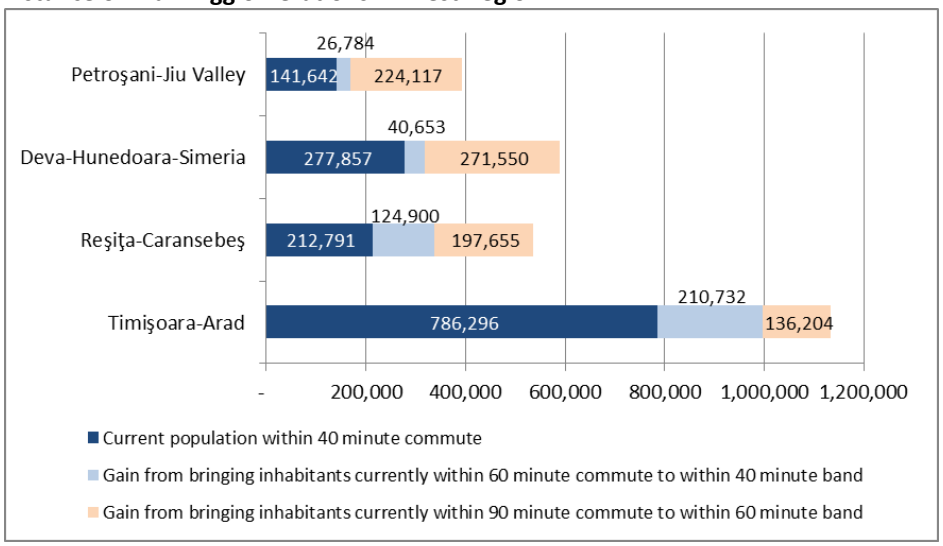


One of the most important challenges in addressing territorial disparities in the West Region is to improve internal connectivity with the region's main urban agglomerations, most importantly with the Timișoara-Arad conurbation. This involves both looking at ways to expand the catchment areas of urban centers to absorb a wider commuting workforce in the region, as well as improving general connectivity to allow businesses, workers, and consumers in the region to benefit from access to a larger market. Overall, the region is relatively well positioned for access to the Timisoara – Arad conurbation, with almost all the western half of Timis and Arad counties – the majority of the region's population – within a one hour road commute. Moreover, leveraging the rail network could offer the region a significant comparative advantage. Estimates show that Timisoara has the largest population outside of Bucharest within a one hour commuting distance.

Comparing the potential impacts of improved connectivity across the four main agglomerations in the region (see figure below) suggests that while the biggest economic impact would probably come from improving connectivity to Timisoara – Arad for those currently living between 40 and 60 minutes from the conurbation, a similar connectivity

improvement would have an even greater relative impact on Resita – Caransebes. Improvements in local connectivity, by contrast, may have a limited impact in the Hunedoara agglomerations, which would gain more from improving broader connectivity with the rest of the region and outside it.

Potential Impact of Connectivity Improvements on the Population within Commuting Distance of Main Agglomerations in West Region



Source: Calculations based on methodology described in Box 4

Three aspects of *division* are likely to impact territorial development in the West region:

1. *The region's disconnection from Bucharest and the rest of the country*: Virtually every settlement in the West Region is closer to either Budapest or Belgrade than they are to Bucharest, and infrastructure connections to the capital (and the rest of the country) remain poor. Major projects like European Corridor IV will play an important role to improve connectivity, not only to Bucharest but also to neighboring regions and cities like Sibiu. This may be particularly important for the lagging eastern parts of the region, which are also distant from other European capitals. It may also be important to support the growth and diversification of the region's exports toward locations like Ukraine, Turkey, and Russia.
2. *The potential unexploited opportunities with Serbia*: Despite Belgrade being the closest major city to almost all of the West Region, Serbia ranks only 19th among the region's export destinations, accounting for just 1% of exports. Taking better advantage of opportunities for trade with Serbia, especially in agricultural products, could be particularly important for parts of Caraș-Severin that are among the most economically lagging in the West Region.
3. *Lagging areas and access to key border posts*: For foreign investors to establish export oriented production in lagging parts of the West Region, connectivity to European markets must be efficient. While Timis and western Arad are ideally located in this respect, most of the rest of the region remains more than one hour away from the closest border point. Reșița is almost 75 kilometers from a border crossing point, as Caraș-Severin has only one border point.

Endowments of the regions reinforce territorial disparities, with lagging counties remaining specialized in sectors linked to their physical endowments – forestry and mining in Hunedoara; mining and metals (as well as wood products) in Caras-Severin. On the other hand, the motor vehicles sector, along with as other manufacturing sectors, is now among the leading areas of specialization in all counties. This suggests that historical endowments are not everything, and that the types of investments that catalyzed growth in Timis and Arad are spreading, at least to some extent, to other parts of the region. Finally, while no comparative data on *institutional* performance exists at the county level, it is apparent that the budgets available to lagging counties, even on a per capita basis, are not likely to be sufficient to narrow existing disparities.

Conclusions

Failure to address growing disparities will not only have an impact on the opportunities and quality of life of many residents in these lagging areas, but will act as a barrier to the growth and development of the region as a whole. Achieving continued strong growth and moving the economy to a higher value added position while also addressing the substantial and deep-rooted spatial inequalities will require a carefully tailored development strategy. Among the elements that this strategy should consider are the following:

1. Continuing to promote FDI, encouraging the 'two-tier' strategy, whereby investors establish research and head office bases in Timisoara-Arad and locate manufacturing in lagging parts of the region.
2. Facilitating the integration of the Timisoara and Arad economies into a metropolitan conurbation with high 'quality of life'.
3. Improving connectivity to the Timisoara-Arad conurbation.
4. Improving connectivity to Bucharest and the rest of the country.
5. Exploiting more the opportunities with Serbia.
6. Supporting entrepreneurship and SME development throughout the region.
7. Promoting local economic development strategies.
8. Building local institutional capacity.

1. Introduction

1.1. Context: Growth but Increasing Spatial Disparities

The West Region of Romania is the wealthiest region in the country outside of Bucharest, with a per capita GDP 13 percent higher than the national average. For most of the past decade, the region experienced rapid economic growth and convergence with Europe. But the fruits of this growth were not distributed evenly across the region. Already substantial inequalities in economic and social outcomes were exacerbated sharply over the past decade.

The experience of West Region is not unusual. This same pattern of aggregate growth and convergence coinciding with growing *intra-regional* disparities is repeated at the national level (where Bucharest has pulled far ahead of the rest of the country), across the European Union (EU), and throughout the world. Economic theories, including endogenous growth, institutionalism, and most importantly the "new economic geography" (NEG), have made significant contributions to explaining the core-periphery patterns behind this divergence. Most important is the process of agglomeration, which confers benefits to urban cores that have the advantages of large markets, deep labor pools, links to international markets, and clusters of diverse suppliers and institutions. Regions relatively near the core are likely to benefit from spillovers and congestion-related dispersion. But regions further removed from the core (that is, the periphery) are not only less able to take advantage of spillovers, but are also more likely to be far removed from key infrastructural, institutional, and interpersonal links to regional and international markets. As a result, they face significant challenges to becoming competitive locations to host economic activity. Thus the geographical pattern of core and peripheral regions is increasingly manifest in an economic pattern of 'leading' and 'lagging' regions.

While these general patterns of economic geography play out in the West Region of Romania, there also exist some elements of the process that are distinct to the region. First, the West's location within Romania would suggest it might be peripheral in the national context, given its distance from Bucharest, and the existence of the Carpathians as a significant barrier to the movement of people and goods between the capital and the West (see the inset map in Figure 1). However, this also highlights the West's locational advantage in a European context. Indeed, since Romania began the process of European Accession, the West Region has benefited immensely from being closer to the core of Europe, rather than (relatively) distant from the core of Romania. Similarly, these locational and topographical factors also help explain the pattern of spatial disparities within the region, with western parts well linked to the European core and eastern parts more distant from it, with the Carpathians forming a barrier to connectivity with the rest of Romania.

Figure 1. The West Development Region of Romania

Source: Map Copyright ADR West

1.2. Why Should We Care about Spatial Disparities?

From a macro efficiency perspective, regional inequality is not necessarily a bad thing. Most evidence points to a positive association between the geographical concentration of economic activity and economic growth at a broader territorial scale (Bourguignon & and Morrison, 2002). This is partly because innovation, increasingly recognized as a fundamental determinant of growth, has been shown to be strongly affected by the concentration, or agglomeration, of economic agents. In fact, innovation and agglomeration appear to be mutually reinforcing processes (Feldman, 1994; Verspagen, 1997).

Yet there are some important downsides to growing spatial disparities, and not simply for residents of lagging areas. As intraregional inequalities grow, average figures of national or regional income become increasingly meaningless, so that an apparently rising economy may actually mask economic stagnation and growing poverty in less fortunate areas. But in most cases the primary concern is one of *relative* outcomes, or equity. Growing disparities across regions may threaten social and political cohesion.

Of course, there is a difference between output inequality and income inequality, and for purposes of cohesion the latter matters more. The degree to which output inequality translates to income inequality depends significantly on two elements: redistribution and factor mobility. Comprehensive tax and transfer programs in most OECD countries narrow regional disparities substantially. Sweden's extremely low regional Gini index of inequality, for example, does not reflect an even geographical spread of output but rather a strong policy of income redistribution. Mobility of labor and capital across regions also represents an important mechanism for addressing regional output disparities. In countries where workers

and investors can easily move from areas of low to high demand, income disparities can be narrowed.

But even allowing for redistribution and fluid factor markets, there are reasons to be concerned about growing disparities in output across regions. First, these disparities may have direct impacts on economic efficiency. From a political economy perspective, even where growing spatial inequalities do not give rise to demands for secession or devolution, they will almost certainly contribute to increasing demand for redistributive policies, which may have a dampening effect on overall growth (Aghion, Alesina, & Trebbi, 2004). From a structural perspective, many lagging regions are not simply failing to keep pace, but they are also failing to make productive use of the resources available to them, leading to output that is significantly below the production possibilities frontier. This, combined with self-reinforcing institutional weaknesses that is often associated with lagging areas, leads to a problem of persistent underdevelopment at the regional level. Such underdevelopment is not just a problem for the lagging area caught in a low growth trap, but it also acts as a drag on regional and national growth potential (Farole, Rodríguez-Pose, & Storper, 2011). Finally, while mobility should be encouraged to enable individuals to follow economic opportunities, this too has potential drawbacks. Most notably, labor mobility contributes to significant rural-urban shifts that risk overwhelming the infrastructural, environmental, and institutional capacities of major metropolitan regions, particularly in developing and transition countries.

Whatever the aggregate picture may be, the prospect for an individual firm to reap the benefits that accrue from globalization may depend as much on the neighborhood as on the country in which it operates. An endogenous relationship exists between income and many of the determinants of firm success, including both external factors, like education and infrastructure, and firm-level factors, like innovation and productivity. Therefore, firms in more advantageous geographical positions may become increasingly more competitive relative to those in lagging territories. Failing to address some of the root causes of regional disparities may condemn firms in lagging territories to operate on an increasingly unlevel playing field, which is likely to contribute to further widening of the gap in outcomes between leading and lagging regions. Again, interregional mobility allows some possibility for individual firms to seek out those regions that best meet their needs (for skills, endowments, and so forth), but there will be limits to the extent of this mobility, more so in some countries and regions than in others.

1.3. Objectives and Structure of this Report

This report – *Economic Geography Assessment: Territorial Development Challenges in the West Region* – is part of a wider study being carried out by the World Bank under the *Romania West Region Competitiveness Enhancement and Smart Specialization* project. The main objective of the overall task is to develop an in-depth competitiveness and smart specialization assessment of services and goods producers in the West Region, and to identify policy measures, interventions and smart specialization niches that can help nurture their growth potential. Recommendations are expected to provide the basis for the design of the

instruments to be financed in the 2014-2020 programming period from EU Structural Funds, among other sources.

The *Economic Geography Assessment* has several objectives – it aims to: i) outline the extent and nature of intra-regional disparities in the West Region; ii) assess the main factors contributing to these disparities; iii) highlight their importance in defining the development challenges for the West Region; and, iv) identify policy measures and interventions that can support continued rapid growth in the region, while ensuring that growth is as inclusive as possible.

Following this introduction, the next section of this report summarizes spatial development patterns in the West Region, assessing differences in economic outcomes across different parts of the region. It also assesses how firm-level performance varies depending on location. After this is a brief section outlining a model for understanding territorial development challenges, followed by sections that analyze the determinants of these spatial outcomes, based around the territorial development model, covering density, distance, division, and endowments and institutions. The final section of the report outlines some policy priorities based on the findings of the analysis.

2. Geography and Economic Performance in the West Region

2.1. County-Level Economic Outcomes

The West Region – including the counties of Arad, Caras-Severin, Hunedoara, and Timis – is among the most developed of Romania's eight (NUTS-2 level) development regions, ranking second highest, after Bucharest-Ilfov, in per capita GDP. As Figure 2 shows, Romania's 'lagging' regions are concentrated in the southern and eastern parts of the country – none of the four counties in the West Region would be considered lagging in the national context[1].

Figure 2. Leading and Lagging Counties of Romania (2009)

Source: World Bank, 2012

But look within the West Region and the disparities are stark (Table 1). In both absolute levels of development and growth, Timis County dominates, having moved its GDP per capita from 118 percent of the national average in 2000 to 154 percent by 2010. By contrast Caraș-Severin and Hunedoara lag at only 85 and 83 percent of the national average respectively, some 70 percent below the level of Timis. Meanwhile, Arad failed to maintain its position from the beginning of the decade and fell back toward the national average. As a result, Timis now accounts for almost half of the region's GDP, while the contribution of the other three counties has declined significantly over the last decade (Figure 3).

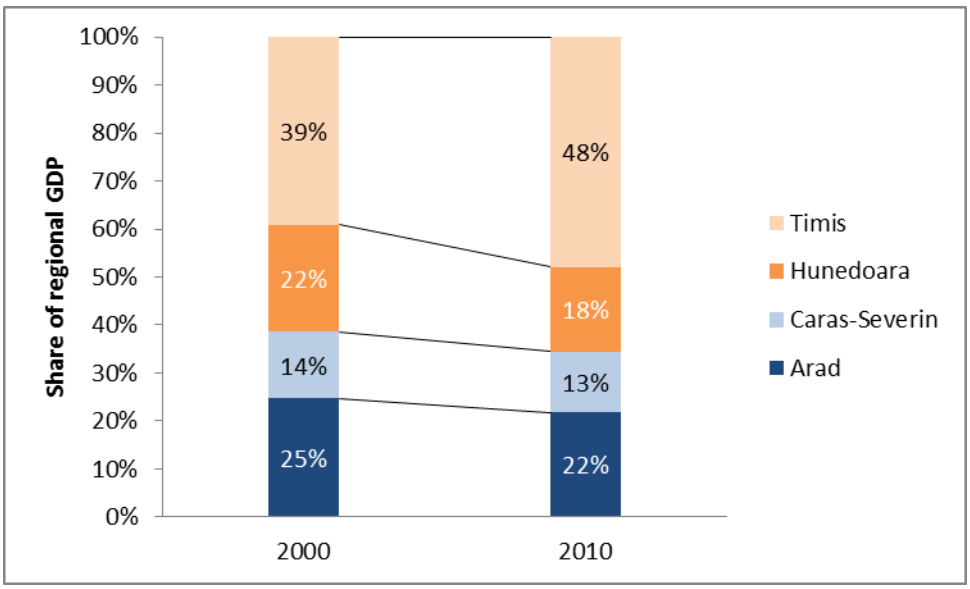
[1] 'Lagging' here refers to counties with a GDP per capita of 75% or less of the national average (this being the threshold used to define lagging regions at the European level, in the context of eligibility for Structural Funds.)

Table 1. GDP per Capita in Counties of West Region (Euro, at purchasing power standard)

	2000		2010	
	GDP per capita at PPS	Index to Romania avg.	GDP per capita at PPS	Index to Romania avg.
Arad	5,400	108	11,900	104
Caras-Severin	4,100	82	9,700	85
Hunedoara	4,400	88	9,500	83
Timis	5,900	118	17,500	154
West average	5,100	102	12,900	113
EU-27 average	19,000	380	24,500	215

Source: Calculations based on data from Eurostat: Gross domestic product (GDP) at current market prices by NUTS 3 regions – purchasing power standard per inhabitant [nama_r_e3gdp]

Figure 3: Contribution of Counties to West Region GDP

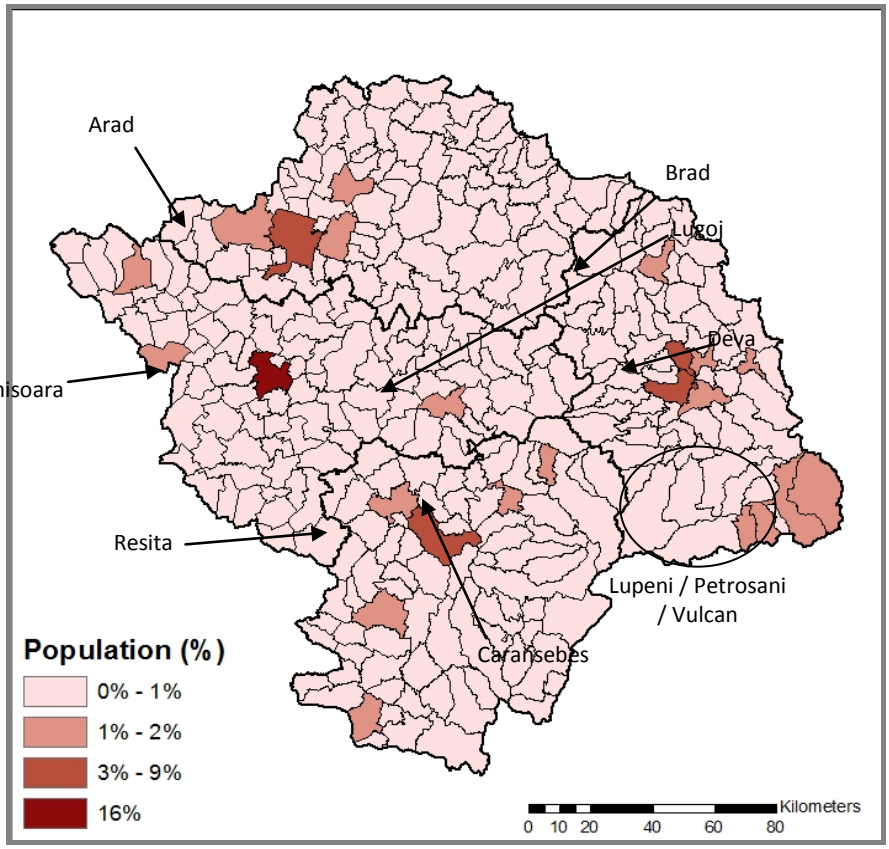


Source: Calculations based on data from Eurostat: Gross domestic product (GDP) at current market prices by NUTS 3 regions – millions of Euro [nama_r_e3gdp]

These disparities in income are linked to the concentration of population and economic activity in the main urban areas of the region. It is apparent from Figure 4 and Figure 5 that while the cities of Arad (and its eastern and western fringes) and Timișoara concentrate the region's population, the influence of the cities (including the industrial areas to the south and east of Timișoara) in terms of economic output is even stronger. By contrast, other urban

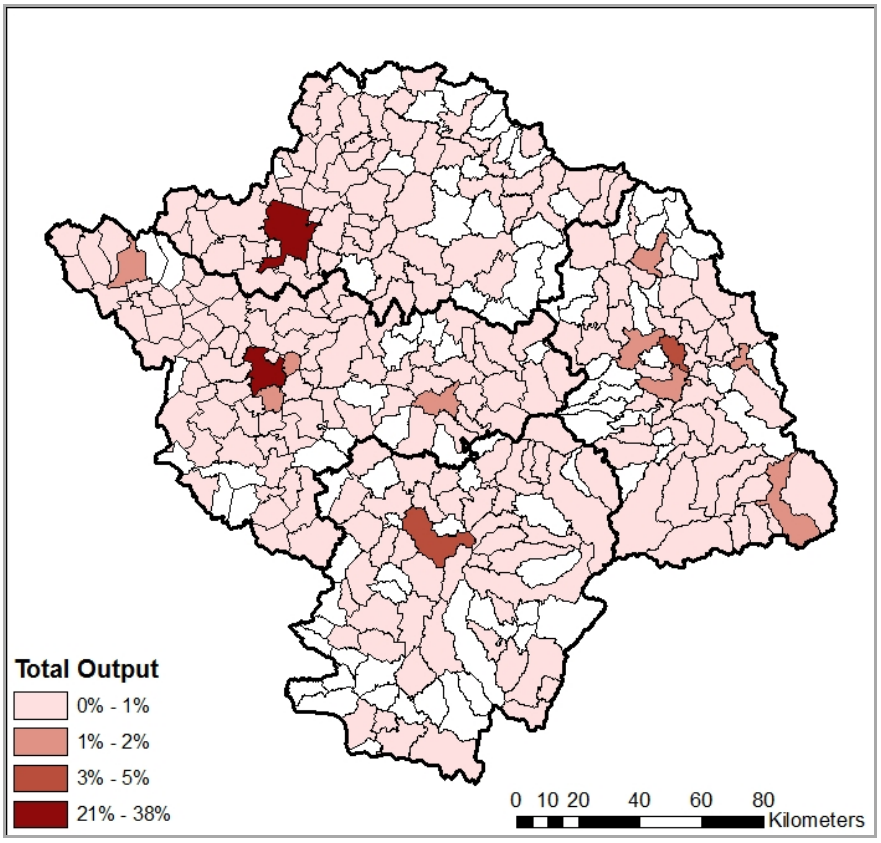
centers like Resita and Deva, and the area around the towns of Petrosani, Lupeni, and Vulcan account for relatively less economic activity than their population would suggest. Overall, value added per capita in the urban localities of the West Region stood in 2010 almost 2.4 times greater than that in rural localities.

Figure 4. Distribution of Population by Locality - West Region



Source: Calculations based on data from Institute of National Statistics; Map Copyright ADR West

Figure 5: Output by Locality - West Region



Source: Calculations based on data from Structural Business Survey; Map Copyright ADR West

For the population of the West Region, concentration of economic activity matters principally because it means that the availability and quality of employment opportunities is spread unevenly across the region. In the absence of mobility, whether via commuting of migration, this would be expected to result in uneven rates of employment. In fact, the differences across counties are dramatic. While the West region as a whole had an unemployment rate below the national average in 2011, this is skewed by the extremely low rate (2.2 percent) in Timis County. The rest of the region had significantly higher rates of unemployment, with Arad and Hunedoara recording unemployment rates well above the national average and more than 3.5 times the level in Timis (Table 2). This gap between Timis and the rest of the region grew dramatically over the decade. According to the data from Eurostat, Timis virtually eliminated unemployment over the period 2002 through 2008, while Caras-Severin and Hunedoara also reduced unemployment substantially.

By contrast, according to Eurostat data, the rate of unemployment actually increased in Arad, from a low of 4.4 in 2001 to 8.1 in 2008. This is surprising given the evidence that Arad is the second wealthiest county on a GDP per capita basis. It also stands in stark contrast to the data from INS, which suggests unemployment in Arad is the lowest in the region.

Labor force participation rates also vary significantly across the region. Perhaps surprisingly, they are highest in Caras-Severin and Hunedoara which, in contrast to national trends, did not experience declining participation between 2002 and 2008. Overall, outside of Caras-Severin, however, Timis has the highest share of economically active population in the region, underscoring its position as the primary job creating location in the region.

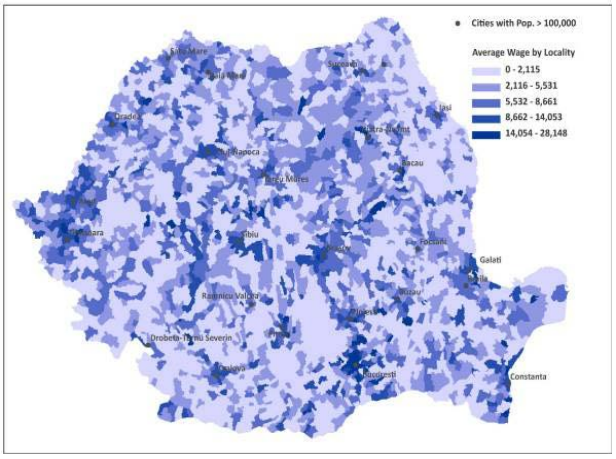
Table 2. Unemployment and Economic Rates by County - West Romania (population age 15+) 2000-2008

		2000	2001	2002	2003	2004	2005	2006	2007	2008
Unemployment rate (15+)	Arad	6.8	4.4	5.4	6.2	7.9	6.9	7.8	7.4	8.1
	Caras-Severin	10.6	7.3	9.9	11.0	11.4	8.4	7.6	7.1	6.9
	Hunedoara	8.4	5.7	6.8	8.5	9.7	7.9	8.0	7.1	7.8
	Timis	6.0	3.8	4.8	5.7	6.4	4.9	4.0	2.7	2.2
		2000	2001	2002	2003	2004	2005	2006	2007	2008
Economic activity rate (15+)	Arad	n/a	n/a	64.1	56.6	53.4	49.9	55.3	58.1	55.8
	Caras-Severin	n/a	n/a	70.0	68.5	71.2	72.0	76.4	80.2	80.2
	Hunedoara	n/a	n/a	60.3	55.4	56.3	55.4	57.3	59.3	59.9
	Timis	n/a	n/a	70.7	69.5	72.1	69.1	67.5	65.5	64.3

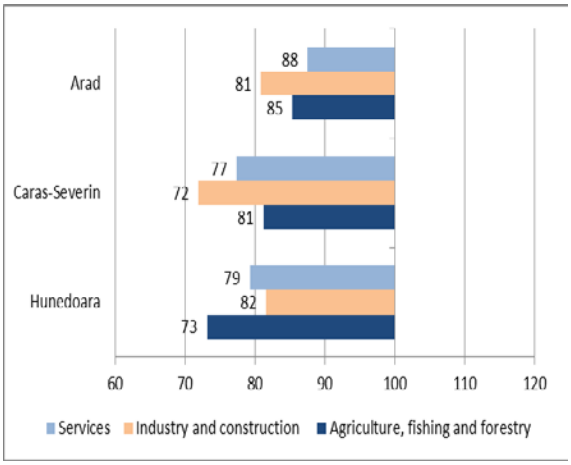
Source: Unemployment rate from Eurostat: unemployment rate, 15 years and over from "Unemployment rates by sex, age and NUTS 3 regions (%) [lfst_r_lfu3rt]"; Economic activity rates calculated as economically active population 15 years and over divided by regional population 15 to 64 years from "Economic activity rates by sex, age and NUTS 2 regions (%) [lfst_r_lfp2actrt]" and "Population on 1 January by broad age groups and sex - NUTS 3 regions [demo_r_pjanaggr3]"
Note: data at Romanian county level only available through 2008 for unemployment and 2002 through 2008 for economically active population.

Labor market disparities, along with differences in the skills composition of the labor force, has an impact on wage levels across the counties. Figure (6a) shows that the West Region is a leader in the national context, with the largest concentration of high wage localities in the country outside of Bucharest. But it is also apparent that this concentration is in the Timișoara-Arad agglomeration; outside of this are large gaps in the rest of the region, where average nominal wages are considerably lower. The nominal wage gap with Timis is greatest for Hunedoara and Caras-Severin, where average wages are 20-30% lower than in Timis; in Arad overall the wage gap with Timis is about 15%. As Figure (6b) illustrates, the wage gap also varies by sector, with the manufacturing and construction sector showing, on average, the largest gap.

Figure 6. a.) Wage Distribution by Locality - Romania (2010);
b.) Average gross monthly wages (April 2011-April 2012) – Indexed to Timis County



Source: World Bank, 2012



Source: Calculations based on data from Institute of National Statistics; Monthly gross wages at NACE 2

While the nominal wage differences are partly a function of differences in the cost of living[2], it appears that they also reflect real differences in productivity and skills across counties. The West overall outperforms the national in terms of labor productivity – as of 2009 labor productivity in the West Region stood 11 percent higher than the national average. This is again skewed by particularly high labor productivity in Timis, which stands 26 percent above the national average. What is striking in Table 3, however, is the substantial growth in relative productivity achieved across the region as a whole, with the notable exception of Hunedoara. Caraș-Severin improved productivity by almost 20 percent annually during the decade, and Arad was not far behind. This helps explain why these counties managed to grow so rapidly without adding net jobs.

Of course, variation in productivity performance across places is partly a function of the different sectoral specialization of the counties. To control for this, it is instructive to look at performance within sectors. Figure 7 shows the clear advantage of Timis across the region's most important industry clusters. The gap is most apparent in ICT and automotive, while in textiles and agri-food other counties also perform above average (Arad and Caras-Severin, respectively). This picture, combined with the substantial wage gaps which are also apparent in within-sector comparisons, suggests there are significant differences across counties in the nature of activities in which firms are choosing to invest across the region.

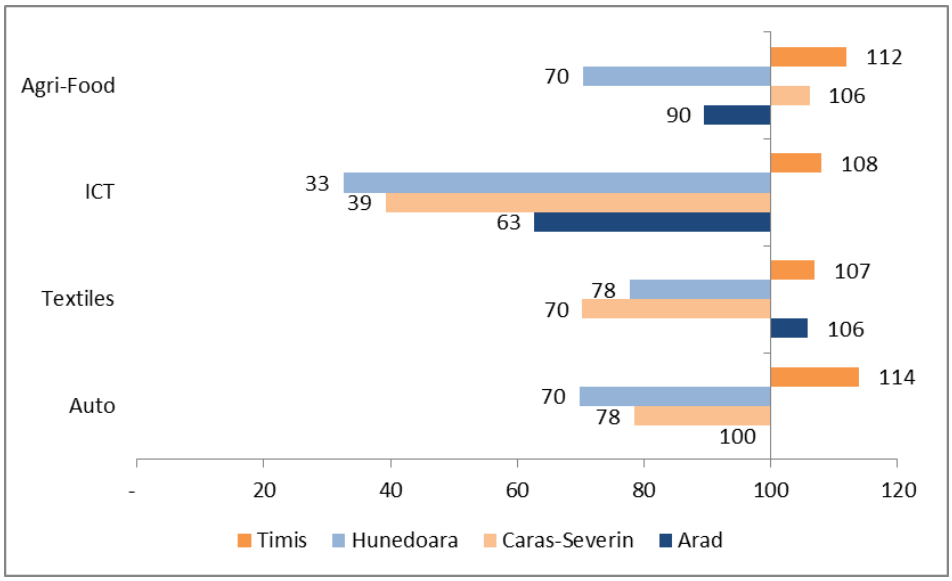
[2] The only relative price data we have available is on food prices by municipality. Taking the average prices of a basket of goods in November 2012 in the main cities of each county, we find Timis with the highest prices; Arad's price basket was around 5% lower, with Hunedoara and Caras-Severin 9% and 10% lower respectively.

Table 3. Labor Productivity Across Counties in the West Region (2000 and 2009)

	2000		2009	
	Productivity (Euro per worker)	Index to Romania avg	Productivity (Euro per worker)	Index to Romania avg
Arad	2,591	76	11,855	103
Caras-Severin	2,601	76	13,306	116
Hunedoara	3,217	94	10,640	92
Timis	3,615	105	14,541	126
West average	3,637	106	12,799	111

Source: Calculations based on data from Eurostat (see note below)
Note: Labor productivity for country and regional level calculated as 'gross value added at basic prices' (millions of current euros; source: National Accounts) divided by 'total employment' (original source: Labor Force Survey Series3) – for country & regional level; for county level calculated as 'gross value added at basic prices' (millions of current euros; source: National Accounts) divided by 'total employed persons' (original source: National Accounts)

Figure 7. Comparison of Value-Added Per Worker (2010) in West Region's Main Clusters (Index: West Average= 100)



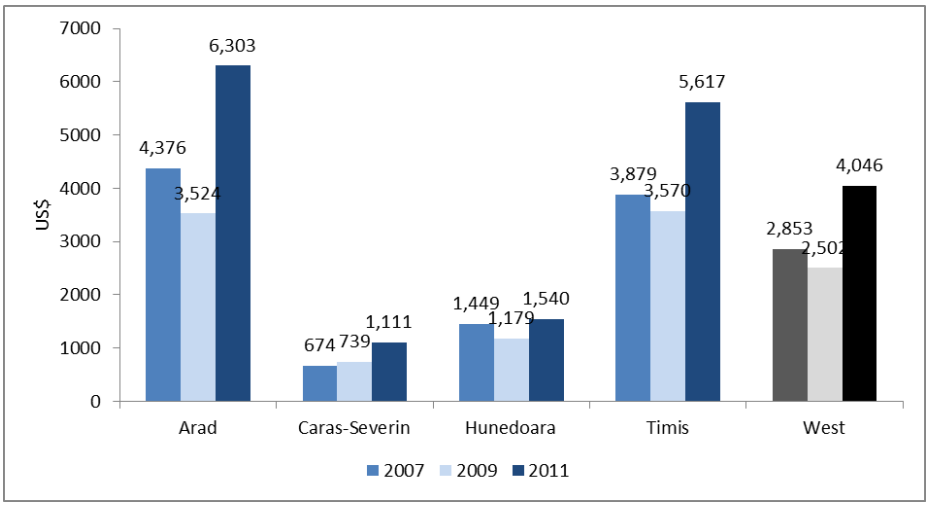
Source: Calculations based on data from Structural Business Survey
Note: In the Auto cluster, the index for Arad is 100 (equal to the regional average) – therefore no bar is visible in the figure.

[3] Our preference is to use the LFS series whenever possible to be consistent with the unemployment data we use, which is also from LFS. Note that the differences in the figures for total employment between the LFS and National Accounts databases are minor.

Finally, among the biggest cross-county differences can be found in looking at performance in export markets. Export orientation matters for several reasons. First, growth in the West Region, and in Romania as a whole, has been closely linked to trade integration with the rest of Europe, with export performance and economic performance increasingly going hand in hand. For the West Region, exports have been particularly important, given its location and links with Europe, and its relative distance from the core of Romania. Second, the ability to compete in export markets is an important proxy for competitiveness of firms and regions. Thus, export participation and performance can be viewed as a measure of the degree to which the region is a competitive location for doing business. Finally, in a dynamic sense, participation in trade (both exports and imports) is a critical channel for learning and technology acquisition, which is shapes competitiveness over the medium and long term.

Figure 8 illustrates how significant are the gaps in export performance across the region. Here, however, Arad stands out even ahead of Timis. But most important is the gap between them and the counties of Caraș-Severin and Hunedoara, where exports per capita are four to five times lower than they are in Arad and Timis. Caraș-Severin has expanded its participation in trade significantly in recent years, although this is from an extremely low base – for example, in 2009 the export share of GDP in Caraș-Severin was only 11.4 percent and the import share only 9 percent, compared to almost 46 percent and 41.4 percent in Arad.

Figure 8. Exports per Capita (2007, 2009, 2011)



Source: Calculations based on data from Institute of National Statistics (Customs transaction data)

2.2. Sectoral Performance and Growth Prospects

While economic performance varies substantially across the region, economic structure is less varied. This is potentially important in considering future growth opportunities, as it suggests that traditional specializations are becoming less important in defining local economies. Looking at basic data on the 10 largest employment sectors (NACE 2 digit) in each county of the West Region (see Annex 1), the most notable feature is the presence of the automotive sector as the leading sector in all counties except Hunedoara,

where it is second behind the mining sector, the county's dominant traditional sector. In Caras-Severin, which has few large sectors, the automotive sector employed just 206 people in 2008, but became the largest employing sector in the county by 2010.

Similarly, manufacturing of food and apparel or footwear (leather) appears across all counties. A second common theme across the counties is that, with the notable exception of the automotive sector, employment has been in decline in recent years in all of the other leading sectors in each county. In fact, in Arad, Caras-Severin, and Hunedoara, every other of their top 10 sectors, including both goods and services, has experienced declining employment between 2008 and 2010. Timis has fared slightly better, with growth in some services sectors, including land transport, warehousing, and a small increase in employment in manufacturing of rubber products.

While the sectoral structures across counties are becoming increasingly similar, where the differences show up now is in wages. Here Timis shows a clear advantage, with Arad performing well in some sectors. By contrast the structural challenges in Caraș-Severin and Hunedoara become readily apparent in the wage data. In both counties, high wages are found in the traditional sectors (basic metals and mining, respectively), which are in decline. Across the more dynamic sectors in these counties, wages are relatively low. This highlights the challenges these counties may have in attracting labor that is being displaced from traditional industries. Wages are also well below the regional (and national) averages for these sectors, confirming the findings in Figure 6, and suggesting there is significant variation in the nature of the activities (within sectors) that are being performed in each county.

Sector growth performance impacting the counties of the West Region is of course taking place within a wider national and European context. In fact, many of these trends are driven strongly by trends taking place across Romania. Therefore, looking at county-level sectoral performance along with national trends will not only help put performance in better context, but can identify where future growth potential in the counties may be coming – in other words, it may give a picture of how future changes in local specialization may be evolving. Figure 9 maps an employment-based shift-share growth decomposition (see Box 1 for a description of the methodology) for each county over the 2008 to 2010 period – this is the latest period available, although it is not ideal given that it coincides with a period of economic decline. On the other hand, this matters less for the shift-share analysis as these same macro trends affected national sectoral performance as well.

The shift-share assessment gives an interesting picture of emerging specialization in the region. Most prominent is the size and performance of the automotive sector, which grew strongly at the national level, but even more rapidly in every one of the counties of the West Region, most notably in Caras-Severin, but also in Timis and Arad. Outside of automotive, most manufacturing sectors across the counties performed in line with national averages, with the notable exception of growth in computer and electronic manufacturing both in Arad and Hunedoara.

Box 1. Shift-Share Growth Decomposition

A shift-share analysis assesses the performance of the sectors of a local economy reference to a larger reference economy (most commonly, the national economy). The analysis is typically measured by employment growth, but can also be done on output or value added growth. Specifically, the shift-share analysis calculates how much of the employment growth experienced by a local economy in a specific time period can be explained by: i) the economy's mix of sectors, because different sectors are growing at different rates; ii) the national growth rate, because one can expect some correlation between the national and local growth rate; and iii) local factors, in other words the competitiveness of the local economy in the sector.

Calculating the shift term for a sector involves first calculating the growth rates for the local economy and for the reference economy (either the regional or national economy). This is calculated as:

$$\text{Growth rate} = (e2 - e1)/e1$$

where $e2$ = employment at time period 2, and $e1$ = employment in time period 1. The shift term is then calculated as:

$$\text{Growth rate sector } x \text{ (local economy)} - \text{growth rate sector } x \text{ (reference economy)}$$

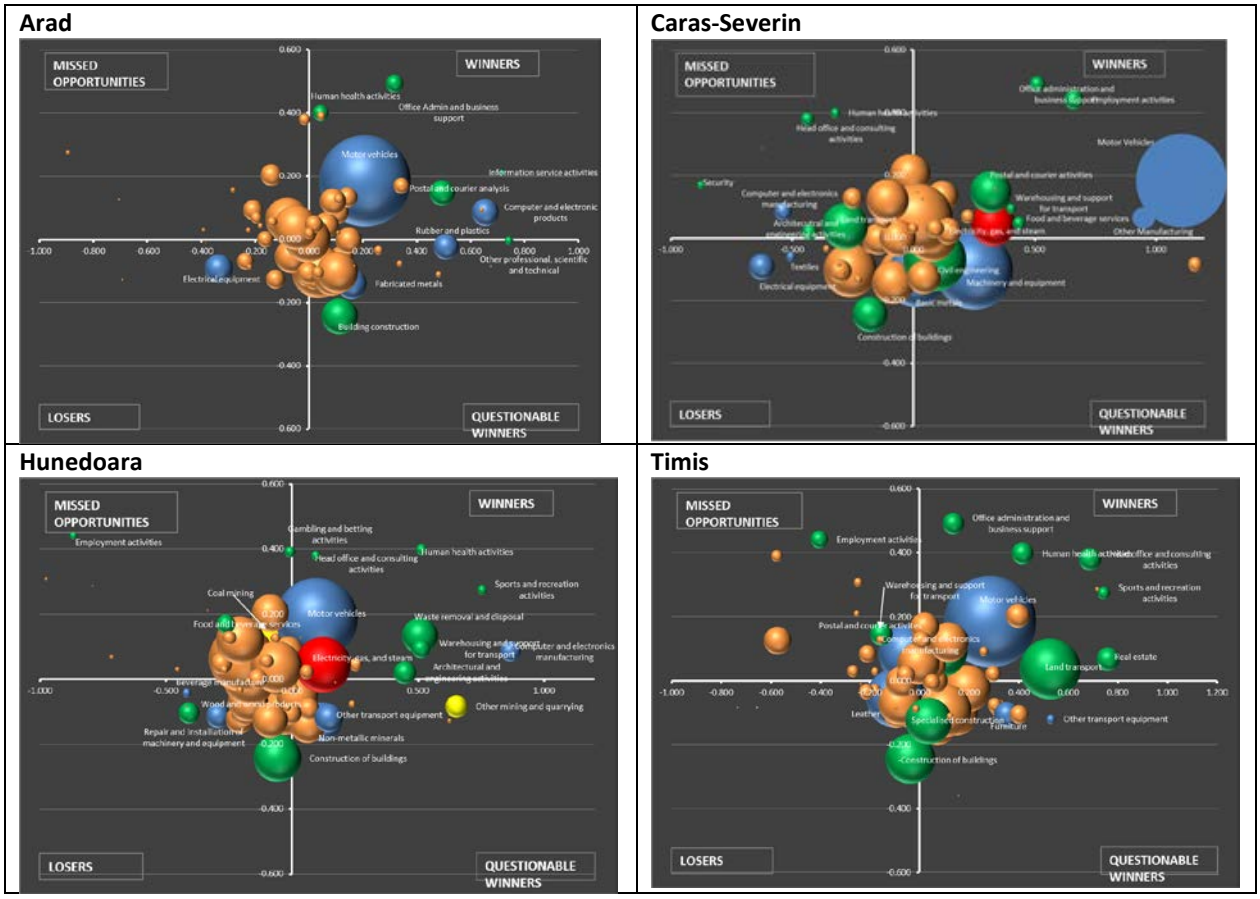
If the shift term is positive, the local economy is growing faster than the reference economy in the sector. But a negative shift term indicates that the local economy is growing slower than the reference economy in the sector.

The shift-share analysis presented in Figure 9 is based on employment growth in the counties referenced against the national economy over the period 2008 to 2010. The four quadrants of the graph are categorized as follows:

- *Winners (upper right):* sectors where employment is growing in Romania and growing in the local economy faster than in Romania as a whole.
- *Losers (lower left):* sectors where employment is declining in Romania and declining in the local economy faster than in Romania as a whole.
- *Questionable Winners (lower right):* sectors where employment is declining in Romania but either growing in the local economy or declining in the local economy more slowly than in Romania as a whole.
- *Missed Opportunities (upper left):* sectors where employment is growing in Romania and either declining in the local economy or growing more slowly in the local economy than in Romania as a whole.

Source: Cities Alliance, 2008

Figure 9. Shift-Share Growth Decomposition for West Region Counties - Employment Based (2008-2010)



Source: Calculations based on data from Structural Business Survey

Note: bubble size reflects 2010 sectoral employment in county; color reflects broad sector (yellow=primary; blue=manufacturing; red=utilities; green=services; orange=sectors not labeled in this figure); Note that in the figures for Caras-Severin, the bubble representing "motor vehicles" and "other manufacturing" actually show up much further along the x-axis, but the axis has been truncated to allow the other sectors to be viewed more easily.

But it is in services sectors where the counties have experienced most rapid growth (from a small base) and the most significant variation across them. For example, Timis experienced strong growth (in nominal and relative national terms) in activities like "head office and consulting", "human health", "real estate" and "sports and recreation", in line with what would be expected from an emerging urban agglomeration, with specialization in higher skill "common-control" activities, along with tourism (e.g. conferencing). Caras-Severin, meanwhile, also experienced significant growth in services sectors, but this came in "office administration and business support" (which includes back office and call center activities) and "employment activities", in line with the specialization that would typically emerge in a more peripheral location.

Further evidence that Timis, at least, is moving toward higher skill and higher value added activities can be found by looking at the number of workers employed in research and

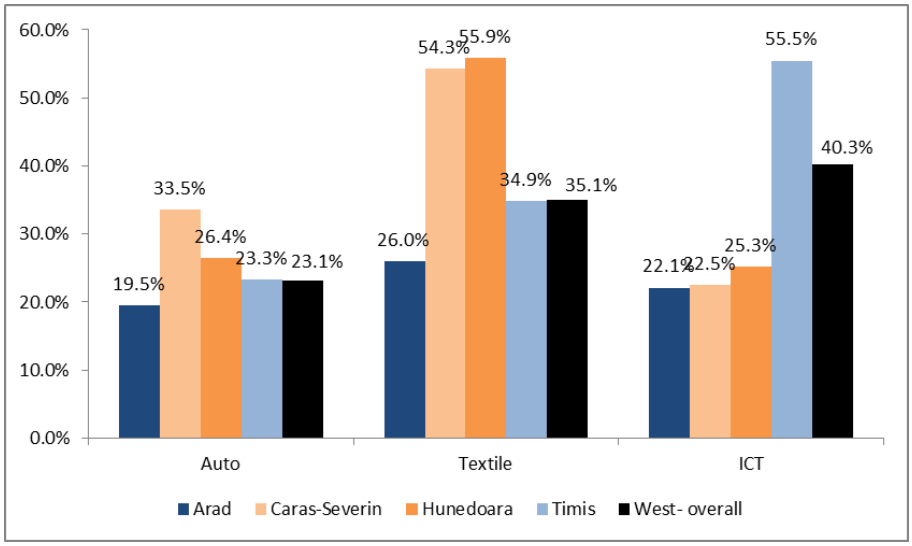
development activities. While in Hunedoara and especially Caras-Severin, the numbers are small (less than 500 and less than 200 respectively) and declining over the decade, in Timis they increased from around 1,000 to almost 3,000 between 2008 and 2010. Arad also experienced growth from levels below even Caraș-Severin early in the decade to nearly 1,000 today.

Finally, one important aspect of sectoral performance in the region is the value added contribution of output. As discussed in the "Territorial Assessment" report, the region's increasing participation in European value chain production has resulted in significant declines in the value added share of output, particularly in sectors like automotive and textiles. In the automotive cluster value added share of output in the region declined from 30 to 23 percent between 2008 and 2010; in textiles it went from 50 to 35 percent.

Figure 10 shows that while these trends have impacted production across all parts of the region, the 'lagging' counties actually have a higher value added share of output than the 'leading' counties. This is particularly in the textiles sector, but also in auto. These differences are not explained by differences in the structure of firms (e.g. small versus large firms or foreign versus domestic firms) – foreign firms, large firms, and small firms all have great higher value added share of output in the 'lagging' counties. This suggests that there must be within-sector differences in the activities or nature of production across the counties. One possibility is that firms substitute capital for labor depending on the location[4]; most likely this is not a like-for-like factor substitution but actually represents differences in the nature of activities and skills requirements across locations. This is supported by the finding that the wage share of output is significantly higher Hunedoara and Caras-Severin than in Timis and Arad, while the value added per worker is significantly lower. On the other hand, the results underscore the heavy reliance of even Timis and Arad on imported inputs and the relatively low overall value addition taking place across the region.

[4] With labor contributing to the calculation of value added

Figure 10. Value-Added Share of Output in West Region Strategic Clusters (2010)



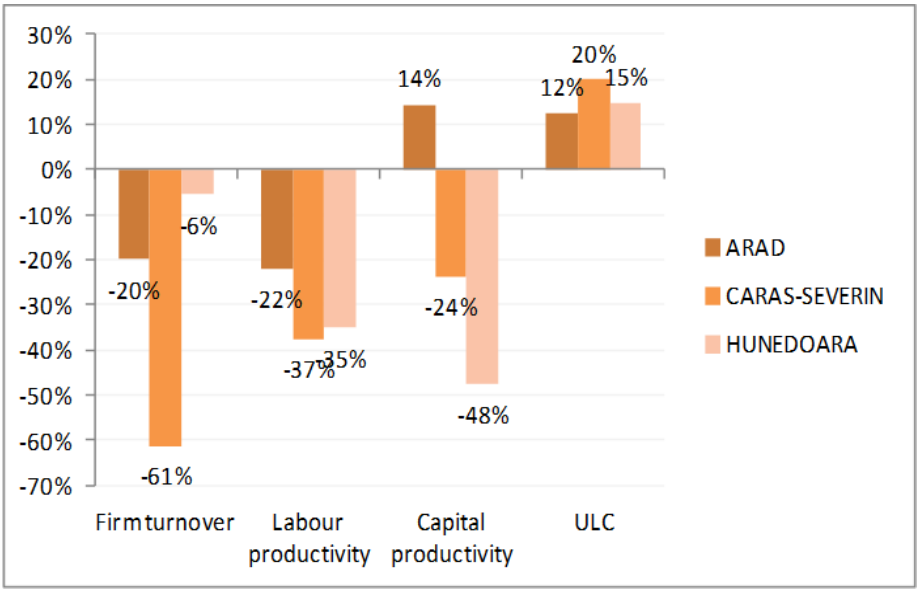
Source: Calculations based on data from Structural Business Survey

2.3. Location and Firm-level Performance

Aggregate outcomes presented above are driven by the performance of individual firms, their market serving strategies, and of their decisions of whether to invest, where to invest, and how to invest (e.g. in capital or labor). Figure 11 illustrates the significant differences that exist across counties when considering the average firm, and in particular highlights the performance advantage of firms in Timis. The average firm in Arad has an output 20 percent lower than in Timis, labor productivity 22 percent lower and, although capital productivity is higher in Arad, overall unit labor costs are 12 percent higher than in Timis. Both labor and capital productivity in Hunedoara and Caraș-Severin are substantially below the level in Timis.

What explains these differences? One candidate is the market serving strategies of the businesses, most importantly the degree to which they participate in export markets. Research on trade and firm heterogeneity shows clearly that the most productive firms are the ones participating in export markets. In the West Region, not only do Arad and Timis have substantially greater firm density than in Hunedoara and Caras-Severin, but these firms are significantly more likely to export – the likelihood of a firm in Arad (where export participation is highest) being an exporter is 67 percent greater than in Caraș-Severin and 50 percent greater than in Hunedoara. And the average firm in Arad and Timis exported around 40 percent of their output in 2010, while in Caraș-Severin and Hunedoara, the average firm exported only half that level of output. Differences in firm productivity, however, do not come from within these exporters.

Figure 11. Output and Productivity of Average Firm Indexed to Timis (average 2008-2010)[5]



Source: Calculations based on data from Structural Business Survey

A comparison of the mean and median firm in the West Region's strategic clusters (Table 4) suggests that the size distribution of firms across the counties may explain some of the differences observed in productivity. Across all four strategic clusters, the mean firm in Timis has the highest (labor) productivity and in most cases (with the exception of agri-food) the largest output and employment. This is followed by Arad in all cases but in agri-food, with Hunedoara and Caraș-Severin trailing far behind. But the picture looks quite different when assessing performance of the median firm. Here, firms in Timis still stand out as top performers, particularly in the automotive cluster, but firm size and in some cases productivity is often higher in the manufacturing clusters in Caraș-Severin and Hunedoara. This difference between the mean and median suggests two likely differences in the structure and distribution of firms in leading and lagging parts of the West Region. Specifically, lagging counties are dominated by a few very large firms, but there are gaps in: i) the emergence of new firms (few dynamic SMEs); ii) the growth of mid-sized firms (a "missing middle"); and iii) the emergence of a wider set of large FDI. By contrast, a county like Timis tends to host several large multinationals but also has a long tail of domestic market serving SMEs, which drives down productivity statistics of the median firm, but serves as an important base for employment.

[5] Note that the results presented in Figure 1111 on relative labor productivity is significantly different than the data presented in Table 3. Four possible explanations for these differences are: 1) data source and sample: Table 3 draws from Eurostat aggregate figures while the data here is from the INS Structural Business Survey, which only includes a random sample of firms below 20 employees; 2) period: Table 3 covers 2000 and 2009, while the data in this figure are for the average over the crisis period (2008-2010); and 3) currency: Table 3 is in Euros and the data in this figure is in Romania Lei.

Table 4. Summary Statistics by Strategic Cluster across Counties - Mean and Median Firm (2010)

SUMMARY STATISTICS BY STRATEGIC SECTOR - MEAN FIRM				
county	cluster	turnover	employment	labor productivity
Arad	Agri-Food	13,283,364	112	33,291
Caras-Severin	Agri-Food	**59,695,582**	**263**	**39,459**
Hunedoara	Agri-Food	14,004,964	132	26,143
Timis	Agri-Food	**43,313,797**	**194**	**41,624**
Arad	Auto	**230,200,000**	**988**	**45,702**
Caras-Severin	Auto	54,781,317	512	35,887
Hunedoara	Auto	73,772,438	614	31,934
Timis	Auto	**263,600,000**	**1,202**	**52,146**
Arad	ICT	**38,628,549**	**203**	**45,130**
Caras-Severin	ICT	2,237,856	43	28,218
Hunedoara	ICT	2,892,478	32	23,428
Timis	ICT	**101,600,000**	**727**	**77,727**
Arad	Textiles	**58,385,525**	**511**	**29,935**
Caras-Severin	Textiles	10,308,711	282	19,861
Hunedoara	Textiles	14,762,845	386	21,990
Timis	Textiles	**49,806,896**	**577**	**30,237**

SUMMARY STATISTICS BY STRATEGIC SECTOR - MEDIAN FIRM				
county	cluster	turnover	employment	labor productivity
Arad	Agri-Food	3,047,110	28	**26,192**
Caras-Severin	Agri-Food	**43,685,047**	**137**	**52,301**
Hunedoara	Agri-Food	6,709,153	**81**	19,587
Timis	Agri-Food	**8,509,282**	54	24,956
Arad	Auto	4,639,763	48	**48,079**
Caras-Severin	Auto	**16,997,777**	**125**	40,847
Hunedoara	Auto	**12,526,209**	**96**	45,640
Timis	Auto	8,010,767	60	**52,290**
Arad	ICT	875,287	**21**	25,854
Caras-Severin	ICT	552,172	13	19,006
Hunedoara	ICT	**1,362,690**	13	**42,173**
Timis	ICT	**2,493,432**	**16**	**34,112**
Arad	Textiles	**4,572,904**	80	18,920
Caras-Severin	Textiles	2,148,476	**109**	13,314
Hunedoara	Textiles	4,230,742	**157**	**20,762**
Timis	Textiles	**8,962,710**	83	**37,782**

Source: Calculations based on data from Structural Business Survey
Note: Bold and shaded cells indicate top two counties in each category

2.4. Conclusions

This section highlighted that the significant differences in economic outcomes across the region are linked directly to differences in competitiveness. Most notably, Timis, and more broadly the Timis-Arad agglomeration is increasing pulling away from the rest of the region on virtually every measure of competitiveness. This does not mean that the leading parts of the region do not face significant challenges for growth in the future, just that those challenges are somewhat different from those in 'lagging' parts of the region. Indeed, the region faces a dual challenge. On the one hand, in Caras-Severin, Hunedoara, and parts of Arad, the challenge is one of generating and capturing greater employment opportunities. By contrast, in the Timis-Arad agglomeration, the challenge is managing the transition toward a more knowledge and skills intensive basis for competitiveness.

3. A Territorial Development Model

What explains the vast differences in outcomes across a relatively small geographical space in the West Region? In this section of the report we present a basic territorial development model, which we then use in the remainder of the report to explore how location shapes economic performance in the region. The model aims to bring together the two most influential approaches to territorial development in recent years, which can be described simply as the 'people based' and the 'place based' models.

The 'people based 'or 'place neutral' model, is most commonly associated with the World Bank's World Development Report 2009 (World Bank, 2009). This report, which brought the issue of economic geography strongly to the fore of the mainstream development agenda, emphasizes how processes of unevenness, spillovers, and circular causation (or, reinforced path dependence) contribute to agglomeration and shape economic integration and growth. In particular, the report highlights unequivocally that uneven patterns of economic activity and divergence in outcomes across regions is a natural consequence of processes of agglomeration: "Economic growth is seldom balanced. Efforts to spread it prematurely will jeopardize progress. Two centuries of economic development show that spatial disparities in income and production are inevitable. A generation of economic research confirms this" (World Bank, 2009: 5–6). Thus, it argues that taking advantage of market forces like agglomeration is critical to achieving productivity gains, and therefore regional policy should focus most importantly on factor mobility, allowing people to take advantage of opportunities wherever they may be.

The 'place based' model (c.f. OECD, 2006; Barca, 2009) has been particularly influential in shaping EU policy. It argues by contrast that place matters for a variety of reasons, most importantly because endowments and geography shape the development of regional institutions, which in turn shapes territorial development paths. Getting institutions right is therefore critical, but it argues that this can only be achieved through taking into account the specific context of individual regions, and not by adopting 'spatially blind' institutions. Therefore, the 'place based' approach suggests that regional policy should focus on helping places to take advantage of their distinctive assets and characteristics.

In practice, these apparently conflicting approaches recognize their mutual relevance. The 'people based' approach does not exclude the importance of levaraging location-specific sources of comparative advantage, nor does it suggest that market forces of agglomeration and mobility trumps important cultural and other forces that tie people to places. Similarly, 'place based' models also recognize the power of market forces in shaping development prospects, and the importance of facilitating connectivity and mobility of peripheral regions.

The model we use in this report combines the two approaches. We start by using the WDR model of density, distance, and division (see Box 2) to explore how the spatial disparities discussed in the previous section have emerged and reproduce. Following this, we consider briefly how endowments and institutions in the region are likely to shape the potential responses to these challenges.

Box 2. Density, Distance, and Division

Density is the most important dimension locally. Distances are short, and cultural and political divisions are few and shallow. The policy challenge is getting density right by harnessing market forces to encourage concentration and promote convergence in living standards between villages and towns and cities. But distance can also be important because rapid urbanization leads to congestion, and divisions within cities can be manifest in slums and ghettos.

Distance to density is the most important dimension at the national geographic scale. Distance between areas where economic activity is concentrated and areas that lag is the main dimension. The policy challenge is helping firms and workers reduce their distance from density. The main mechanisms are the mobility of labor and the reduction of transport costs through infrastructure investments. Divisions within countries—differences in language, currency, and culture—tend to be small, though large countries such as India and Nigeria may be geographically divided because of religion, ethnicity, or language.

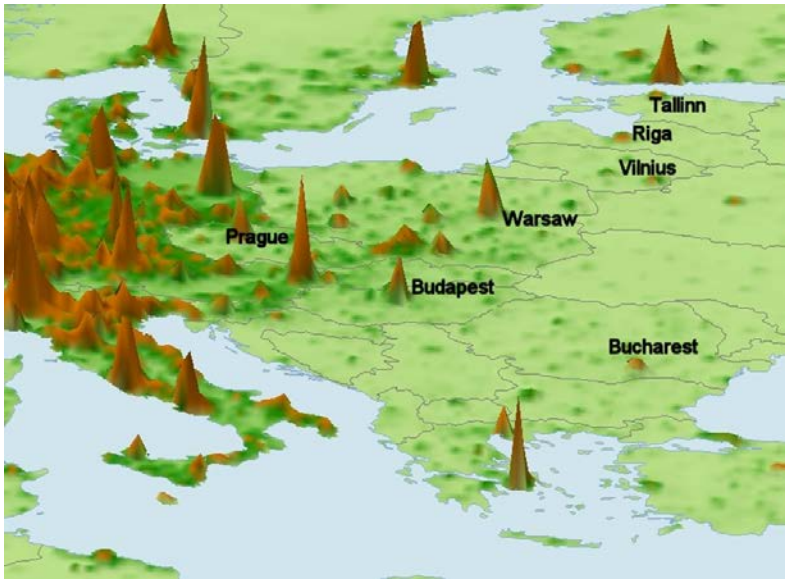
Division is the most important dimension internationally. But distance and density are also relevant. Economic production is concentrated in a few world regions—North America, Northeast Asia, and Western Europe—that are also the most integrated. Other regions, by contrast, are divided. Distance matters at the international level, but for access to world markets, divisions associated with the impermeability of borders and differences in currencies and regulations are a more serious barrier than distance. Having a large and dynamic economy within the neighborhood can help smaller countries, especially in regions distant from world markets.

Source: World Bank, 2009: 6–7.

4. Density: Scale and Agglomeration

Density normally refers to the spatial concentration of the population – that is, how many people reside within a defined unit of land area. It can also be considered from the perspective of economic output. This concept of 'economic density' takes into output the economic output produced within a defined unit of land (World Bank, 2009). In practice, the two are closely related worldwide, with urban areas concentrating the largest economic output. This is because areas where people are concentrated are attractive to firms, as they offer them larger markets, enabling them to reap scale economies. This in turn attracts more workers (who are also consumers) and suppliers. The "home market effect" (Krugman, 1980) kicks off a process of cumulative causation, concentrating more and more of the economy in urban agglomerations. Rising costs and wages act as counterbalancing forces, but most research suggests the benefits of proximity and access (to markets, workers, and supplies) tends to offset dispersion forces. Thus, the trend worldwide is strongly toward increasing concentration of economic output in urban areas.

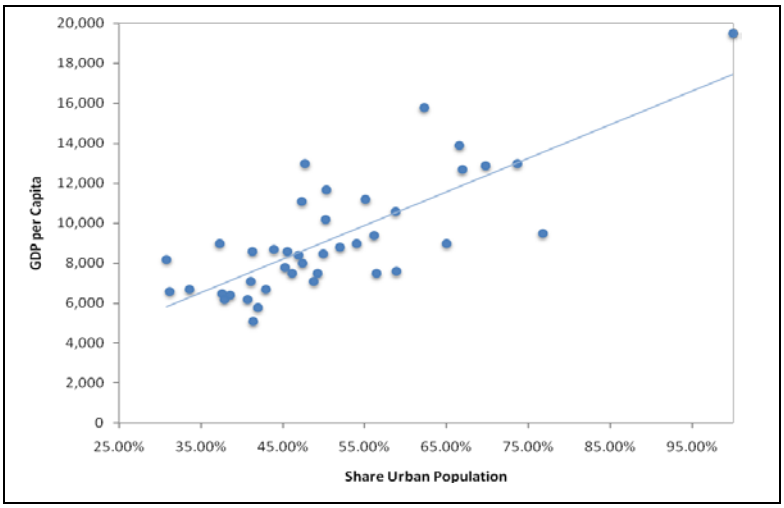
Figure 12. Agglomeration in Europe - A View from the East



Source: World Bank, 2009
Note: Relative levels of economic output are shown through height ("hills" and "mountains" in the map)

Thus, development will be uneven across space, with economic output concentrated in the densest areas. This pattern holds true for Romania as a whole. As Figure 13 shows, not only aggregate output but even per capita GDP is strongly correlated with urbanization rates across Romanian counties.

Figure 13. The Relationship between Urbanization and Economic Output Across Romanian Counties



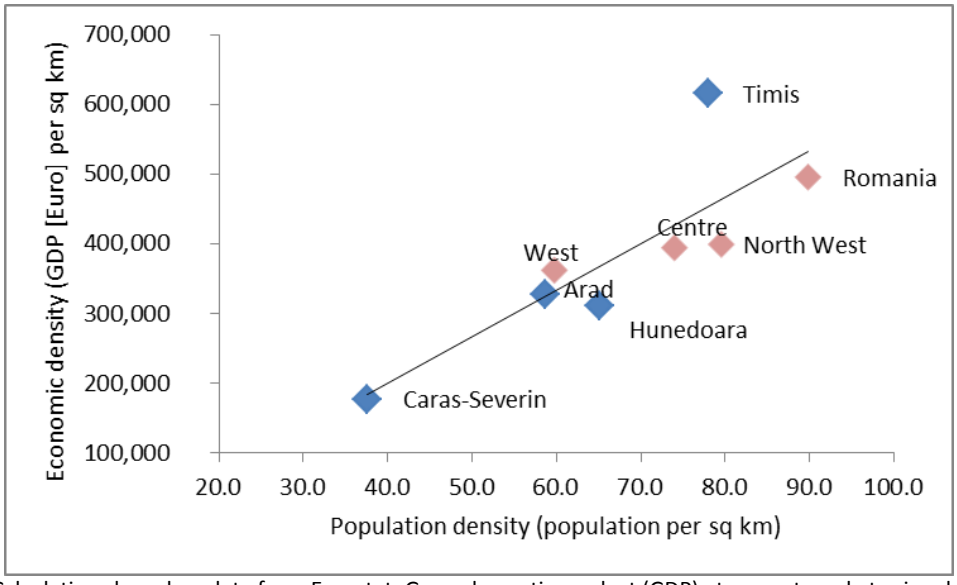
Source: World Bank, 2012

4.1. Demographic and Economic Density in the West Region

What does this mean for the territorial development patterns in the West Region? In the European context, the West Region is a low density location, both in terms of population and economic output. From a demographic perspective it is by far the least densely populated region in Romania. Within the region, density varies enormously. Timis County is denser than the national average and its economic density is far above the regression line in Figure 14, indicating it significantly outperforms expectations based on its current level of population density. At the other end of the spectrum is Caras-Severin, with extremely low density. Hunedoara and Arad are also low density in national terms.

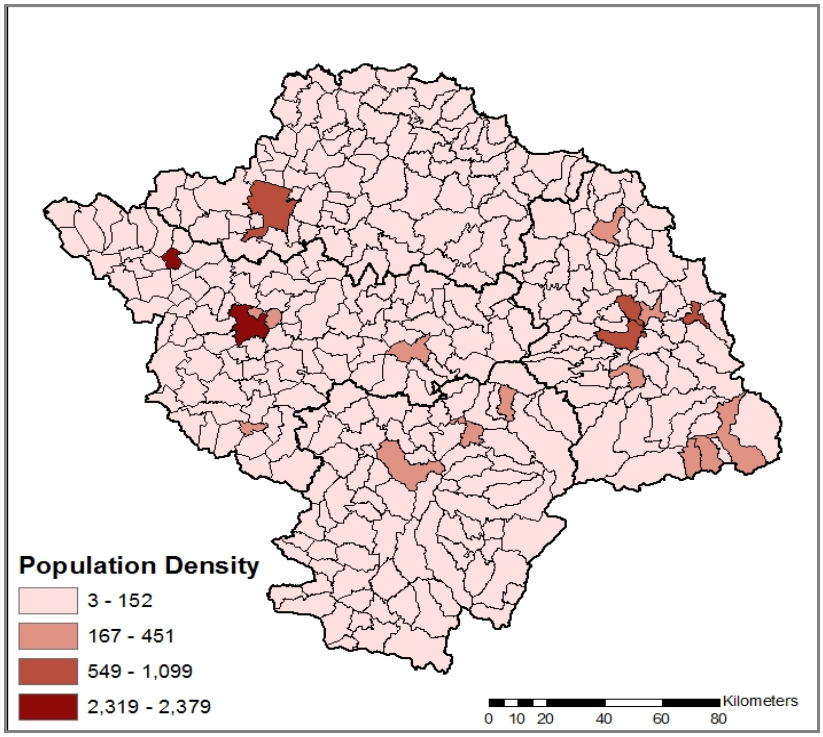
On the other hand, the West is also among the most urban regions in Romania. What this means is that there are large parts of the region with very few people, while the population is concentrated in a small set of towns and cities (Figure 15). While it is clear that the population of the region concentrates in Timișoara and around the city of Arad, it is also notable that there are a number of sizeable towns in the lagging counties, particularly throughout Hunedoara. This is potentially important as it may indicate prospects for the county to provide a sufficient labor base to support large scale investments in automotive and other manufacturing activities.

Figure 14. Population and Economic Density in Perspective - West Region Counties



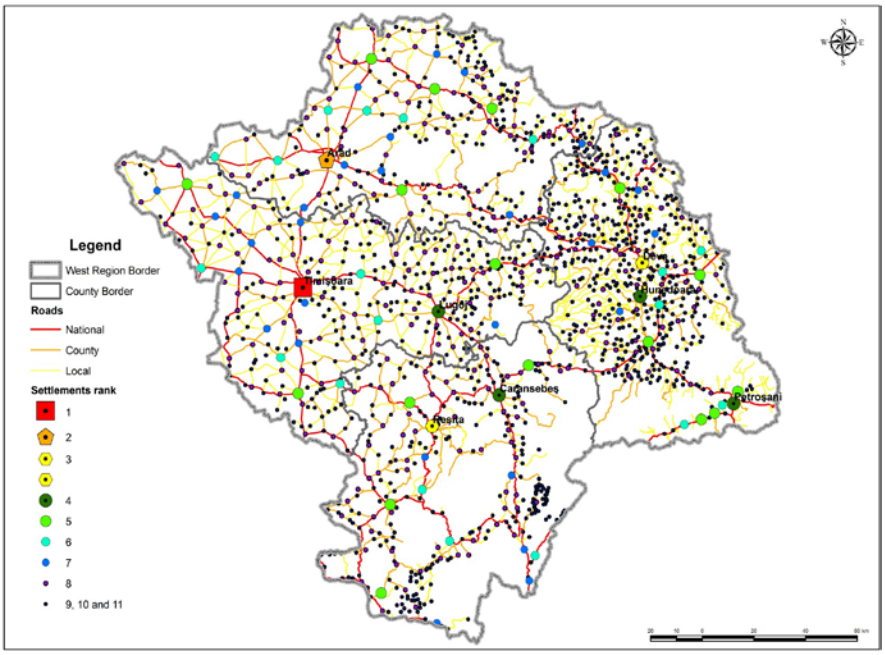
Source: Calculations based on data from Eurostat: Gross domestic product (GDP) at current market prices by NUTS 3 regions [nama_r_e3gdp]; Population on 1 January by sex, age groups and NUTS 3 regions [demo_r_pjanaggr3]; Population density by NUTS 3 regions [demo_r_d3dens]

Figure 15. Population Density by Locality in West



Source: Institute of National Statistics; Map copyright ADR West

Figure 16: Region Population Centers by Settlement Rank in West Region



Source: Calculations based on Rusu, 2007

Box 3. Ranking Settlements in the West Region

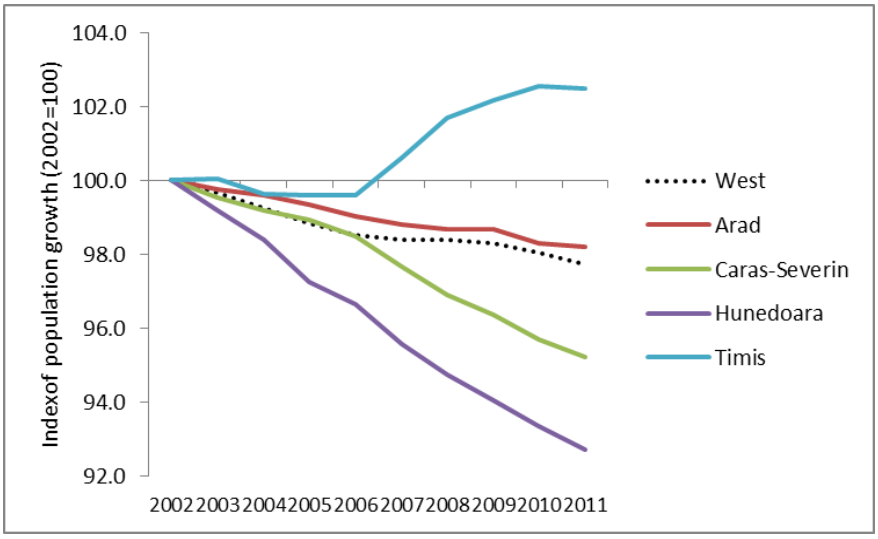
The table below provides a ranking of settlements in the West Region based on population and role, and provides examples of similarly ranked towns and cities outside of the West Region in order to put the ranking it context. This hierarchy is from Rusu (2007), which classified the settlements into 12 ranks or levels, starting from the national capital, Bucharest (rank 0) down to the most underdeveloped villages or hamlets, with almost no inhabitants and no elementary services (rank 11). Here we focus only on settlements in the West Region with rank 1 through 8.

Rank	Short description	Cities, towns, and commune centers in the West region	Cities and towns outside the West region
0	National capital city		Bucharest
1	Regional center	Timişoara	Cluj-Napoca, Craiova
2	Sub-regional center	Arad	Oradea, Sibiu
3	County seat	Reşiţa, Deva	Alba Iulia, Drobeta T. Severin, Târgu Jiu
4	Important	Lugoj, Caransebeş,	

	middle-sized city	Hunedoara, Petroșani	
5	Small city or town with large area of influence	Lipova, Ineu, Sebiș, Chișineu Criș, Sânnicolau Mare, Deta, Făget, Oravița, Moldova Nouă, Bocșa, Oțelu Roșu, Brad, Orăștie, Lupeni, Vulcan, Petrila, Hațeg	Salonta, Ștei, Câmpeni, Cugir, Orșova
6	Small town with minor area of influence or urban-like commune center	Pecica, Nădlac, Sântana, Curtici, Pâncota, Gurahonț, Recaș, Gătaia, Ciacova, Jimbolia, Buziaș, Băile Herculane, Bozovici, Anina, Călan, Simeria, Uricani, Aninoasa, Geoagiu	Vașcău, Abrud, Zlatna, Bumbești-Jiu, Baia de Aramă
7	High-grade commune center	Vinga, Vladimirescu, Șiria, Săvârșin, Beliu, Cermei, Ghioroc, Șimand, Vârfurile, Hălmagiu, Biled, Orțișoara, Giroc, Jebel, Cărpiniș, Lovrin, Nădrag, Peciu Nou, Periam, Dudeștii Vechi, Mehadia, Berzasca, Topleț, Carașova, Teregova, Crișcior, Ilia, Certeju de Sus, Ghelari, Baia de Criș	
8	Commune center	All the other commune centers	

Demographic trends may contribute to further de-densification in the lagging parts of the West Region. highlights again how different the situation is in Timis compared with the rest of the region, and provides clear evidence of the trend toward agglomeration (of population) in the region. While the West is appears to be experiencing demographic decline, in reality Timis County has grown at a pace on par with Bucharest (and had even higher in-migration over the decade), while the populations of Hunedoara and Caraș-Severin have been in severe decline.

Figure 17. Population Growth Trends in West Region Counties (Index 2002=100)



Source: Calculations based on data from Eurostat: Population on 1 January by sex, age groups and NUTS 3 regions [demo_r_pjanaggr3]

4.2. Density and Firm Location Patterns

The concentration in population across the West Region is reproduced and accentuated in the distribution of firms. Figure 18 underscores the increasing importance of the regional core – Timișoara and Arad – as focus moves to the larger and more competitive activities, including manufacturing (overall) and especially the large and foreign-owned firms which drive growth in the West Region.

This concentration of firms highlights an important factor in the territorial development of West Region – the urban-rural split. Localities classified as 'urban' account for 63 percent of the population (77 percent of total population is classified as 'urban') [6] but for 90 percent of employment and value added. Urban localities support 2.6 times more businesses on a per capita basis than rural localities, four times as many large firms, and twice as many foreign-owned firms. Interestingly, however, the urban-rural split varies considerably within counties (Figure 19).

Most notable in this regard are Arad and Caras-Severin. In Arad, the split is dramatic – its urban localities have the highest concentration of firms in the region, but its rural regions support 4.3 times fewer firms per capita. This contributes to the greatest imbalance in rural-urban contribution in the West Region, with only 5 percent of Arad County's value added

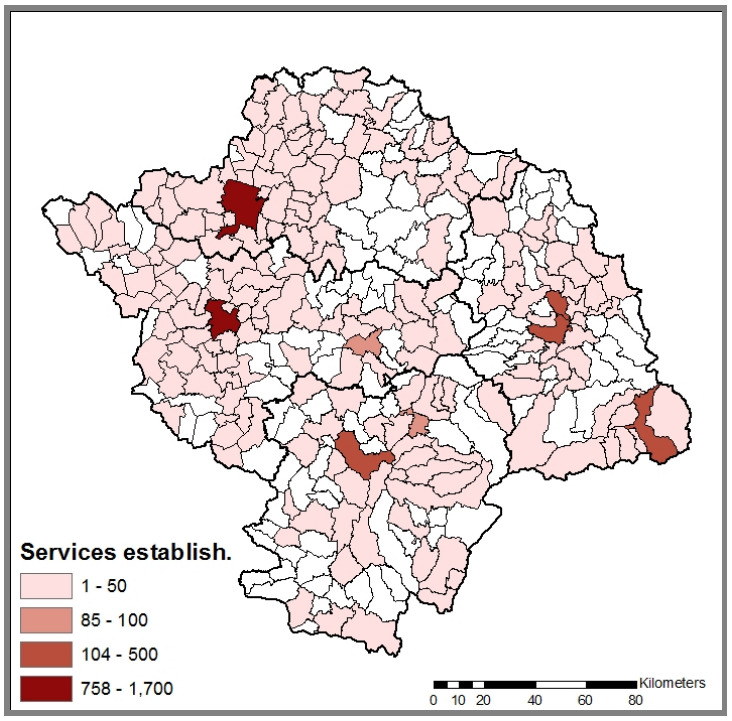
[6] Note that according to INS data, 77 percent of the population of the West Region is classified as urban. The figure 63 percent is based on an assessment of populations by classifying siruta as being either 'urban' or 'rural'. This classification was based on information provided by INS, in which siruta labeled as 'Municipal' or 'Oras' were classified as urban while the remaining were classified as rural. References to value added and firms per capita in urban and rural areas is based on this classification.

deriving from rural localities. This disparity is particularly important because Arad County has the highest share of its population residing in rural localities.

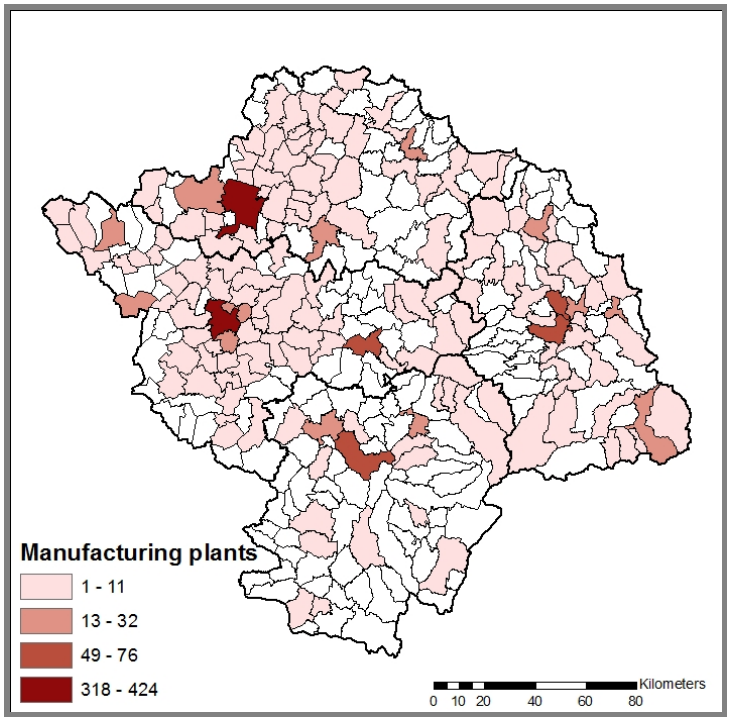
In Caras-Severin, both rural and urban localities have extremely low rates of firm formation. To put it into perspective, rural localities in Timis support more than twice as many firms per capita than in urban Caras-Severin.

Figure 18. Distribution of Firms in West Region Localities (Number of firms)

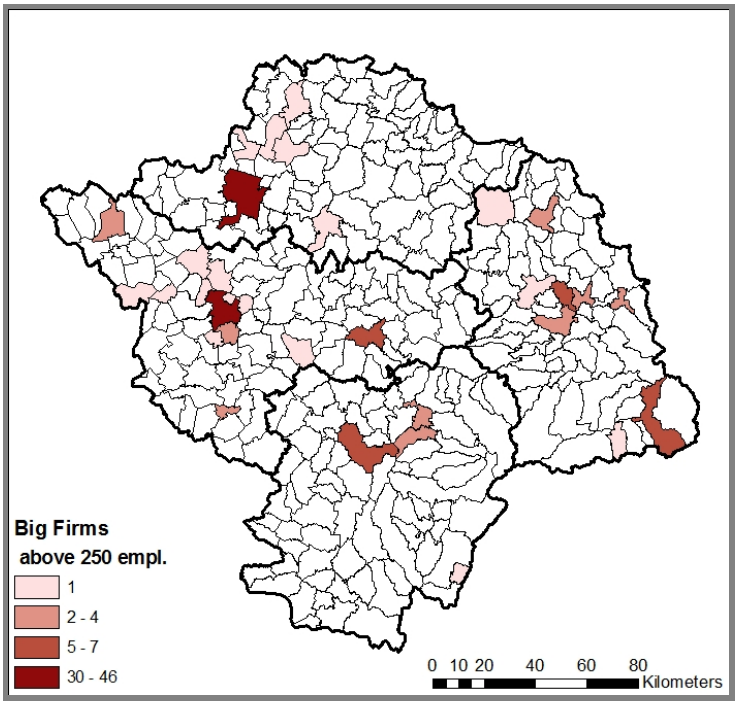
Services



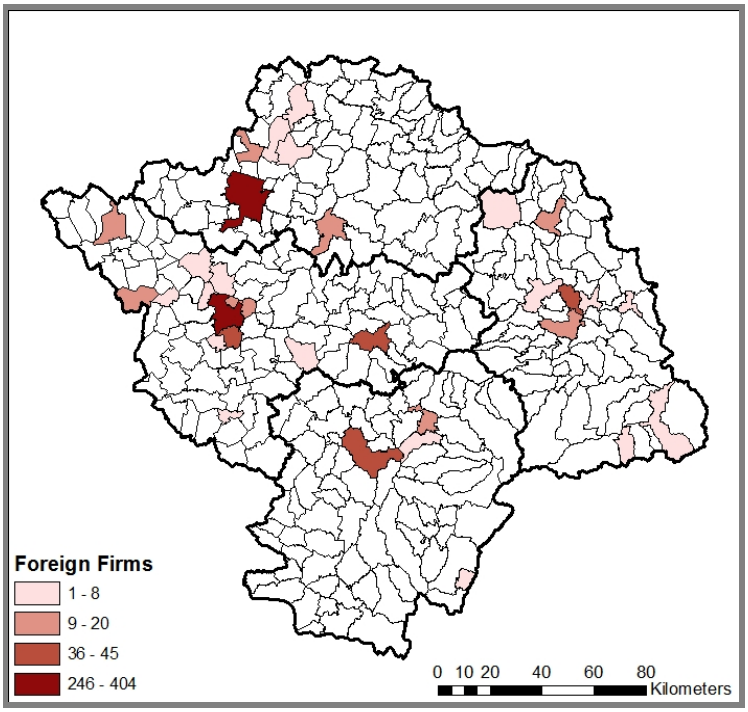
Manufacturing



Large firms

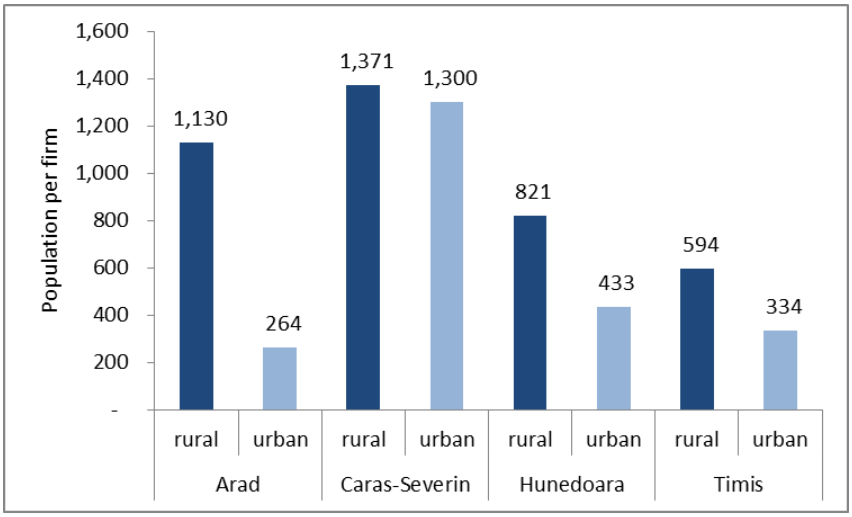


Foreign firms



Source: Business Registry; Maps copyright ADR West

Figure 19. The Urban-Rural Split in Business Formation across West Region Counties (2010)



Source: Calculations based on data from Business Registry and Institute of National Statistics (Population by Locality; classification of localities)

4.3. Industry Clusters

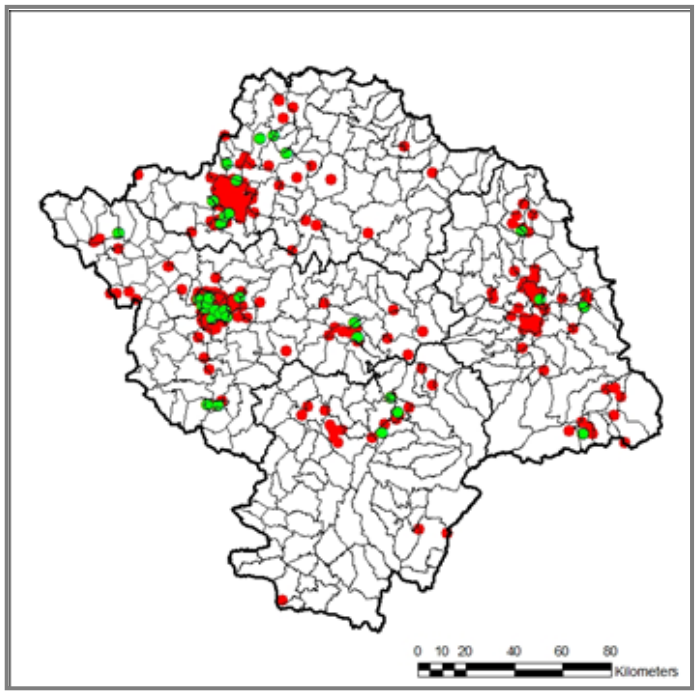
While the industry agnostic forces of agglomeration contribute to an urbanization of economic activity, a second effect contributes to the geographical concentration of firms in

related industries, whether or not in urban areas. Often referred to as localization (or Marshallian) economies, this process of agglomeration results from the benefits that accrue from access to deep local pools of specialized suppliers and labor, and from the knowledge and technology that spills over across firms and workers. The result is observed in 'clusters' of related and supporting firms. While such clusters may operate across a geographic space as wide as or wider than the Romanian development region, in some cases we observe spatial clusters within the West Region.

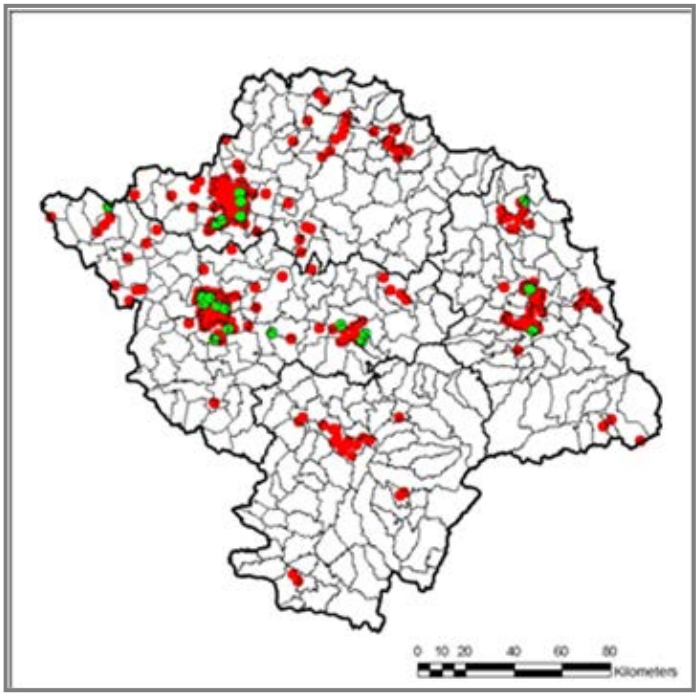
Figure 20 highlights the spatial clustering of key sectors in the West Region. Unsurprisingly, Timișoara and Arad represent the main concentrations of employment in all clusters, whether manufacturing (automotive, textiles), high technology services (ICT), or natural resources based (agri-food). But the beyond this, some differences emerge. In the automotive and textiles sectors, the cluster concentrates around both Timișoara and Arad and, perhaps most strongly north of Arad toward the Hungarian border. But secondary concentrations also exist around Deva and Lugoj, and less so around Resita and Brad. In ICT, by contrast, the cluster is almost wholly concentrated in the core cities. Agri-food also has a cluster around Timișoara but is, not surprisingly, more spread around the region, with a small concentration around Resita.

Figure 20. Clustering in West Region Strategic Sectors

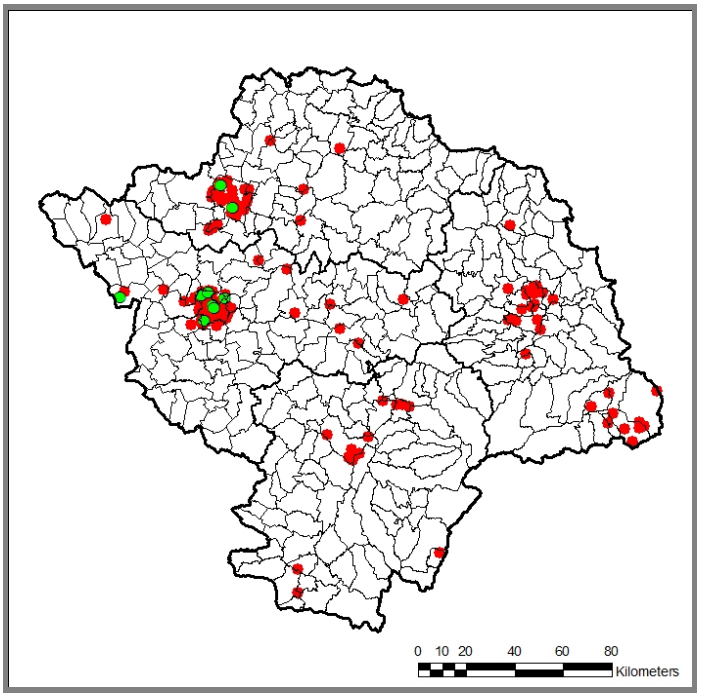
Automotive



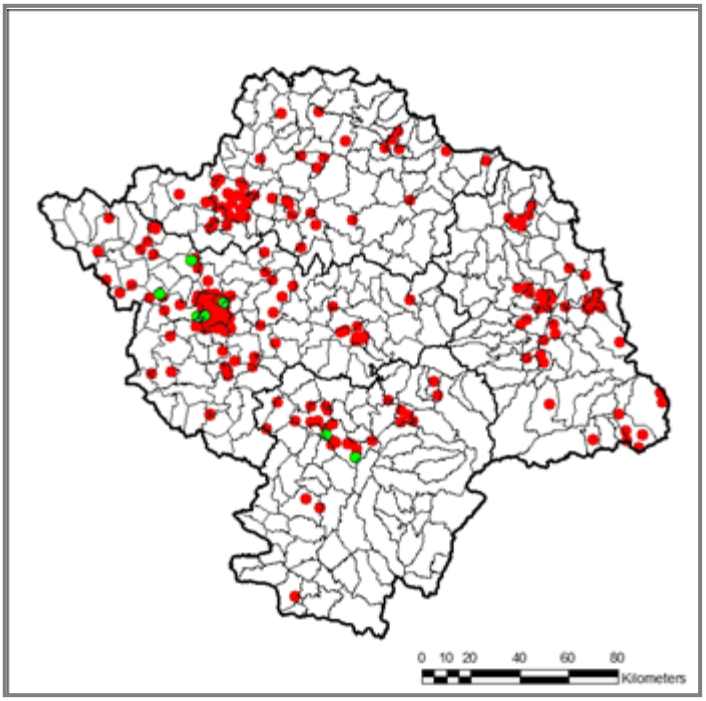
Textiles



ICT



Agri-food



Source: Business Registry; Maps copyright ADR West

Note: Each dot represents a firm; green dots indicate large firms (>250 employees)

5. Distance: Connectivity and Market Access[7]

In the context of the agglomeration forces discussed in the previous section, addressing territorial disparities by simply trying to bring jobs to people is likely to run into significant limitations[8]. Instead, it is critical to also promote mobility, to enable people to access job opportunities wherever they may be in the region (or beyond). Thus, a second critical component of a territorial development strategy is access, or connectivity. The degree to which people and firms in one location can access the important regional and national agglomerations will have a significant impact on its development prospects. This is because the greater access people and firms have to these agglomerations, the more productive they will be (through exploiting scale economies and spillovers).

Access and connectivity is a function of distance, which, under the model outlined in the World Development Report 2009 (World Bank, 2009) refers to the ease or difficulty of transporting people, goods, services, capital, information, and ideas over space. Distance and connectivity determines the degree of access to economic opportunities through processes of:

i) *migration*, which includes both temporary and permanent relocation to access employment opportunities; and,
ii) *commuting*, which is the daily process by which workers may access employment opportunities in more favorable locations.

In fact, distance and connectivity also determines the degree to which it may be possible that jobs move to people rather than the other way around. Under the models of new economic geography, transport cost (and time) plays an important role in determining the degree to which economic activity will concentrate or disperse. A significant improvement in a region's connectivity may shift the balance in a specific sector toward deconcentration, as benefits of accessing lower cost inputs may outweigh the higher transport costs and loss of other agglomeration benefits.

In this section of the report, we explore the level of connectivity in the West Region, and how this shapes the patterns of leading and lagging areas in the region. Following an initial

[7] The analysis of connectivity presented in this and the next section was prepared by a team consisting of Titus Man, Ciprian Moldovan, and Raularian Rusu from the Department of Regional Geography and Territorial Planning at the University of Cluj-Napoca.

[8] Territorial development strategies have a long history in attempting to "bring jobs to people" in underdeveloped regions, chiefly through policies designed to create incentives for investment in lagging areas. However, in many cases the policy choices, or their implementation, have resulted in inefficient or even perverse development outcomes at the subnational level. Examples include Italy's infrastructure and industrial policy in the Mezzogiorno, India's notorious "licensing Raj", tax holidays in Thailand, and targeted interest rate subsidies in Brazil (World Bank, 2009). For truly remote and sparsely populated regions, spatially targeted growth policies have for the most part been expensive failures, subsidizing inefficient investment, aggravating the leakage of the best firms and most talented workers, and contributing to unfavorable institutional environment. While these experiences should certainly not preclude the role of policy in facilitating investment in lagging regions, clearly it such an approach should not constitute the sole or main approach to addressing spatial inequalities.

discussion of the overall level of connectivity of different parts of the region in the national context, we will focus on connectivity within the region – principally the connection with the main regional agglomeration of Timișoara-Arad. In this regard, we look at how the current transport infrastructure facilitates access to the conurbation for commuters, as well as more widely how accessible is the conurbation for establishing workable, integrated markets, for firms, workers, and consumers throughout the region.

5.1. Overall Connectivity

The lines of communication and transport create large and complex networks that play a critical role in structuring the geographical space of a territory. Settlements located along the most important of these lines have obvious benefits and, in many cases, their social and economic development is strongly connected to their access to a main line of communication and transport. Eventually, many of these settlements reach the status of 'central place' (Christaller, 1933) due to the functions generated by historical and geographical factors. One of such factors is often the location on a main transport axis or, even better, at the intersection of such axes. On the contrary, the settlements located at distance from these 'power lines' are disadvantaged and the larger the distance, the higher their isolation. Connectivity may therefore be defined as the degree in which a settlement is connected to the transport network.

However, accessibility to the main transport links is just one aspect to be taken into account. In fact, the role of the communication lines is to give access to higher-grade central places, like towns or cities, which provide goods or services that one cannot find at home. Centrality is therefore crucial for the understanding of accessibility. Centers, ranked according to certain criteria, are usually convergent nodes in the transport network, as most settlements around them organize their transport infrastructure in such a way as to reach the centers in the minimum time possible. Accessibility is then the degree in which one can get to a certain place in space, central places or border crossing points in the case of this analysis.

The approach would be then to consider the position of specific groups of people in specific locations (either rural or urban communities) and postulate the means by which they might access a set of services or facilities deemed socially necessary. The welfare of the communities depends to a large extent on standards of connectivity and accessibility to such services or facilities. The most valid measure would be the assessment of the space (distance) and time budgets needed for the population of every settlement to reach specific destinations (Nutley, 1980). Based on this conception of centrality and connectivity, in this section we assess the accessibility and connectivity (or isolation) of the settlements in the West Region in relation to 'central places' (cities, towns, commune centers), using all the classified roads. Given the dominance of road transport, we have not included rail connectivity in this analysis.

The first step in the process is to classify all settlements in the region into ranks, based on a settlement hierarchy, as described in Box 3. From this, a Connectivity Index was developed, taking into account the relative accessibility (distance and driving time) of settlements in the region to other settlements, weighted by the settlement ranking. A summary of the methodology used for this analysis is provided in Box 4.

Box 4. Connectivity Index: Overview of Methodology

Taking into consideration all classified roads within the territory of the West Region, distances were calculated (using GIS) from each settlement to the nearest central place of every rank (except for rank 3, where distance to the county seat was considered). The values of distance were then aggregated for every settlement into a Connectivity Index using the following formula (Rusu, 2007):

$$RD = (3 - Dr0/150) + (3 - Dr1/75) + (3 - Dr2/40) + (3 - Dr3/20) + (3 - Dr4/12) + (3 - Dr5/8) + (3 - Dr6/5) + (3 - Dr7/3) + (3 - Dr8/2),$$

Where,

RD – road distance-based Connectivity Index;

Dr0 – distance from the settlement ranked 0;

Dr1 – distance from the settlement ranked 1…

Dr8 – distance from the settlement ranked 8.

The maximum value for each component of the formula is 3, at zero distance, meaning that the settlement belongs to a rank above or equal to the one considered. Therefore, the formula takes into account a highest possible value of 27 in the case of the capital city of Bucharest. All the other settlements nation-wide have smaller values of the Connectivity Index. Although most settlements have positive scores, values may be negative for each component and overall. Negative values are obtained for settlements located at more than 450 kilometers of the capital (rank 0), more than 225 km from settlements ranked 1, more than 120 km from settlements ranked 2, more than 60 km from the settlements ranked 3, more than 36 km from the settlements ranked 4, more than 24 km from the settlements ranked 5, more than 15 km from the settlements ranked 6, more than 9 kilometers from the settlements ranked 7, and more than 6 kilometers from the settlements ranked 8 (commune centers).Distances have been transformed into driving times needed for a motor vehicle to reach certain destinations and stress has been laid on isochrone maps centered on the main cities. While distances are important to assess the connectivity of a certain settlement, journey times to central places provide a better and more realistic picture on accessibility. For each type of road, we considered a certain average speed. This is however just a mere approximation, because the speed also depends on many factors – the quality of the road, the weather conditions, the density of traffic, the number of settlements and stops on the road. On the same road, the same journey might take longer at peak hours or in heavy weather.

Average speeds for motor vehicles according to the type of road

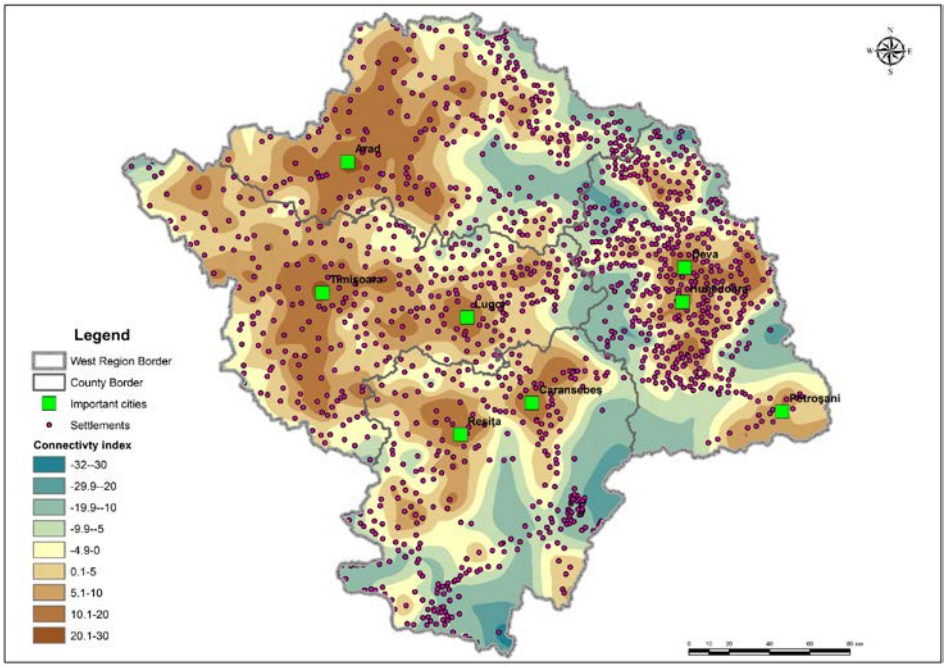
Type of road	Average speed
Motorway	110 km/h
National road	70 km/h
County road	50 km/h
Local (commune) road	30 km/h

The low speeds taken into consideration for county roads and especially for local roads are due to the fact that quite a high number of them are still unmodernized.

In some specific cases, they are not even accessible at all, except for special types of vehicles. However, we made no exceptions and included all of them in the analysis, regardless of their state, provided that important works are in progress on many such small roads.

The overall score of the Connectivity Index for the 1,405 settlements comprised in Arad, Caraș-Severin, Hunedoara, and Timiș counties varies between 23.38 (Timișoara, the best connected city and also the largest urban center) and – 31.91 (Bigăr – the most isolated village of the region). More than half of the settlements (804) have positive values of the Connectivity Index, while the other 601 have negative values and are rather isolated. However, most settlements (1,061, or more than 75 percent of the total) have rather average scores, between 10 and – 10. This provides us the opportunity to concentrate on the areas with the highest (more than 10) and lowest (below – 10) values of the Connectivity Index. Figure 21 maps the Connectivity Index across the West Region.

Figure 21. Connectivity Index of the West Region



Source: Calculations based on methodology described in Box 4

Timișoara (23.88), Arad (22.69) and Reșița (20.10) dominate the classification. Large areas with positive values of the Connectivity Index are surrounding these cities. In Arad County, the area with best connectivity lies between the city of Arad and Chișineu-Criș (to the North), Pecica (to the West), Lipova (to the East). To the South, it is connected to the area centered on Timișoara, which also extends a great deal to the East (to Lugoj and even farther) and to the South (to Deta and Gătaia). In Caraș-Severin County, large areas with high values are situated around Reșița and Caransebeș. In Hunedoara County, although maximum values are a bit lower compared to the other three counties, there is still a compact area with values above 10 along the Mureș (Orăștie) Corridor and to its South, centered on the quadrangle formed by Deva – Hunedoara – Călan – Simeria. High values are also characteristic for the northern part of Hațeg Basin, for Petroșani Basin, for the center of Brad Basin, and for towns like Sânnicolau Mare, Ineu, Sebiș, Oravița, Anina, Buziaș, Jimbolia, not too far away from the main cities.

The lowest values correspond to the least accessible areas, usually in the mountains, where road connections are weak. Therefore, the lowest score was registered for Bigăr, an isolated village in Almăj Mountains. Similarly low values are recorded for settlements in Metaliferi, Cerna, Țarcu, Șureanu, Găina and Codru Moma Mountains, as well as in Lipova Hills, eastern Zărand Mountains, Almăj Basin.

It is interesting to note that low values also characterize the settlements situated along the borders, like those along the Danube or Nera. Even lowland settlements like Iam, Lățunaș, Grănicerii, Beba Veche (the westernmost village in Romania) and their surroundings,

located near the border with Serbia, have low connectivity. This is due to the poor infrastructure close to the borders, on the one hand, and the large distances to the main cities in Romania. In these cases, the political factor (the border) acts as a restriction, not the topography, as it is the case in the mountains.

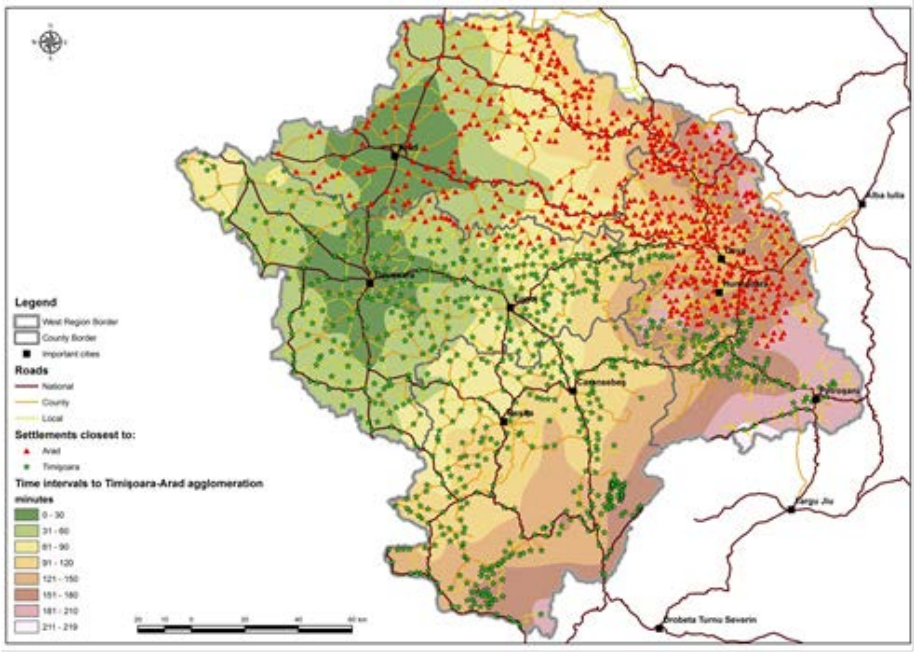
5.2. Connectivity with the Main Regional Agglomerations

One of the most important challenges in addressing territorial disparities in the West Region is to improve internal connectivity to the main agglomerations, which are the growth engines for the region. Addressing this involves looking at ways to expand the catchment areas of the urban centers to absorb a wider commuting workforce in the region, as well as improving general connectivity to allow businesses, workers, and consumers in the region to benefit from access to a larger market. Far and away the most important of agglomerations is the Timișoara-Arad conurbation. This subsection will focus primarily on connectivity to Timișoara-Arad, but will also include a discussion of other key urban centers in the region.

The isochrone map of journey times to Timișoara-Arad agglomeration (Figure 22) indicates that only the western halves of Timiș and Arad counties are within the one-hour commuting distance from Timișoara or Arad. A very large area from Zerind (in North, at the border with Bihor County) to Moravița and Jamu Mare (in South, at the border with Serbia) is within the one-hour isochrone (in green). One can get to Timișoara in less than an hour from Lugoj and from most settlements to the West of the city, except for an area around Cenad – Dudeștii Vechi – Beba Veche in the extreme North-West and an ”island” including Saravale and Igriș (which would be closer to Arad if a bridge existed over Mureș River). The one-hour isochrone extends from Arad to Bătuța (along the Mureș Corridor) and to Șicula on Crișu Alb.

However, most of the eastern part of Arad County, as well as the eastern Lipova Hills, and Făget Basin in Timiș County are more than one hour away from Timișoara–Arad agglomeration. The situation is even worse in the case of Caraș-Severin and Hunedoara counties. In Caraș-Severin, only a very small area (Măureni-Ghertenis) is within the one-hour isochrone from Timișoara . The rest of the county population needs more than that to reach Timișoara , with approximate times of one hour and a half for Reșița and Caransebeș, and more than 2 hours for the southern areas around Moldova Nouă, Bozovici or Băile Herculane. The people of Bigăr would need even more than 3 hours to get to Timișoara . The same situation is found in the case of Hunedoara County. No settlement is within the one-hour isochrone and most settlements are more than 2 hours away from Timișoara-Arad agglomeration, as it is the case for Deva. Times close or around 2 hours and a half characterize towns like Hunedoara, Brad, Orăștie or Hațeg. Areas in Metaliferi, Găina, Șureanu and Poiana Ruscă Mountains are more than 3 hours away, while Petroșani Basin is the most remote in terms of driving times.

Figure 22. Driving Times to the Timișoara-Arad Conurbation

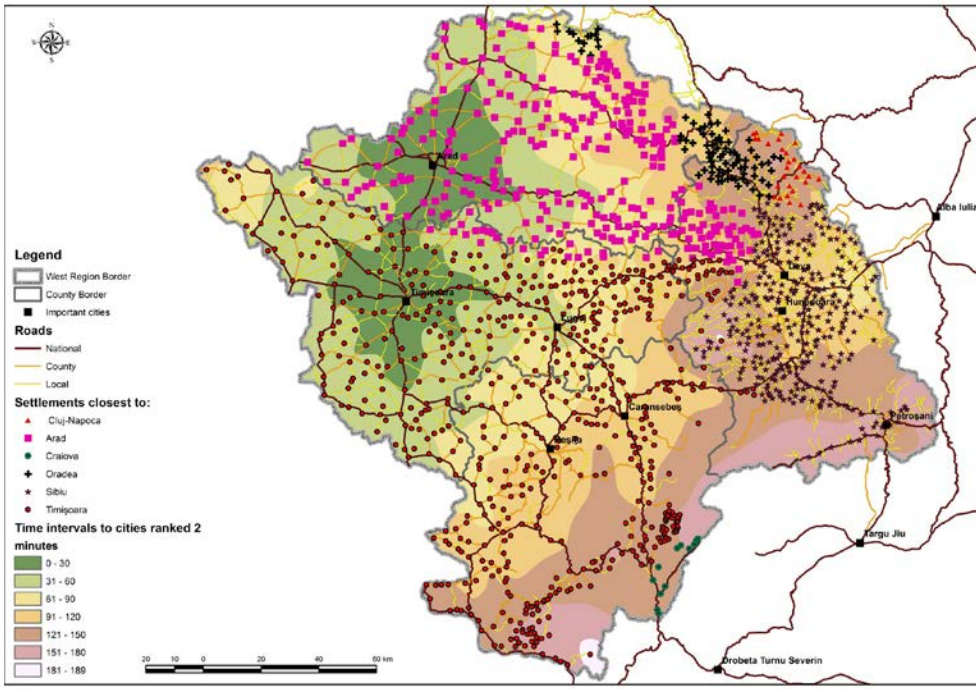


Source: Calculations based on methodology described in Box 4

In fact, for the more remote parts of the West Region – including most of Hunedoara and small parts of northern Arad and south-eastern Caraș-Severin – Timișoara and Arad are less accessible than other cities outside the region (Figure 23). Most of the central, eastern and southern Hunedoara County is closer to Sibiu, with driving times less than one and a half hours in the case of Orăștie, less than 2 hours for Deva, Hunedoara or Hațeg, and about 2 hours and a half for Petroșani Basin. In north-eastern Hunedoara County, a number of villages are closer to Cluj-Napoca, but they are more than 2 hours away from that city. Most of Brad Basin in Hunedoara County and Hălmagiu Basin in Arad County, as well as an area including Craiva commune in northern Arad County, are closer to Oradea. The time needed to get there is less than one hour and a half for Craiva commune, between one and a half and 2 hours for Hălmagiu Basin and more than 2 hours for most of Brad Basin.

For a number of settlements in south-eastern Caraș-Severin, around Mehadia and Băile Herculane, Craiova is potentially closer than Timișoara , but times needed to get there are rather similar, between 2 hours and 2 hours and a half. The most isolated areas, more than 2 hours and a half away from any important city, are those located in the southern parts of Caraș-Severin and Hunedoara County, in Almăj Mountains, Almăj Basin, Cerna Mountains, Petroșani Basin. Important areas of isolation are also to be considered those of Poiana Ruscă, Găina and Metaliferi Mountains.

Figure 23. Connectivity Considering Nearest City (Inside or Outside the West Region)



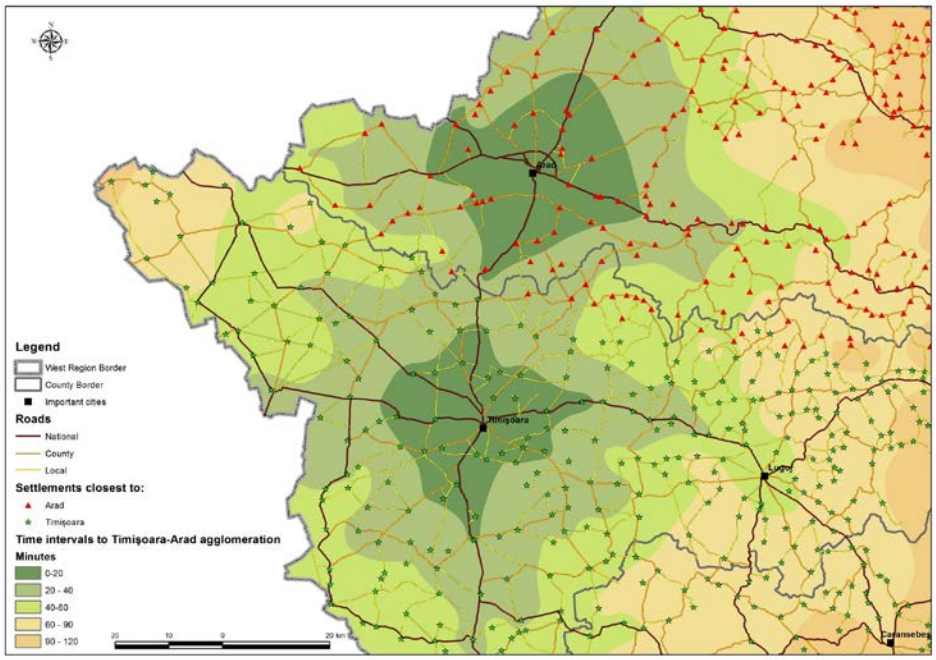
Source: Calculations based on methodology described in Box 4

Focusing on Timișoara-Arad agglomeration, the one-hour isochrone has been split into three areas: 0-20 minutes, 20-40 minutes and 40-60 minutes Figure 24). The first area, within 20 minutes travel time to either Timișoara or Arad, includes the neighbouring municipalities – Giroc, Ghiroda, Dumbrăvița, Săcălaz, Sânmihaiu Român, Sânandrei, near Timișoara , and Vladimirescu, Livada, Șofronea, Șagu, Fântânele, Zădăreni, Felnac and even Vinga near Arad. It is also true that this might be considered as the time needed to get inside the city; many times travelling through the city would be more time-consuming than reaching the city limits.

The territory located between 20 to 40 minutes away from any of the two cities is much larger and actually reaches the borders, at Turnu (Arad County) – actually about 20 minutes away – and Jimbolia (Timiș County). It extends as far North as Chișineu Criș, as far South as Deta, and covers entirely the area between Timișoara and Arad.

The one-hour isochrone includes the western half of the two counties of Timiș and Caraș-Severin almost entirely, therefore comprising the area of highest population density in the West region.

Figure 24. The Timișoara-Arad Commuter Belt (20, 40, and 60 minute distances)



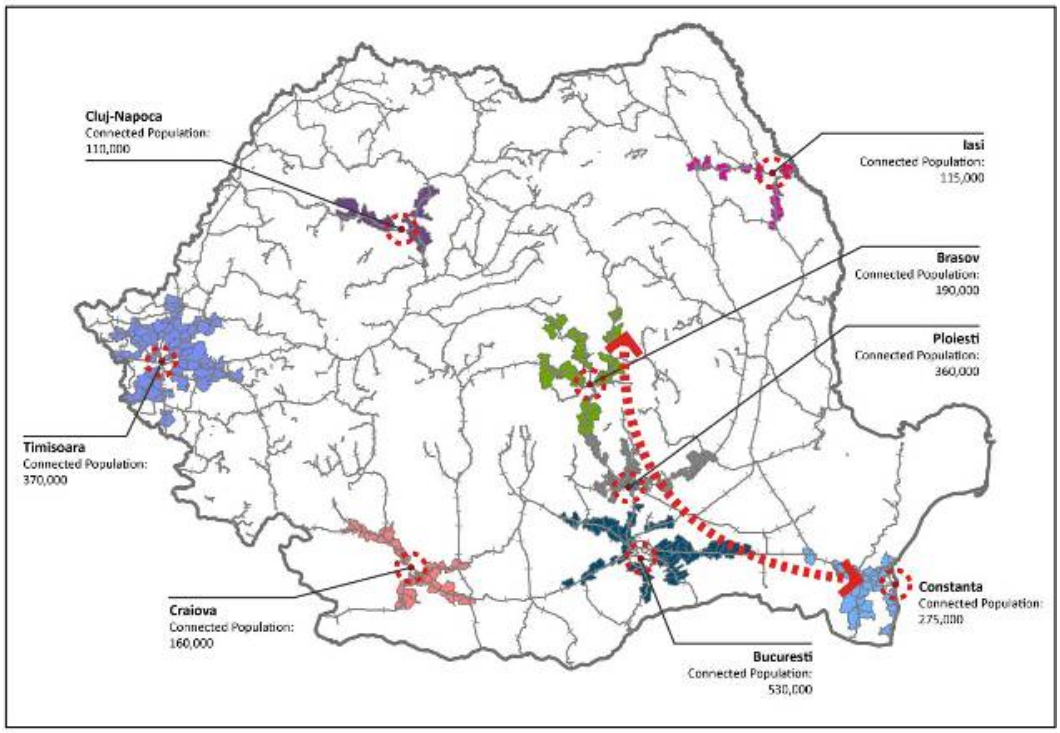
Source: Calculations based on methodology described in Box 4

When considering the catchment area of Timișoara-Arad for commuters, it is worth also taking into account the rail system. Despite the many problems with the operations of the rail network, substantial infrastructure exists, and in Timișoara-Arad, there appears to be significant potential, in terms of accessing a critical mass of riders, to enable it to operate efficiently.

Figure 25 assesses the population accessible within a one hour rail commute of main cities in Romania. It indicates that nearly 400,000 people are located within a one hour rail commute to Timișoara. This is the largest population accessibility outside of Bucharest and presents a substantial advantage over cities like Cluj, which can only connect around 100,000 people.

The rail network appears to be an unexploited source of advantage for the region, and one that could improve the competitiveness of the region's core while also helping to address territorial development challenges. The infrastructure is largely in place, what is needed is better management of the existing network in order to deliver the reliability, efficiency, and quality required to attract riders and make the system economically viable.

Figure 25. One hour rail access areas for selected cities in Romania



Source: World Bank, 2012

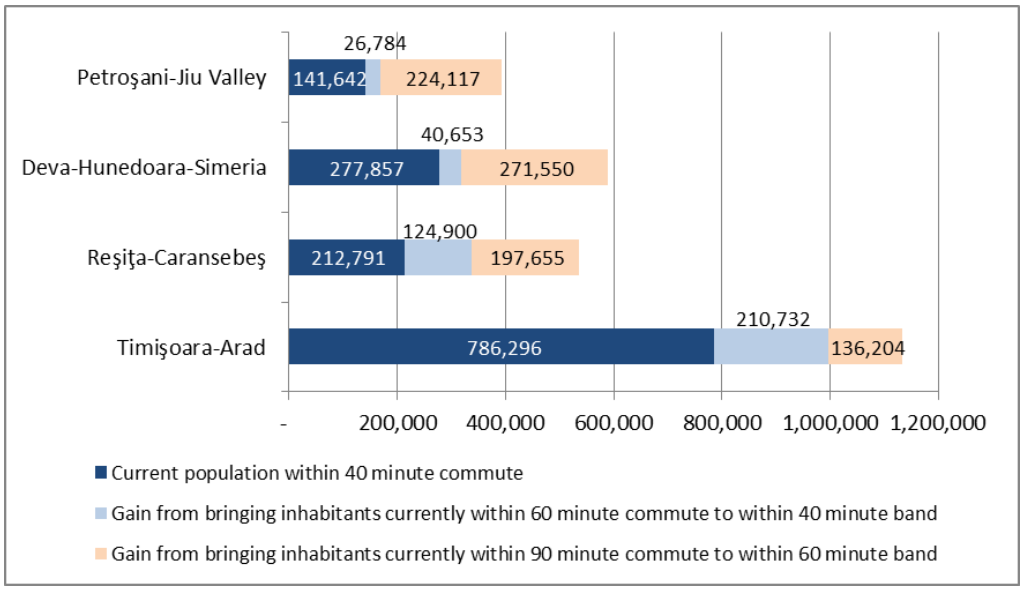
Looking beyond Timisoara-Arad, a similar analysis of connectivity to urban agglomerations has been carried out for the next three most important conurbations in the region: Resita – Caransebes; Deva – Hunedoara – Simeria; and Petrosani – Jiu Valley. Detailed results of these analyses are provided in Annex 2.

Figure 26 brings together the results of the analysis across all four main agglomerations in the region. First, it highlights the relative importance of Timisoara – Arad, which has a catchment population of close to 800,000 within a 40 minute commuter band. However, Deva – Hunedoara – Simeria also reaches nearly 300,000 people and Resita-Caransebes just over 200,000. The analysis presented in Figure 26 also attempts to give some perspective on what would be the broad impact of connectivity improvements on the commuting population in each agglomeration[9]. A few interesting findings arise from this. First, probably the biggest economic impact on the region would come from improving connectivity to Timisoara – Arad for those currently living between 40 and 60 minutes from the conurbation. However, a similar connectivity improvement would have an even greater relative impact on Resita – Caransebes (where the commuting population would expand by 59 percent versus 27 percent in Timisoara – Arad). Improvements in connectivity at that level

[9] Note that this is a theoretical analysis, without any assessment of the relative ease or difficulty of achieving the connectivity gains presented here.

would, by contrast, have a limited impact in the Hunedoara agglomerations. In these agglomerations, the gains appear to come from improving broader connectivity with the rest of the region.

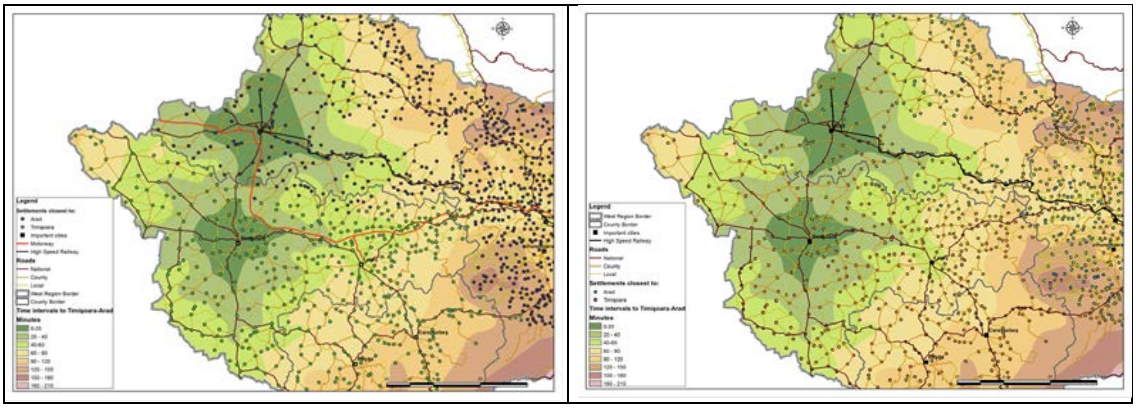
Figure 26: Potential impact of connectivity improvements on the population within commuting distance of main agglomerations in West Region



Source: Calculations based on methodology described in Box 4
Note: The second bar refers to the number of additional inhabitants that would be living within a 40 minute commute if connectivity improvements enabled those currently living between 40 and 60 minutes from the agglomeration to access the agglomeration in 40 minutes or less; the third bar refers to the number of additional inhabitants that would be living within a 60 minute commute if connectivity improvements enabled those currently living between 60 and 90 minutes from the agglomeration to access the agglomeration in 60 minutes or less.

Finally, in the context of the discussion above on the potential impacts of connectivity improvements, we assess briefly the potential that planned transport infrastructure investments may have on connectivity to the main Timisoara-Arad agglomeration. Specifically, we assess the expected impact of investments in the Corridor IV motorway network and the 22 TEN-T high speed rail line – see further discussion later in the report and methodology in Box 6. As can be seen in Figure 27, improvements in journey times to the agglomeration would be significant, as Timisoara benefits from the new road infrastructure and Arad mainly from the rail. Under this scenario, all important urban centers in the region (including Reșița, Caransebeș, Deva and Hunedoara) would come within the 90 minute commuting band of the conurbation.

Figure 27: Potential Impact of Road (LHS) and Rail (RHS) Investments on Connectivity to Timisoara-Arad



*S*ource: Calculations based on methodology described in Box 4 and Box 6Box 5

6. Division

In the model of the World Development Report 2009 (World Bank, 2009), "division" refers to the ease or difficulty with which factors of production cross borders – particularly (but not exclusively) international borders. The barriers that may block the free flow of goods, capital, people, and services come through both physical borders as well as a wide range of regulatory, institutional, and cultural factors.

In the case of the West Region, European accession and the significant integration that has resulted has been one of the most critical factors contributing to its growth performance. Some barriers remain that may block the region from fully exploiting its locational advantage in this regard. However, these are not likely to have a significant impact on the territorial development challenges that are the subject of this report.

Instead, in this section, we focus on three aspects of "division" that may impact on territorial disparities in the West Region:

i. The region's disconnection from Bucharest;
ii. The potential unexploited opportunities with Serbia; and
iii. Lagging areas and access to key border posts

6.1. Improving Connectivity to Bucharest

One of the most characteristic features of the West Region of Romania is the degree to which it associates with Western Europe rather than to the rest of Romania. This is evident in the structure of its economy, in the transport network, and in the attitudes and culture of its citizens. Firms in the region, at least in the western part of the region, export almost half of their production, suggesting that the market in Bucharest plays a relatively limited role in the strategic and investment decisions made by firms in the West Region. Migration patterns in the country also underscore this disconnect – according to statistics on internal migration from Eurostat, just 6 percent of the West Region's internal emigrants are in Bucharest (versus 22 percent of internal migrants nationally that are in Bucharest); similarly just 3.5 percent of Bucharest's emigrants are in the West Region[10].

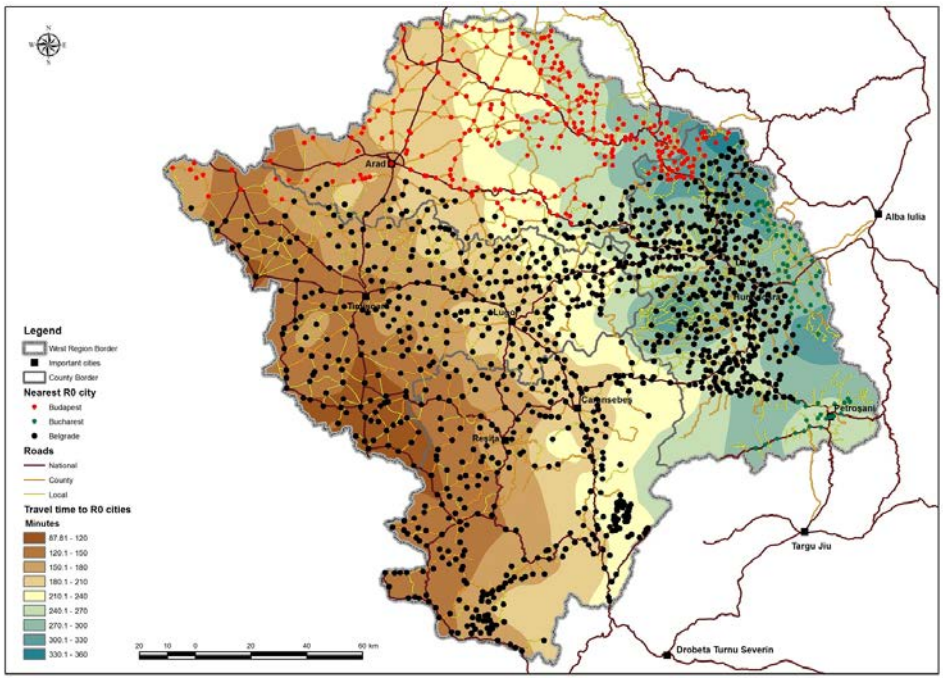
In terms of physical connectivity, Figure 28 highlights just how much closer the rest of Europe is to the region compared to Bucharest. Despite the fact that connections to Hungary and Serbia are restricted because of the limited number of border crossing points, virtually all settlements of the West Region are better connected by road to either Belgrade or Budapest than to Bucharest. Although Belgrade is closer in terms of distance to most settlements of the West Region, better road infrastructure in Hungary – the presence of the motorway from Budapest to Szeged and Makó – determines that almost all settlements in Arad County and a few in Brad Basin are closest to Budapest, while most of the rest of the region is closest to Belgrade.

[10] Based on annual internal migrants over the period 2000 to 2007

In fact, the only areas of the West Region are better connected to Bucharest than to capital cities elsewhere in Europe are the settlements of the Petroșani Basin and the Orăștie Corridor. But even here, travel time to the capital is in the range of 4 to 4.5 hours. Those parts of the West Region that are relatively isolated from Timișoara and Arad are hardly better connected to Bucharest. For example, most of Hunedoara County remains 5 to 6 hours from Bucharest, the isolated eastern parts of Arad are 6 to 7 hours away, and most of Caraș-Severin at least 6.5 hours away. This has significant implications for the possibilities of firms in these areas to access larger markets, for investors to consider locating plants, and for connecting citizens with job opportunities.

The region is of course also connected by air, with a one hour flight time to Bucharest. As of March 2013, there were four scheduled, direct flights to Bucharest from the airport in Timisoara on Mondays through Fridays, with three on Saturday and Sundays.

Figure 28. West Region Connectivity in the European Context



Source: Calculations based on methodology described in Box 4

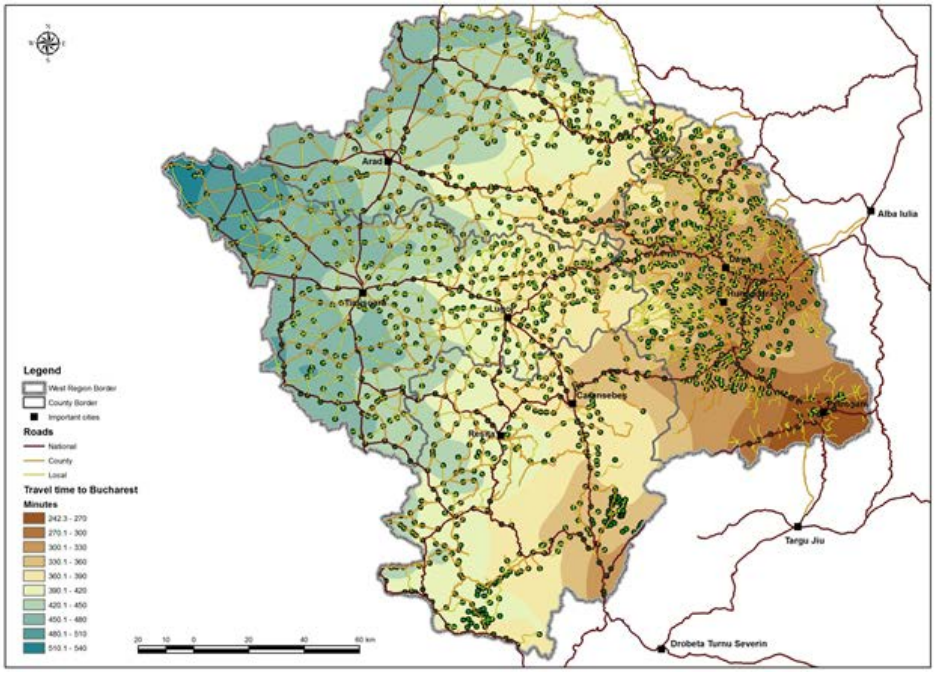
Box 5. Connectivity to Budapest and Belgrade from around the West Region

The shortest amount of time needed to get to Belgrade is about 1.5 hours, from the border village of Moravița. One needs less than 2 hours to reach the same city from south-western Timiș County or from Jimbolia. The largest part of western Timiș and Caraș-Severin counties are between 2 and 3 hours away from Belgrade, including Timișoara and Reșița. The eastern part of these counties is between 3 and 4 hours from Belgrade.

The areas around Nădlac (Arad County) and Cenad (Timiș County) are a bit more than 2 hours away, this time from Budapest. The execution of the Hungarian motorway as far as Makó changed the regional orientation, even for north-western Timiș County. The city of Arad is now only about 3 hours from Budapest. The other settlements of western Arad County are located between 3 and 4 hours from Budapest, and those in the North and North-East at more than 4 hours from the same city.

South-East Arad County, like most Hunedoara County, is closer to Belgrade than to Budapest, even in terms of time. Journey times to Belgrade from here amounts to more than 4 hours. Deva is approximately 4.5 hours an and Brad at about 5 hours from Belgrade.

Figure 29. Travel Times from West Region to Bucharest – Current Transport Network



Source: Calculations based on methodology described in Box 4

Improving connectivity to Bucharest may also be critical to facilitate the growth and diversification of the region's exports. As Table 5 indicates, exports to non-EU destinations have been increasing in importance in recent years across all counties. What is noteworthy is

the location of these markets, and in particular the importance of markets like Turkey and Ukraine, and possibly Egypt that would most likely be accessed through Constanta port.

Table 5. Main Non-EU Export Markets by County (2005 and 2011)

		% exports	
	markets	**2005**	**2011**
Arad	Ukraine	0.1	1.6
	Switzerland	2.6	1.3
	Turkey	0.3	1.3
	top 3 subtotal	*3.0*	*4.1*
Caras-Severin	Saudi Arabia		19.8
	Turkey	0.1	2.6
	Algeria		1.5
	top 3 subtotal	*0.1*	*24.0*
Hunedoara	Turkey	5.5	4.3
	Egypt	0.1	2.3
	China	0.6	1.8
	top 3 subtotal	*6.1*	*8.4*
Timis	Turkey	0.5	2.2
	United States	1.1	0.9
	Croatia	0.2	0.6
	top 3 subtotal	*1.7*	*3.7*

Source: Calculations based on data from Institute of National Statistics (Customs transaction data)

Priority transport infrastructure projects of the national government – the Transylvania Highway and the Pan-European Corridor IV – would make significant improvements to the accessibility of the region to Bucharest. While the connections between Timișoara and Arad and their links to the Hungarian border have been completed, much of the critical work to connect the region to Bucharest continues to face significant delays.

An assessment of the potential implications on journey times to Bucharest under the scenario of the completion of the Corridor IV roadways (see Figure 30) indicates that 83 percent of settlements in the West Region would benefit from improved connectivity. The largest differences are registered in the case of settlements around Timișoara, in fact near the motorway exits at Giarmata and Orțișoara. Journey times to Bucharest would reduce by more than 100 minutes for about 20 villages in that area, with a maximum of 107 minutes for Cerneteaz and Giarmata. The inhabitants of Timișoara, would see their journey times to Bucharest reduced by approximately 84 minutes and those from Arad by about 70 minutes. In total, 274 settlements would improve their journey time to Bucharest by more than one hour, including Lugoj, Sântana, Buziaș, Pecica and other towns. For other almost 900 settlements, journey times are improved by less than an hour, such as Deva, Hunedoara (more than 30 minutes), Reșița (24 minutes), Hațeg, Oțelu Roșu or Caransebeș (a mere 8 minutes).

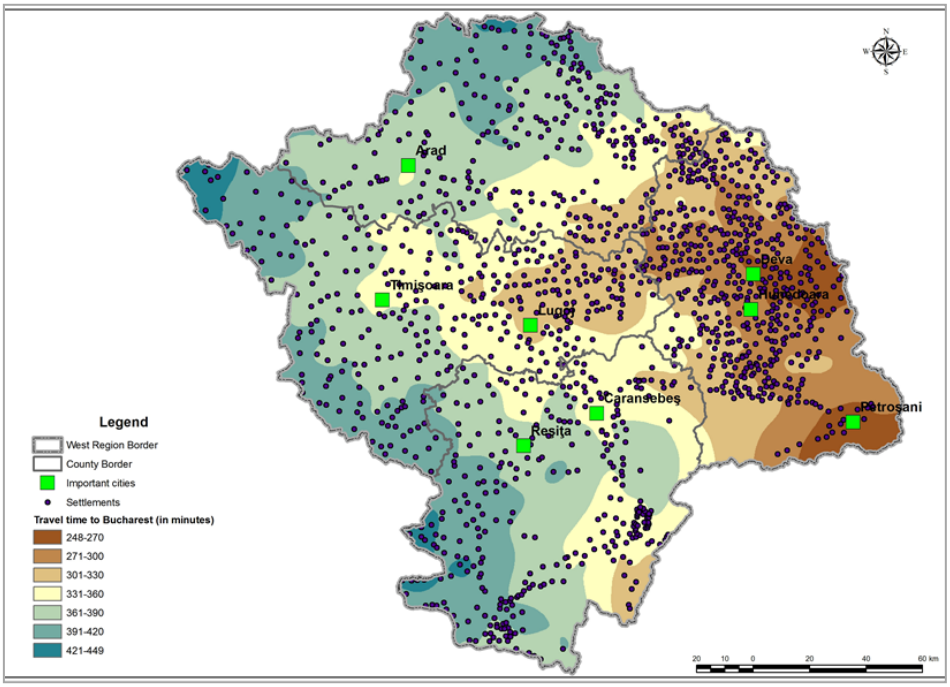
Box 6: Assessing the Connectivity Impact of Planned National Road and Rail Investments - Methodology

What would be the impact of ongoing and planned major transport infrastructure projects on connectivity of the West Region? Using the same approach to assessing connectivity described earlier in this report (see Box 4), we analyze the potential impact of two major national projects: i) part of the European IV corridor motorway running from Nădlac to Sibiu; and ii) part of the 22 TEN-T corridor high speed rail line running from Curtici through Arad and Simeria and on to Bucharest and Constanta.

To carry out the assessment, we consider the planned investments as already functional on their entire route, although sections of the routes will be opened up in different years. Nevertheless, the impact can only be fully understood if one considers the new infrastructure as complete. For the motorway, the appropriate entries and exits from Nădlac to Orăștie have been inserted as they are the points of connection to the existing road network. The last exit, outside the West Region, is (already functional) near Sibiu. We did not take into account the possible future motorway from Sibiu to Pitești, as nothing is known for the moment regarding its future route. Then, from Pitești to Bucharest, once again we took in consideration the existing motorway. The average speed on the motorway is estimated as 110 km/h.

For the high speed railway, the estimated speed of trains along this railway is considered as 120 km/h. However, only fast trains, which stop in fewer railway stations, may reach such speed, therefore we only took into consideration certain railway stations within the West Region, where trains might stop: Curtici, Arad, Radna, Săvârșin, Ilia, Deva, Simeria and Orăștie. These railway stations would be reachable from the surrounding areas by using the road network, not by other railways. A model was also built in which both the motorway and the high speed railway are considered together, as higher speeds may be reached by combining and using both new types of infrastructure.

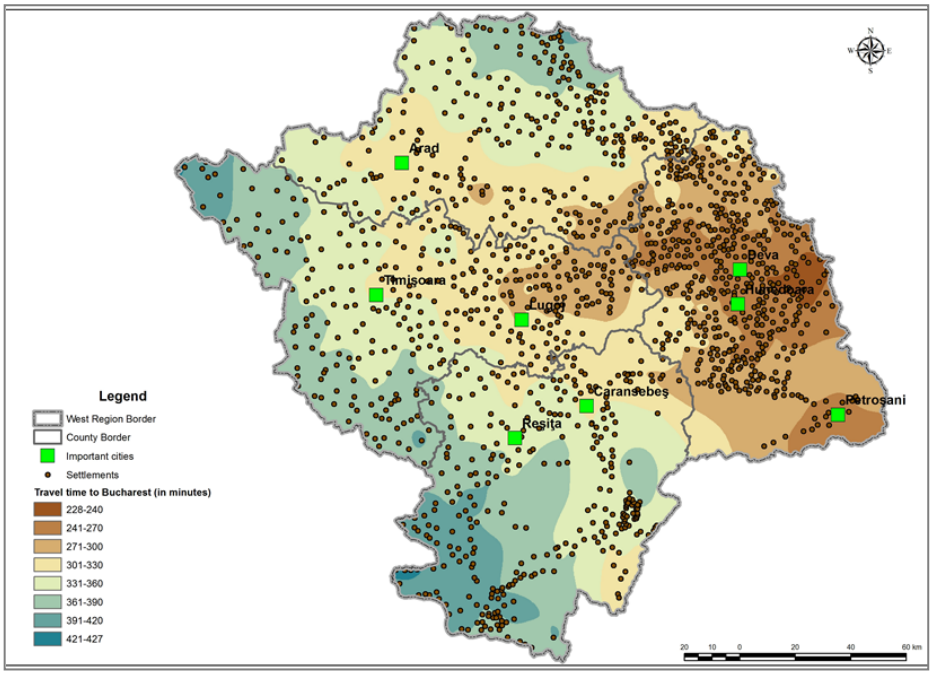
Figure 30: Estimated Journey Times to Bucharest with Completed Corridor IV Motorway



Source: Calculations based on methodology described in Box 4 and Box 6Box 5

Adding the high speed rail line into the equation improves journey times further, especially for the settlements which are located along the motorway in areas not crossed by the high speed railway or near the motorway exits (see Figure 31). The biggest beneficiaries of combined road and rail investments would be residents of Timiș and northern Caraș-Severin counties. By using both the motorway and the high speed railway, one may get to Bucharest in less than 5 hours from Lugoj and less than 5 hours and a half from Timișoara, Caransebeș and the surrounding areas. Reșița would be less than 6 hours away from Bucharest.

Figure 31: Estimated Journey Times to Bucharest with Completed Corridor IV Motorway and 22 TEN-T High Speed Rail

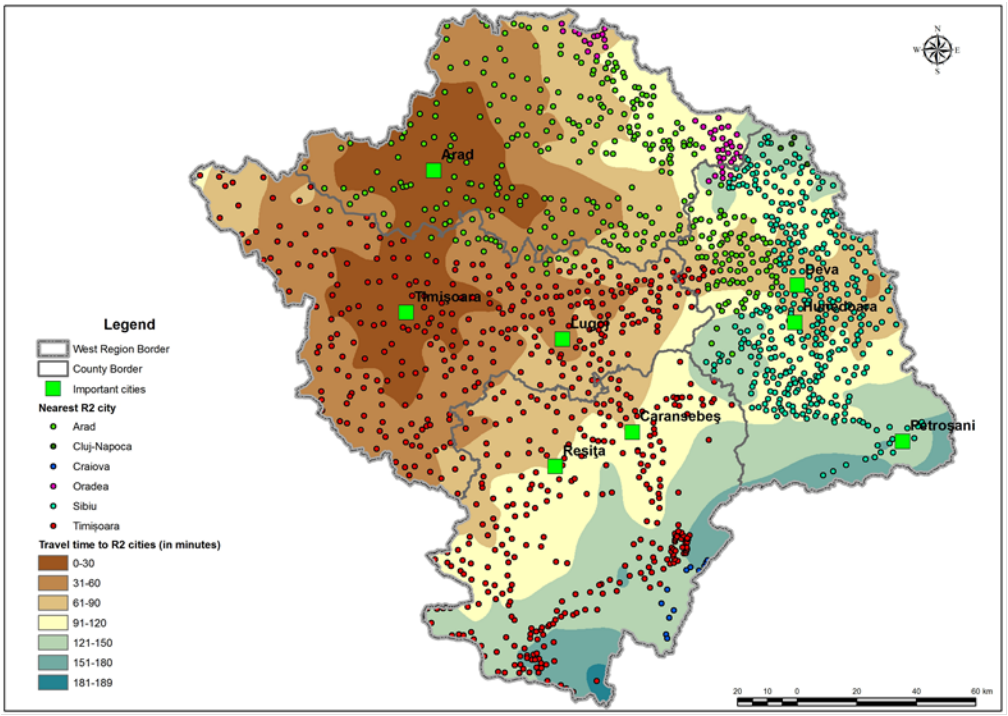


Source: Calculations based on methodology described in Box 4 and Box 6Box 5

It is worth highlighting that the implications of new transport infrastructure go beyond connectivity with Bucharest, but also open up access for remote parts of the region to other nearby growth centers like Cluj, Sibiu, and Ploieşti. Figure 32 shows that Sibiu would significantly increase its sphere of influence following the completion of the Corridor IV motorway, while Oradea and Cluj-Napoca would lose parts of their area of influence. This would have significant benefits for large parts of Hunedoara, which would improve their connectivity to a major urban center.

In summary, the proposed transport investments would offer significant improvements not only to the leading urban centers of Timisoara and Arad, but also of some of the more lagging parts of the region, although the southern parts of Caraș-Severin would remain relatively isolated. Under the scenario of full road and rail development, across all of the West Region, Bigăr, in southern Caraș-Severin would be the only settlements more than 3 hours away from any important city.

Figure 32: Estimated Connectivity to Secondary Romanian Cities with Completed Corridor IV Motorway and 22 TEN-T High Speed Rail

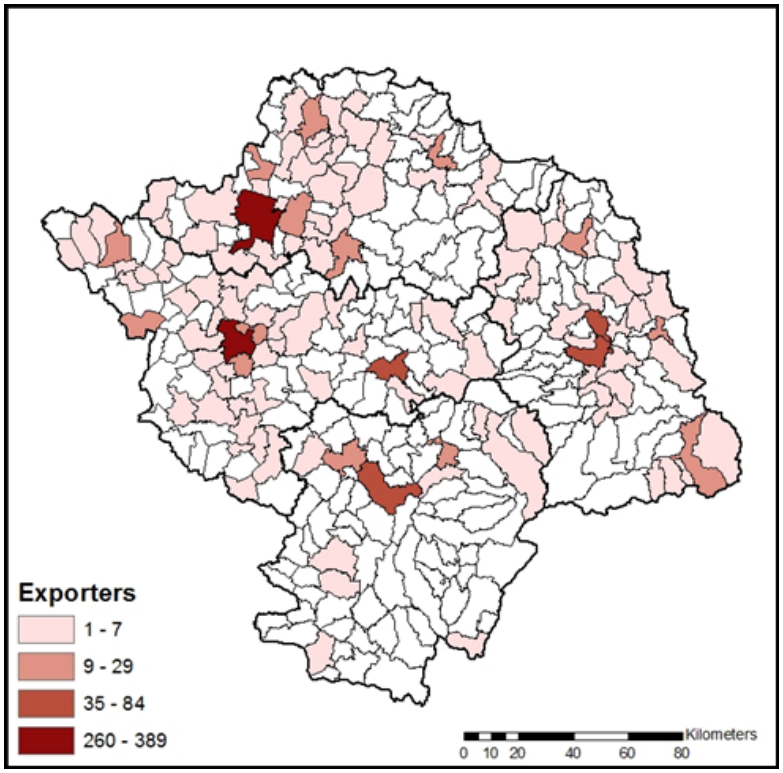


Source: Calculations based on methodology described in Box 4 and Box 6Box 5

6.2. Unexploited Opportunities with Serbia?

The map in Figure 33 highlights the little discussed fact that the closest major city to most parts of the West Region is Belgrade, Serbia. Most settlements in western Caraș-Severin County, western and south-western Timiș County are less than 150 km away from Belgrade. Almost all settlements in Timis and Caraș-Severin, and even most of Arad are within a three hour drive time of the city. With a population of around 1.5 million, the Belgrade is only slightly smaller than Bucharest and Budapest. At the moment however, due in large part to its position outside the European Union, Belgrade (and Serbia in general) remains almost completely disconnected from the economy of the West Region. Figure 33 illustrates the contrast between the Hungarian border, around which sits the largest concentration of exporters in the West Region, and the Serbian border, which is noted by its absence of any exporters along much of it.

Figure 33. Distribution of Exporters in the West Region



Source: Data from Institute of National Statistics (Customs transaction data); Map copyright ADR West

Table 6 shows just how limited export trade is with Serbia. Although the number of firms exporting to Serbia, particularly from Timis and Caras-Severin, has increased significantly in recent years, it still represents only a very small percentage of exporters from the region. Overall, only 1 percent of exports from the West Region were bound for the Serbian market in 2011, making this neighbor only the 19th most important export market for the West Region. And outside of Timis, virtually no exports are reaching Serbia. For Caras-Severin, the country that shares the largest border with Serbia, only 0.2 percent of exports are bound for the country. Interestingly, imports from Serbia are significantly higher, accounting for 3.6 percent of imports in the County.

Again, the low level of trade with Serbia is not surprising given that it is not an EU member. As a result customs duties remain on many important traded goods, particularly in agriculture, and non-tariff barriers are significant. Until 2011 Romanians still required visas to enter Serbia, thus doing business and building trade networks would have been difficult until very recently.

Table 6. Trading with Serbia

# firms exporting to Serbia	2007	2008	2009	2010	2011
ARAD	27	21	22	21	34
CARAS-SEVERIN	6	8	11	21	22
HUNEDOARA	6	6	7	7	6
TIMIS	63	80	65	75	87
West Region	**102**	**115**	**105**	**124**	**149**
% county/region exports	**2007**	**2008**	**2009**	**2010**	**2011**
ARAD	0.1	0.1	0.1	0.1	0.2
CARAS-SEVERIN	0.1	0.3	0.5	0.3	0.2
HUNEDOARA	0.7	0.5	0.1	0.1	0.1
TIMIS	2.3	2	1.3	0.7	1.7
West Region	**1.39**	**1.27**	**0.84**	**0.45**	**1.09**
# firms importing from Serbia	**2007**	**2008**	**2009**	**2010**	**2011**
ARAD	22	30	22	25	31
CARAS-SEVERIN	5	8	8	6	5
HUNEDOARA	4	10	11	11	8
TIMIS	59	62	58	66	75
West Region	**90**	**110**	**99**	**108**	**119**
% county/region imports	**2007**	**2008**	**2009**	**2010**	**2011**
ARAD	0.29	0.55	0.21	0.18	0.25
CARAS-SEVERIN	1.63	2.96	4.00	3.29	3.65
HUNEDOARA	0.09	0.92	0.32	0.24	0.34
TIMIS	0.57	0.87	0.88	0.80	0.63
West Region	**0.40**	**0.90**	**0.70**	**0.60**	**0.50**

Source: Calculations based on data from Structural Business Survey

Taking better advantage of opportunities for trade with Serbia could be particularly important for parts of Caraș-Severin that are among the most economically lagging in the West Region. One area of significant potential could be in agricultural exports. But more widely, opening up the Serbian market to trade with the West Region may create opportunities for the region to attract further FDI and could facilitate higher rates of new business creation. In the short term, divisions are likely to remain until Serbia accedes to the EU; this may hit agricultural trade, most notably through non-tariff measures at Serbian border.

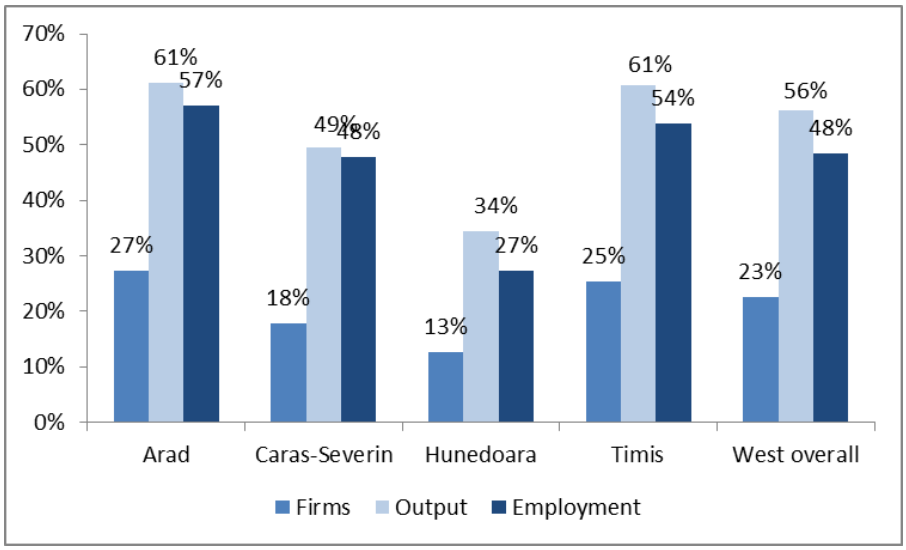
In the short term, however, improvements in transport connectivity, efforts to facilitate efficient border crossings, and enhanced investment in cross-border cooperation efforts (ongoing with the EU cross border cooperation office for Serbia-Romania, based in Resita) will be important to enable the region to take better advantage of the opportunity with Serbia.

6.3. Accessing Trade Opportunities through Key Borders

The success of leading parts of the West Region owes much to substantial foreign investment in branch plants to serve European markets. For lagging parts of the region, attracting such FDI, particularly as labor markets around Timișoara and Arad become saturated and wages rise, is likely to be an important platform for growth. Figure 34 highlights the how significant a role foreign owned firms have in output and employment in the region, and the gap that exists across counties. While foreign ownership is significant in Caras-Severin, its role still falls well below the levels in Timis and Arad; and in Hunedoara, foreign ownership remains limited.

For foreign investors to establish export oriented production in lagging parts of the West Region, not only must the labor market and broader investment environment be attractive but, critically, connectivity to European markets must be efficient. The challenge of connectivity for these lagging parts of the region has already been discussed. But an additional element that needs consideration is linking internal transport connectivity improvements to international border posts.

Figure 34. Foreign-Owned Firm Share of the Economy across Counties (2010)



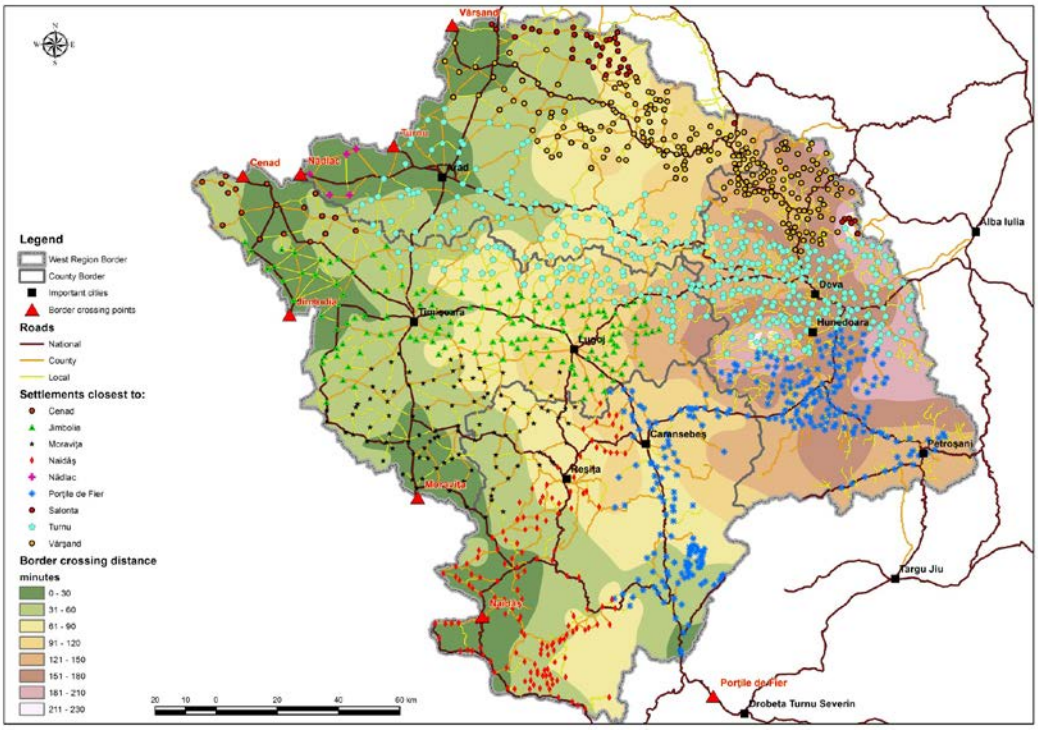
Source: Calculations based on data from Business Registry

Generally, investors looking to serve European markets will want to be within one hour from the border, if possible. The map in Figure 35 shows clearly how this situation reinforces the existing core-periphery pattern in the region. All areas along the borders with Hungary and Serbia, as well as much of the western parts of Arad, Timiș and Caraș-Severin counties, and also the South-East part of Caraș-Severin County, are within the one-hour isochrone from a border point. The attractiveness of Arad city and areas to the north and west of it to foreign investment is clear from the map – the Hungarian border can be accessed in less than half an hour. While Timișoara is less advantaged, it still is less than an hour away from Jimbolia.

Most of the rest of the region outside the existing core, however, remains more than one hour away from the closest border point. Reșița is almost 75 kilometers from a border crossing point, as Caraș-Severin has only one such point, at Naidăș, and this border, connecting with Serbia, is unlikely to be the ideal route for exporters, for example to the European automotive sector. Areas in south-eastern Caraș-Severin County are closer to Porțile de Fier border crossing point, in the neighboring Mehedinți County, but again, this is unlikely to be on the main transport route for exporters.

Moving eastward in the region, distance from border crossing points obviously grows accordingly. Times between 1 and 2 hours are characteristic for most of the eastern parts of Arad, Timiș and Caraș-Severin counties. Hunedoara County lies more than 2 hours away from any border crossing point. Deva, Hațeg, Brad and Petroșani are around 2.5 hours away, while Orăștie is almost 3 hours away.

Figure 35. Distance to Nearest Border Crossings in West Region



Source: Calculations based on methodology described in Box 4

7. Endowments and Institutions

The endowments and institutional environment of the West Region is discussed in some detail in the report "Territorial Assessment: Profile, Performance, and Drivers of Growth in the West Region". In this report, we will focus only on the significant differences at the sub-regional level that are likely to have shaped existing territorial disparities and, more importantly, may impact on efforts to address the territorial development challenges in the region.

7.1. Historical Endowments and Local Productive Systems

As discussed in the report "Territorial Assessment: Profile, Performance, and Drivers of Growth in the West Region", the physical geography of the region has played an important role through history in shaping the development trajectories in different parts of the region. The Banat Plain, runs along the western border of the region and takes in most of Timis county and the western half of Arad county. Its agricultural richness and, more importantly, accessibility to the west, helped make this part of the region the most cosmopolitan in outlook and the most integrated with Europe.

The interior parts of the region were shaped by the predominance Carpathian Mountains. In the case of the eastern parts of Arad this largely was a legacy of inaccessibility. Hunedoara and Caraș-Severin at least benefited from the mineral resources of the mountains, specifically the substantial reserves of coal. This in turn fuelled the development of the mining and metallurgy industries in these counties, a specialization that was reinforced through the mono-industrial development strategies of the Communist era. Timișoara and Arad, meanwhile benefited from the industrialization that these strategies facilitated, but without the downside of excessive concentration.

These historical endowments and development patterns still play a significant role in shaping the economies of the counties today. Table 7 shows the five sectors (NACE 2 digit) in which each county is most specialized in the national context. It shows clearly that Timis and Arad are specialized across a range of manufacturing sectors, with Timis specialized in several more sophisticated manufacturing sectors. Hunedaora and Caras-Severin, meanwhile remain specialized in sectors linked to their physical endowments and long part of the cultural identity of their area – forestry and mining in Hunedoara; mining and metals (as well as wood products) in Caras-Severin. On the other hand, it is noteworthy that the motor vehicles sector, as well as other manufacturing sectors are among the leading areas of specialization in all counties. Thus suggests that historical endowments are not everything, and that the types of investments that catalyzed growth in Timis and Arad are spreading, at least to some extent, to other parts of the region.

Table 7. Top 5 Most Specialized Basic Sectors by County (2010)

Arad			Caras-Severin		
NACE	Description	Location Quotient	NACE	Description	Location Quotient
29	Motor vehicles	5.3	28	Machinery and Equipment	5.3
32	Other Manufacturing	3.8	24	Basic Metals	4.0
30	Other Transport Equipment	3.5	07	Mining Metal Ores	3.3
31	Furniture Manufacturing	2.5	16	Wood and Wood Products	3.1
26	Computer, Electronic and Optical	2.3	29	Motor vehicles	3.1
Hunedoara			**Timis**		
NACE	Description	Location Quotient	NACE	Description	Location Quotient
02	Forestry and Logging	19.9	26	Computer, Electronic and Optical	6.1
05	Coal Mining	17.1	27	Electrical Equipment	3.5
32	Other Manufacturing	4.0	29	Motor vehicles	3.2
08	Other Mining	2.7	15	Leather Products (Footwear)	3.0
29	Motor vehicles	2.6	22	Rubber and Plastics	2.6

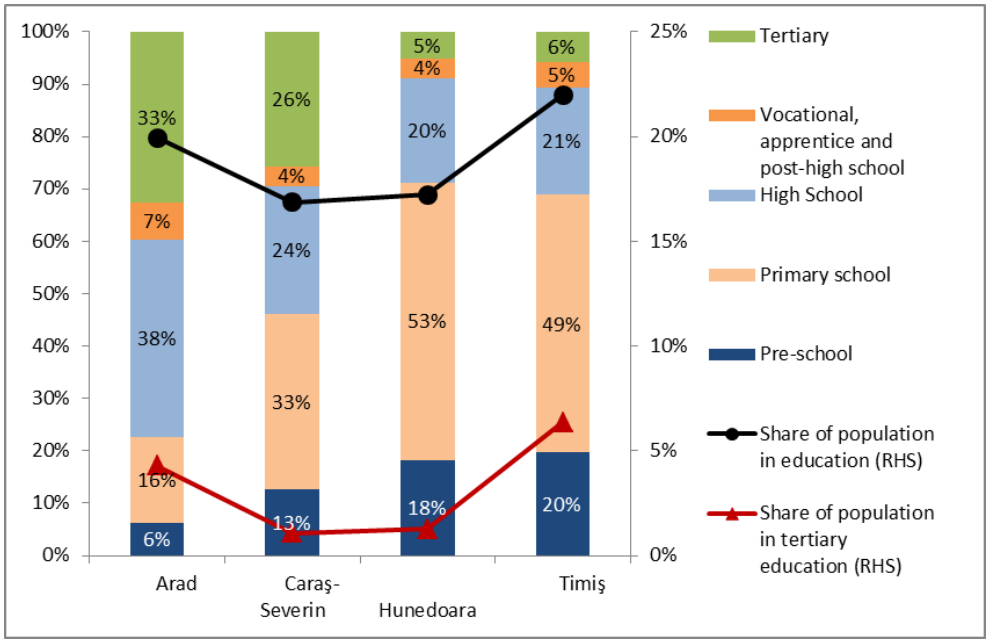
Source: Calculations based on data from Structural Business Survey
Note: Basic sectors include those sectors which sell primarily outside the local area; Specialization defined as the sectors with the highest location quotient for employment relative to the national context.

7.2. Human Capital and Educational Endowments

The most important endowment from a regional perspective is the human capital of the population. Here, the parallel with economic outcomes is readily apparent, with Timis, and secondly Arad, standing out dramatically ahead of Caraș-Severin and Hunedoara (Figure 36). Not only do Timis and Arad have a significantly higher share of their population in education, but most importantly this is driven by the population in tertiary education. The share of the population in tertiary education in Timis is 50 percent higher than it is in Arad, 5 times higher than in Hunedoara and six times higher than in Caras-Severin. Interestingly, Figure 36 shows that the high participation of Timis in tertiary education is not driven by demographics. In fact, looking only at the populations currently in education across the four counties, Timis has the second smallest share in tertiary education. This reflects the more positive demographic trends in Timis, with a large population of pre-school and primary school students. Arad, meanwhile, has a large tertiary student population, but a demographic situation heavily weighted against the primary and pre-school ages.

This is driven in part by the concentration of tertiary institutions in Timis, and particularly in the main urban agglomeration of Timișoara. As Table 8 shows, Timis stands out far ahead of the rest of the region in terms of its tertiary education infrastructure, hosting 9 of the 14 tertiary institutions and capturing 60 percent of the overall tertiary student population in the region. It is also worth noting that the female share of the student population in Timis and Arad is substantially higher than in Caraș-Severin and Hunedoara, suggesting that the universities remain linked to the historical specializations of their localities. While this might provide opportunities from a research and development perspective, it also raises the risk of reproducing existing regional path dependence.

Figure 36. Distribution of County Population in Education across Levels of Education and Share of Total County Population in Education (2009-2010)



Source: Calculations based on data from Institute of National Statistics: School aged population, at territorial level and level of education, in 2009/2010 school year

Table 8. Tertiary Education Infrastructure in the West Region (2010)

	Tertiary Institutions		Faculties		Students		Female share of students
	Total	*per m population*	Total	*per m population*	Total	*per m population*	
West	**14**	***7.3***	**79**	***41.3***	**72,124**	***37,686***	53%
Arad	2	*4.4*	25	*54.9*	19537	*42,893*	58%
Caras-Severin	1	*3.1*	2	*6.2*	3415	*10,604*	48%
Hunedoara	2	*4.3*	5	*10.8*	5907	*12,755*	38%
Timis	9	*13.3*	47	*69.2*	43265	*63,738*	54%

Source: Calculations based on data from Institute of National Statistics: Tertiary education, at territorial level, in 2009/2010 academic year (day, evening, part-time education and learning at distance)

7.3. Governance and Institutional Environment

Very little data exists to allow for a proper assessment of the institutional environment at the sub-regional level. In terms of governance quality, while for the first time a comparative assessment has been made across European regions (see Charron, Lapuente, & Dykstra, 2012), this goes only to the NUTS-2 level. At the sub-regional level, the main source of power rests with the county and local (city) councils, which have responsibility for the administration of public funds and power over key issues like land development, roads, and other infrastructure.

Table 9 provides a summary of the budgets at the county level. It is notable that the per capita budgets are lowest in the 'lagging' counties of Caras-Severin and Hunedoara, and that the state subsidy per capita is lowest in Caras-Severin.

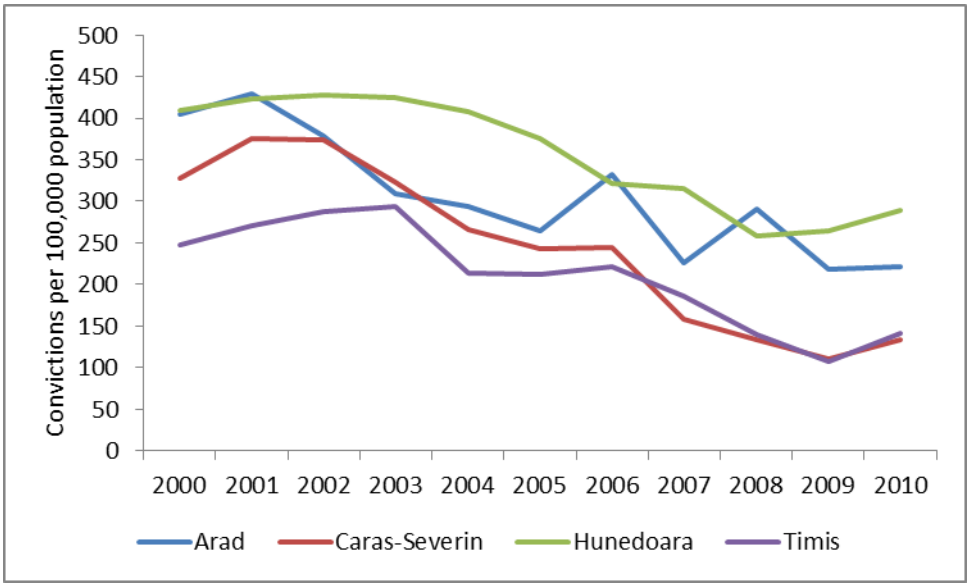
Table 9. County Budgets in West Region (2005-2010)

	County revenues per capita (RON), incl state subsidy					
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Arad	933	1,366	1,679	1,990	2,035	2,301
Caras-Severin	905	1,174	1,478	1,709	1,793	1,766
Hunedoara	896	1,306	1,622	1,958	2,030	2,049
Timis	1,104	1,478	1,965	2,283	2,226	2,184

Source: Calculations based on data from Institute of National Statistics: Execution of the local budgets by categories of incomes and expenditures, macroregions, development regions and counties

Another measure often used as a proxy for the broad institutional environment of a region is the level of crime and social disturbance. Here we can see (Figure 37) clear differences across the counties. While crime (or at least convictions) have declined in all counties over the last decade, rates are in Timis and Caras-Severin are half what they are Hunedoara and substantially lower than in Arad.

Figure 37: Criminal conviction rates per 100,000 inhabitants



Source: Calculations based on data from Institute of National Statistics: Criminality rate by macroregions, development regions and counties

8. Considerations for Policy Actions: Addressing the Challenges of Uneven Development

The West Region of Romania is the wealthiest region in the country outside of Bucharest, with a per capita GDP 10 percent higher than the national average. For most of the past decade, the region experienced rapid economic growth and convergence with Europe. But the fruits of this growth were not distributed evenly across the region. Substantial inequalities in economic and social outcomes were exacerbated sharply over the past decade. These spatial differences in outcomes are linked directly to differences in competitiveness – Timis, and more broadly the Timis-Arad agglomeration is increasing pulling away from the rest of the region on virtually every measure of competitiveness. Failure to address these growing disparities will not only have an impact on the opportunities and quality of life of many residents in these lagging areas, but will act as a barrier to the growth and development of the region as a whole.

As the region looks forward to moving to the next stage of development and matching the living conditions in the richer parts of Europe, it faces a dual challenge. On the one hand, in Caras-Severin, Hunedoara, and parts of Arad, the challenge is one of generating and capturing greater employment opportunities. By contrast, in the Timis-Arad agglomeration, the challenge is managing the transition toward a more knowledge and skills intensive basis for competitiveness. Achieving continued strong growth and moving the economy to a higher value added position while also addressing the substantial and deep-rooted spatial inequalities will require a carefully tailored development strategy. Among the elements that this strategy should consider are the following:

1. *Continuing to promote FDI, encouraging the 'two-tier' strategy*

Despite the concerns about over dependence on foreign investors, the attraction of the region to foreign manufacturers has been an important catalyst for the region's growth over the past decade. More recently, there is evidence that some of the same investors that initially established plants around Timisoara and Arad are making further investments in other parts of the region. At the same time existing and new investors are establishing research and development centers in Timisoara. This raises the prospect of a two-tier strategy for investment in the region, with more skills intensive 'command-control' activities concentrating in the Timisoara-Arad conurbation, while more labor intensive activities locate in more peripheral parts of the region. Whether such a strategy is in fact implemented by many individual firms, it still represents a suitable model for the region to pursue in its FDI promotion strategy.

This obviously has implications for the types of infrastructure and services that will be required in the core agglomeration: for example, premises for corporate and research activities, quality telecommunications, business services, links to universities, and broader amenities; as well as in the more peripheral areas: for example, access to well serviced and managed industrial infrastructure, transport links, an available and qualified workforce.

2. *Facilitating the integration of the Timisoara and Arad economies into a metropolitan conurbation*

Processes of industrial development and suburbanization are contributing to creating a strong growth corridor between Timisoara and Arad. It has been clear for some time that significant potential exists to leverage the integration of these cities. Ongoing initiatives as part of the national 'growth poles' project are supporting this process. Much more can still be done. Improving connectivity between the cities would greatly enhance integration and open up substantial flexibility in the regional labor market. This may include further improvements in road connectivity, but also the potential to take more advantage of the rail network, including possibly high speed rail. It could also include more integrated spatial planning along the corridor. Beyond this both cities should continue to prioritize investments designed to improve the quality of life of the cities and their wider regions.

3. *Improving connectivity to the Timisoara-Arad conurbation*

One of the priority means to reduce territorial disparities in the West Region is to improve internal connectivity with the Timișoara-Arad conurbation, which has been shown throughout this report to be the engine of growth for the region. Addressing this involves both looking at ways to expand the catchment area of the conurbation to absorb a wider commuting workforce in the region as well as improving general connectivity to allow businesses, workers, and consumers in the region to benefit from access to a larger market. Among the key considerations here will again be the possibility of making greater use of the rail network to expand the reach of commuting, as well as the possibilities to improve public bus links between the inner cities, the suburbs, and the industrial areas.

4. *Improving connectivity to Bucharest and the rest of the country*

Connectivity between the region and the rest of Romania, particularly Bucharest, remains extremely poor. While the western parts of the region, including Timisoara and Arad, are furthest from Bucharest, it is in fact the eastern parts of the region that may suffer most of the disconnect. They remain far from markets to the west, but also distant and poorly connected to Bucharest and other important urban areas elsewhere in the country. The priority transport infrastructure projects of the national government – the Transylvania Highway and the Pan-European Corridor IV and the high speed rail line – would make significant improvements to the accessibility of the region to Bucharest. This could have significant implications not only in terms of better integrating the regional economy with the national economy, but in opening up access for remote parts of the region to other nearby growth centers such as Sibiu, and to a lesser degree Cluj and Ploieşti. In addition, improved access to Timisoara Airport from other parts of the region may also help reduce their peripherality. On the other hand, the existing major infrastructure projects will not help all parts of the region; specific attention may be required to improve connectivity for other areas, like Caras-Severin.

5. *Exploiting more the opportunities with Serbia*

Belgrade is the closest major city to most parts of the West Region, yet Belgrade (and Serbia in general) remains almost completely disconnected from the economy of the West

Region. Taking better advantage of opportunities for trade with Serbia could be particularly important for parts of Caraș-Severin that are among the most economically lagging in the West Region. This will likely come in the future as Serbia integrates more with the EU. In the short term, however, improvements in transport connectivity, efforts to facilitate efficient border crossings, and enhanced investment in cross-border cooperation efforts (particularly shifting greater emphasis toward commercial ties) will be important to enable the region to take better advantage of the opportunity with Serbia.

6. *Supporting entrepreneurship and SME development*

Low rates of business creation in lagging parts of the West Region underscores the importance of continuing to invest to support entrepreneurship, and in providing support to existing SMEs in these regions. This should be done in the context of local economic development strategies built around localized sources of comparative advantage (see point 7 below)

7. *Promoting local economic development strategies*

Lagging parts of the region should be encouraged to exploit localized sources of comparative advantage. Many exist, including potential for expanding the tourist sector in eastern Arad, Hunedoara, and Caras-Severin, developing local and organic agricultural potential throughout the region, and exploiting the potential for sustainable energy development (including wind, photovoltaic, geothermal), to name just a few. The challenge is to quantify the opportunities, identify what will be required to take advantage of them, and mobilize the resources to deliver on it. This can only be done effectively through the bottom up elaboration of local economic development strategies, by local stakeholders, building on local assets. Taking advantage of EU resources and experience in facilitating these efforts should be one of the region's priorities in the coming years.

8. *Building local institutional capacity*

Linked closely to the above point, strategy development and delivery will depend on ensuring that local institutions are representative, forward looking, and capacitated (both in terms of experience and resources). Again, European partners have significant experience in financing and implementing programs to support the development and mobilization of local partners.

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Annex 1: Statistics for Top 10 Employment Sectors by County (2010)

ARAD								
Rank	NACE 2	Description	Employment	% of total	Avg wage v county avg (all sectors)	Avg wage v West avg (within sector)	Output growth (2008-2010)	Employment growth (2008-2010)
1	29	Manufacture of Motor Vehicles, Trailer	15,166	23.0%	1.05	0.98	54%	23%
2	14	Manufacture of Wearing Apparel [14]	5,049	7.6%	0.76	0.72	10%	-23%
3	46	Wholesale Trade, Except of Motor Vehi	3,857	5.8%	0.95	0.89	-15%	-17%
4	49	Land Transport and Transport Via Pipe	3526	5.3%	0.92	0.87	26%	-17%
5	47	Retail Trade, Except of Motor Vehicles	3487	5.3%	0.88	0.82	5%	-18%
6	31	Manufacture of Furniture [31]	3,034	4.6%	0.99	0.93	24%	-16%
7	30	Manufacture of Other Transport Equipr	2483	3.8%	1.13	1.06	-54%	-20%
8	41	Construction of Buildings [41]	2376	3.6%	1.09	1.03	6%	-29%
9	15	Manufacture of Leather and Related Pr	1,906	2.9%	0.72	0.68	68%	-28%
10	25	Manufacture of Fabricated Metal Produ	1,670	2.5%	1.24	1.16	22%	-15%
				64.4%				
CARAS-SEVERIN								
Rank	NACE 2	Description	Employment	% of total	Avg wage v county avg (all sectors)	Avg wage v West avg (within sector)	Output growth (2008-2010)	Employment growth (2008-2010)
1	29	Manufacture of Motor Vehicles, Trailer	3,645	13.3%	0.84	0.67	1431%	1669%
2	28	Manufacture of Machinery and Equipm	2,693	9.8%	1.03	0.82	-24%	-2%
3	47	Retail Trade, Except of Motor Vehicles	2,193	8.0%	0.76	0.60	7%	-8%
4	42	Civil Engineering [42]	1784	6.5%	0.72	0.57	58%	-14%
5	24	Manufacture of Basic Metals [24]	1583	5.8%	1.77	1.41	20%	-28%
6	10	Manufacture of Food Products [10]	1,438	5.2%	0.80	0.64	14%	-11%
7	14	Manufacture of Wearing Apparel [14]	1259	4.6%	0.65	0.52	-47%	-53%
8	16	Manufacture of Wood and of Products	1154	4.2%	0.72	0.58	15%	-32%
9	46	Wholesale Trade, Except of Motor Vehi	1,042	3.8%	0.79	0.62	-27%	-9%
10	49	Land Transport and Transport Via Pipe	932	3.4%	0.79	0.63	-26%	-41%
				64.4%				
HUNEDOARA								
Rank	NACE 2	Description	Employment	% of total	Avg wage v county avg (all sectors)	Avg wage v West avg (within sector)	Output growth (2008-2010)	Employment growth (2008-2010)
1	05	Mining of Coal and Lignite [05]	9,194	14.7%	1.77	1.73	-11%	-20%
2	29	Manufacture of Motor Vehicles, Trailer	6,988	11.2%	0.92	0.91	49%	12%
3	47	Retail Trade, Except of Motor Vehicles	4,554	7.3%	0.70	0.68	-12%	-30%
4	35	Electricity, Gas, Steam and Air Conditio	3242	5.2%	2.07	2.03	-18%	0%
5	46	Wholesale Trade, Except of Motor Vehi	2876	4.6%	0.72	0.70	-31%	-33%
6	49	Land Transport and Transport Via Pipe	2,752	4.4%	0.73	0.72	-16%	-19%
7	80	Security and Investigation Activities [8	2383	3.8%	0.55	0.54	15%	-25%
8	41	Construction of Buildings [41]	2373	3.8%	0.68	0.66	-15%	-47%
9	10	Manufacture of Food Products [10]	2,191	3.5%	0.50	0.49	-32%	-27%
10	14	Manufacture of Wearing Apparel [14]	2,143	3.4%	0.66	0.65	4%	-30%
				61.9%				
TIMIS								
Rank	NACE 2	Description	Employment	% of total	Avg wage v county avg (all sectors)	Avg wage v West avg (within sector)	Output growth (2008-2010)	Employment growth (2008-2010)
1	29	Manufacture of Motor Vehicles, Trailer	16,673	14.0%	1.09	1.26	104%	31%
2	49	Land Transport and Transport Via Pipe	7,272	6.1%	0.88	1.03	35%	40%
3	15	Manufacture of Leather and Related Pr	6,843	5.7%	0.67	0.77	0%	-31%
4	26	Manufacture of Computer, Electronic a	6390	5.4%	1.29	1.50	-1%	-13%
5	10	Manufacture of Food Products [10]	5620	4.7%	0.90	1.05	9%	-4%
6	27	Manufacture of Electrical Equipment [2	5,508	4.6%	0.87	1.02	5%	-15%
7	52	Warehousing and Support Activities fo	5063	4.2%	1.11	1.29	29%	2%
8	41	Construction of Buildings [41]	4873	4.1%	0.72	0.83	-51%	-44%
9	22	Manufacture of Rubber and Plastic Pro	4,280	3.6%	1.16	1.35	41%	1%
10	43	Specialised Construction Activities [43	4,183	3.5%	0.85	0.99	14%	-25%
				55.9%				

Source: Structural Business Survey

Annex 2: Connectivity to Secondary Regional Agglomerations

Resita – Caransebes

The two main urban centers of Caraș-Severin County, Reșița (the county seat) and Caransebeș, are at about 45 minutes journey time from each other, therefore the 20 minutes isochrone is individualized for each of them. The rather mountainous morphology of most of Caraș-Severin County makes the journey times generally longer, because of the slopes and the fewer number of roads.

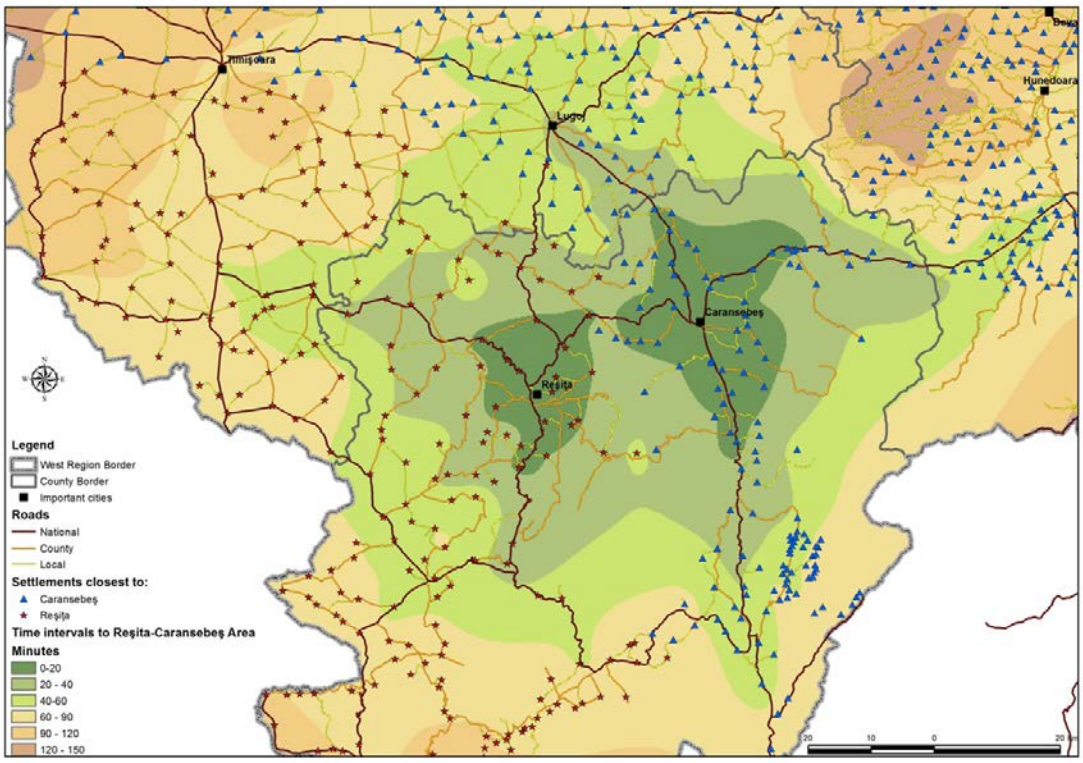
The 20 minutes isochrone for Reșița therefore includes only a small area around the city, to Bocșa in North, Carașova in South, Brebu in the East and Lupac in the West. The same isochrone for Caransebeș is larger and elongated on the North-South direction, followed by the main road, along Timiș-Cerna Corridor, up to Sadova Nouă în the South and down to Sacu in the North. On the Bistra Corridor to the East, the isochrone includes the town of Oțelu Roșu.

The next isochrone, of 40 minutes, covers most of the northern half of the county, going even beyond the county limits, reaching for instance as far as Lugoj in Timiș County (less than 40 minutes to Caransebeș) and Măureni, on the county boundary, in the direction to Timișoara (less than 40 minutes from Reșița).

The area where one can get in one hour from either Reșița or Caransebeș is of course larger, but it does not cover the entire county, due to the already mentioned mountainous character of the topography and the lack of good roads, especially in the southern half of the county. Therefore, the area covered by this isochrone does not include Almăj Basin, the western and southern Oravița Basin, and none of the settlements of the Danube Valley, Cerna Valley, Locva, Almăj and Mehedinți Mountains. However, the area covers most of Lugoj Hills and Plain, as well as Gătaia Plain, in Timiș County, and the western half of Hațeg Basin in Hunedoara County.

The 90 minutes iscohrone already covers almost entirely Caraș-Severin County and reaches as far as Timișoara, Hunedoara and Simeria.

A2: 1: Connectivity to Resita - Caransebes



Source: Calculations based on methodology described in Box 4

Deva – Hunedoara – Simeria

The cities of Deva and Hunedoara are the main urban centers of Hunedoara County and, together with Simeria and Călan, form an urban quadrant located in the center of this county, providing services and jobs for its inhabitants.

Although Hunedoara County is also a mountainous region, its central area, including the urban centers for which this analysis is performed, is more accessible than in the case of Caraș-Severin County. The large Mureș and Strei corridors are accompanied by important roadways, therefore journey times are accordingly smaller as compared to the situation in Caraș-Severin County.

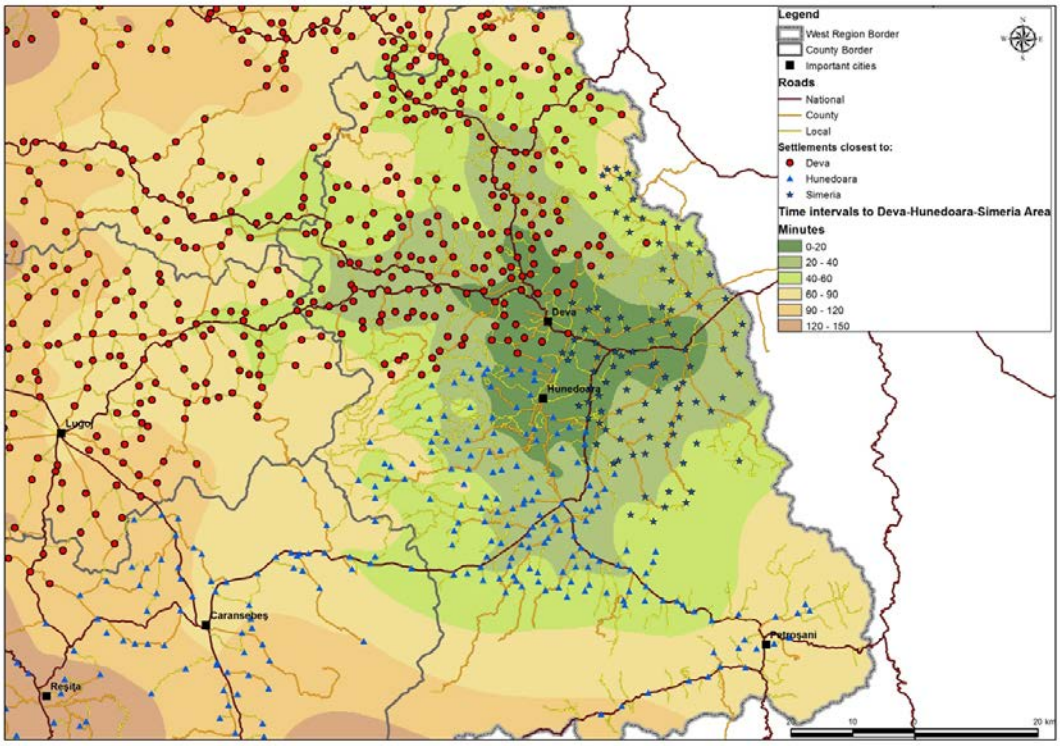
Therefore, one can get to either Deva, Hunedoara or Simeria in less than 20 minutes from Leșnic to Orăștie along the Mureș Corridor, up to Bretea Română on the Strei Corridor, as well as from most settlements in southern Metaliferi Mountains, from the eastern fringe of Poiana Ruscă Mountains and Hunedoara Hills.

The area covered by the next isochrone, of 40 minutes, reaches as far as Holdea near the border with Timiș County, not far from Zam, on the border with Arad County, and crosses into the neiguhboring Alba County. It also includes most of Brad and Hațeg basins, most of Metaliferi, Poiana Ruscă and northern Șureanu Mountains.

People can get to Deva in one hour or less from Săvârșin on Mureș Valley or Hălmagiu on Crișu Alb Valley, both in Arad County, or from Făget, in Timiș County. The one-hour isochrone also extends to the southern part of Alba County, a small part of Sibiu County, and includes Hunedoara County almost entirely, except for Petroșani Basin and isolated villages in Găina, Metaliferi or Poiana Ruscă Mountains.

One step further, the 90 minutes isochrone already covers the whole Hunedoara County and reaches as far as Lugoj in Timiș County, Caransebeș in Caraș-Severin County, large parts of eastern Arad County, and even to the South-East of Bihor County, in Beiuș Basin.

A2: 2: Connectivity to Deva – Hunedoara – Simeria



Source: Calculations based on methodology described in Box 4

Petrosani – Jiu Valley

In this case, the analysis is focused on Petroșani, as the main urban center of Petroșani Basin and upper Jiu Valley and also the closest town of the basin for most settlements outside of it, because it is located centrally, on the main road which connects the basin to the outside world (Simeria – Hațeg – Petroșani – Târgu Jiu).

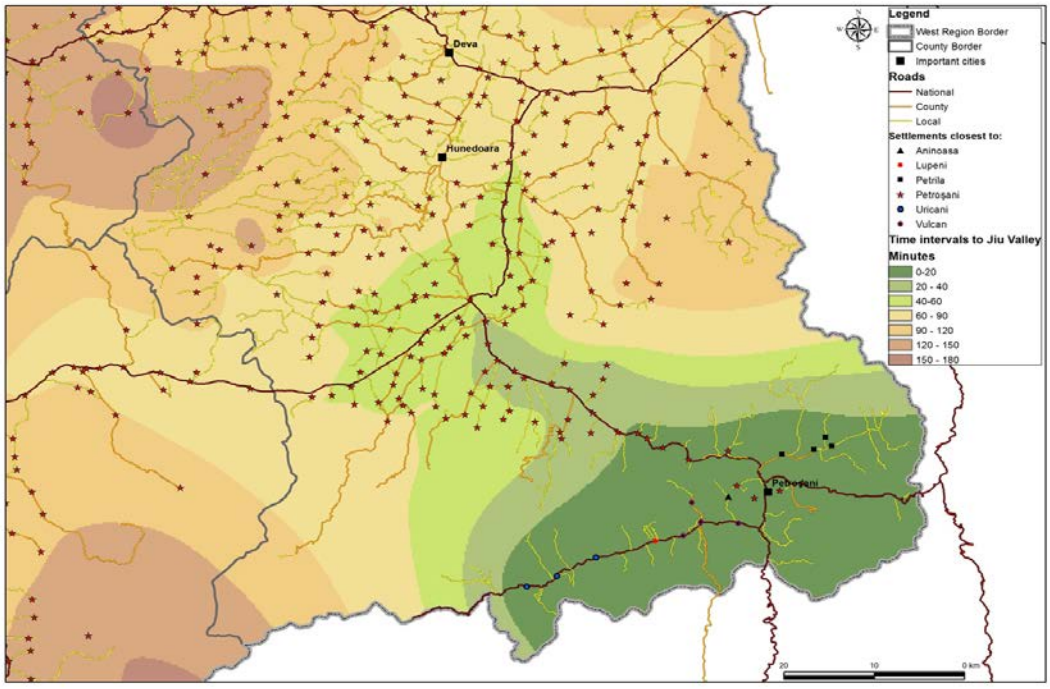
As the analysis is made only on journey times from within the West Region, we did not assess commuting times from the neighboring counties, despite the marginal position of Petroșani Basin in Hunedoara County, particularly, and in the West Region, generally.

The first isochrone, that of 20 minutes, perfectly covers the area of Petroșani Basin, due to the fact that all urban centers have been taken into consideration (Petroșani, Petrila, Lupeni, Vulcan, Uricani, Aninoasa). The few existing rural settlements are all close to at least one of these towns. The area goes beyond Merișor Pass, getting close to Baru, in Hațeg Basin. It also covers parts of Gorj (Jiu Gorges) and perhaps Vâlcea (Obârșia Lotrului area) counties.

Most settlements of southern Hațeg Basin need between 20 and 40 minutes to get to Petroșani, while all the others, together with settlements of Strei Valley down to Călan need between 40 minutes and 1 hour. One needs between 1 hour and 1 hour and a half to get from Petroșani to Hunedoara or to Mureș Corridor, at Simeria.

Petroșani Basin remains a rather isolated area due to its weak connectivity to the surrounding regions and the barriers that roads need to surpass in order to provide access. The road by Jiu Gorges, to the South, is rather difficult, as well as the mountain road to Obârșia Lotrului, which connects Petroșani Basin to Lotru Valley. High speeds on these roads are impossible to achieve, even if they are classified as national roads. The main road to the North and North-West, passing through Merișor Pass, was much improved lately, but it is still difficult due to the topography. The road to the West and South-West, to Cerna Valley, is still at the very initial stage of a project that one can envisage for the future.

2: 3: Connectivity to Petrosani – Jiu Valley



Source: Calculations based on methodology described in Box 4