ROMANIA WESTERN REGION COMPETITIVENESS ENHANCEMENT AND SMART SPECIALIZATION

Final Report

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Executive Summary

I. **The aim of the Europe 2020 Strategy, launched in 2010, is to tackle structural weaknesses in Europe's economy, while reducing regional disparities in income, wealth and opportunities**. To achieve the Europe 2020 objectives of smart, sustainable and inclusive growth, European Union (EU) Member States are encouraged to define "smart specialization" strategies. A "smart specialization" approach is understood as an organic set of policies and measures aimed at increasing knowledge content and value added in industries where comparative advantages are already revealed, and on facilitating the development of new economic activities through entrepreneurship and experimentation.[1]

II. **Romania's West Region is developing a smart specialization strategy, assisted by the World Bank.** The objective is to develop an in-depth competitiveness and smart specialization assessment of services and goods producers and to identify policy measures, interventions and smart specialization niches that can help nurture their growth potential. The World Bank's advisory services encompass seven deliverables, which will be used by the West Region' Regional Development Agency (RDA West) as inputs in establishing its regional development priorities.

1. Trade Outcomes Assessment
2. Territorial Assessment: Profile, Performance, and Drivers of Growth
3. Economic Geography Assessment: Territorial Development Challenges
4. Trade and Transport Facilitation and Logistics Infrastructure Assessment
5. Competitiveness of West Romania Firms: Diagnostics, Challenges, and Opportunities
6. Smart Specialization Sector Case Studies.
7. Final Report: Policy Recommendations

III. **Growth in the West Region has been strong, driven by a vibrant enterprise sector and marked export orientation.** Since the late 1990s the region has experienced rapid economic growth, which has delivered rising real wages and commensurate improvements in productivity. The annual growth rate of output per worker amounted to 15% in the 2000-09 period. Moreover, there are important signs of entrepreneurial activity and the Region has one of the highest concentrations of enterprises and exporters in Romania. The region is ranked third in the country in numbers of firms per capita with 211.5 firms per 100,000 inhabitants; it also has the third highest percentage of exporters in the country (15.7%).

IV. **Regional development has been somewhat unbalanced, with significant territorial disparities and a high concentration of economic activity and exports.** A number of challenges must be overcome to shift the region's productive system towards higher value added activities and accelerate convergence with the most advanced regions of the EU. First, the fruits of the strong growth of the past decade have not been distributed evenly, as indicated by significant territorial disparities in wages, productivity and exports. Second, economic activity is concentrated in a handful of sectors that represent about half the region's turnover and employment, which may lead to high volatility in value added growth and sharp drops in per capita gross domestic product (GDP) and employment during a

[1] http://ec.europa.eu/research/innovation-union/index_en.cf

crisis. Third, the export-driven growth model of the past decade is vulnerable to shocks in export markets.

V. **Physical, human, natural and cultural endowments can be leveraged to achieve more inclusive and sustainable growth.** The West Region benefits from a number of competitive strengths. Infrastructural endowments are relatively plentiful and facilitate access to neighboring countries. The region's workforce is skilled, owing to a tertiary education system that is relatively strong in natural sciences, mathematics, computer science, food science, agriculture, and medical and veterinary sciences. A favorable geographic location, a largely pristine natural environment and unexploited cultural and archaeological assets offer additional possibilities for specialization in higher value added activities.

VI. **The region has an apparent comparative advantage in automotive, textiles, and information and communication technology (ICT) and a latent comparative advantage in agro-food and tourism.** Six clusters (automotive, textiles, agro-food, ICT, construction, and tourism) were selected for in-depth analysis, not as "winning" activities per se, but because of their relevance and potential in the region. Available information suggests an apparent comparative advantage in automotive, textiles and ICT, while agro-food and tourism were identified as clusters with latent comparative advantage. The construction cluster, however, has an unclear comparative advantage.

VII. **Each industry cluster has constraints and specificities that will shape future progress towards smart specialization.** For the automotive sector, the overarching challenge is to diversify towards higher value added activities, which requires moving up the international value chain. The textile sector also needs to increase value added by building the skills and capacities that firms need to start producing their own design or brand. For the agro-food sector, taking into account the complex, and increasingly global, features of the value chain, challenges include improving marketing of local produce and establishing linkages with large distribution chains. In ICT - generally regarded as internationally competitive in software development, design and engineering - the main challenge is to expand the current set of activities and overall productive capacity. For the construction sector, it is important to better use the available source of construction materials in the region (stone and wood) and to increase the use of energy efficient materials and technologies, which, although encouraged by the European Union, are not yet widespread in the region. For tourism, ownership at a high political level and institutional coordination are key to taking full advantage of natural and cultural endowments.

VIII. **Horizontal policies, often the remit of the central level of government, are needed to foster smart specialization in the region.** Four of the most sensitive policy areas are common to all sectors: (i) education and training (expansion and improvement of the vocational school system, industry-relevant curricula and training in entrepreneurial and business management skills); (ii) improvements in local transport infrastructure (road and rail); (iii) expansion of access to finance; and (iv) the enhancement of the institutional framework for innovation.

IX. **Sector specific actions can complement horizontal policy reforms.** For the automotive cluster, these include the establishment of research institutes and testing laboratories and the promotion of the auto cluster. For the textile cluster, it would be helpful to facilitate access to finance for the acquisition of new technologies. In agro-food, it is essential to: develop facilities for improving quality and health and safety standards; to promote small and medium enterprises (SME) financing and marketing; and to support basic and applied research. For the ICT cluster, it would be helpful to expand the range of services offered by incubators and business accelerators, and to introduce more effective mentorship programs. In construction, useful measures include targeted support for the regional construction and energy cluster (ROSENC) and the inclusion of energy-efficient materials among the

award criteria for government infrastructure tenders and measures to facilitate entry and exit of firms. In the tourism cluster, promotion and management of archaeological sites, promotion of regional spas as cross-border medical tourism destinations, and eco and urban tourism are some of the areas that could be targeted.

X. **EU structural funds and other sources can support horizontal and sector specific actions according to priority axes and thematic objectives.** The EU structural funds available for the 2014-2020 programming period can be leveraged to achieve horizontal and sector specific objectives in line with a "smart specialization" strategy for the West region. The availability of national resources and mobilization of private sector financing can enhance the ownership and effectiveness of specific interventions. Following the guidelines of the European Commission, a number of thematic objectives, as defined by the EU Cohesion Policy, are deemed relevant for the West Region and grouped under priority axes.

Priority axis (PA)	Thematic objective (TO)
PA1: Regional competitiveness enhancement and smart specialization	TO1. Strengthening research, technological development and innovation TO3. Enhancing the competitiveness of small and medium-sized enterprises TO11. Enhancing institutional capacity and an efficient public administration
PA2: Protect nature and cultural assets of the region	TO 6. Protecting the environment and promoting resources efficiency
PA3: Education for all at high standards	TO 10. Investing in education, skills and lifelong learning

XI. **Investment priorities can be tailored to the particular needs of the region and can be promoted with regional initiatives.** These can be directed to: (i) increasing financing for regional research, development and innovation (priority Axis 1); (ii) promoting energy efficiency and the use of renewable energy (priority Axis 2); and (v) increasing the employability of the labor force by improving the skills and competences required in the labor market (priority Axis 3). In addition, a number of potential pilot initiatives are provided as examples which illustrate how investment can foster smart specialization in the region. *These investment projects have not been appraised nor endorsed by the World Ban*k. This list should be considered as merely illustrative.

XII. **Overall, the policy instruments presented in this report constitute potential avenues for increasing the economic development of the region through enhancements in research, innovation and private sector competitiveness.** Whereas change in the structural features of competitiveness is a long-term goal, targeted policy interventions and local investments can support the West Region in developing an integrated smart specialization strategy and in concentrating resources in the most promising areas of comparative advantage. In this way, policy makers can address some of the main bottlenecks faced by firms and entrepreneurs and may help unlock the competitive and innovative potential of the West Region's economy**.**

I. Introduction

1. **In 2010, the Europe 2020 Strategy was launched as the European Union's ten-year growth strategy which is built on three main objectives: "smart growth", "sustainable growth" and "inclusive growth".**

2. **Following this approach, Member States have been encouraged to define smart specialization policies with the goal of increasing the knowledge content and value added of existing production in industries where comparative advantages exist.** Smart specialization policies should follow a knowledge-driven approach to economic growth that: builds on existing comparative advantages; helps develop new activities in places where a strong comparative advantage might arise; and promotes a larger contribution of the knowledge factor to economic growth.[2]

3. **Against this backdrop, this report constitutes the final part of the assessment conducted under the "Romania West Region Competitiveness Enhancement and Smart Specialization" task.** The main objective of this project was 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.

4. **Six intermediate reports were already delivered under this task**; including: i) Trade Outcomes Assessment; ii) Territorial Assessment: Profile, Performance, and Drivers of Growth; iii) Economic Geography Assessment: Territorial Development Challenges; iv) Trade and Transport Facilitation and Logistics Infrastructure Assessment; v) Competitiveness of West Romania Firms: Diagnostics, Challenges, and Opportunities; and vi) Smart Specialization Case Studies Report

5. **The first five reports drew on complementary methodological approaches and intended to perform a complete competitiveness mapping of goods and services producers in the West region.** The five reports: i) assessed the recent trade performance of the West Region; ii) evaluated the overall competitiveness of West Romania firms; iii) evaluated the linkages between economic activity, trade and location in order to identify the challenges of further developing and industrializing the region iv) carried out a qualitative analysis of factors that shape the economic development of the region; and, v) assessed the logistics and transport infrastructure of the country and the region in particular.

6. **The sixth report followed a sector-level approach and evaluated the economic specialization of the West Region of Romania** in order to enable a richer understanding of sector-specific contexts and to identify activities for which the region presents comparative advantage. By focusing on particular sectors that have a considerable weight in the regional economy (automotive, textiles, agro-food, ICT, construction, and tourism), the sixth report had three complementary objectives: i) provide a critical overview of the strengths and weaknesses of the sector's productive system; ii) investigate the capacity of firms to adopt new technologies, taking into account the available skills composition, sector-specific regulatory restrictions, access to finance; and iii) identify smart specialization niches within the target sectors, as well as the opportunities arising at the level of business and research and technological development infrastructure (RTDI) co-operation, as a way to detect the growth opportunities that lie

[2] According to European Commission, smart specialization means identifying the unique characteristics and assets of each country and region, highlighting each region's competitive advantages, and rallying regional stakeholders and resources around an excellence-driven vision of their future. It also means strengthening regional innovation systems, maximizing knowledge flows and spreading the benefits of innovation throughout the entire regional economy. (http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/smart_specialisation_en.pdf).

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ahead in these industries. Based on available information in the market, the report concluded that the region has apparent comparative advantage in focusing on automotive, textiles and ICT, while agri-food and tourism were classified as sectors with latent comparative advantage. Finally, the construction sector was classified as a sector with unclear comparative advantage.

7. **Building on these previous assessments, the current report presents the key elements for a smart specialization strategy. It follows the format and the overall guidelines for the design of the instruments to be financed in the 2014-2020 programming period from EU structural funds and other sources.** It uses a three-step sequential approach according to the guidelines of the European Commission. First, it defines the thematic objectives (TOs), as established by the Cohesion Policy. Second, it sets investment priorities that are tailored to the particular needs of the local industries and can be promoted based on the regional initiatives. Third, it proposes a number of specific investment projects. While presenting directions for increasing the economic development of the region based on research, innovation and private sector competitiveness, the report also includes recommendations for improving areas which have an indirect influence on regional competitiveness enhancement and smart specialization, such as education, transport and urban development. In addition, a list of potential pilot initiatives is provided as examples which illustrate how investment can foster smart specialization in the region.

8. **The report is structured in five chapters following this introduction**. Chapter 2 presents the overall context of the Europe 2020 strategy along with a short description of the smart specialization approach, which forms the basis of the sector-level assessment. Drawing on the comprehensive competitiveness analysis conducted by the first five reports under this project, Chapter 3 presents the key strengths and challenges that have shaped the economic evolution of the region. Building on the Smart Specialization Case Studies Report, Chapter 4 draws on the sixth report under this task while summarizing the evaluation of the economic specialization of the West Region of Romania following a sectoral approach. This chapter summarizes the potential smart specialization niches within target industries and identifies general areas for policy action. Chapter 5 provides specific policy recommendations that can serve as building blocks for the development of a regional smart specialization strategy for the 2014-2020 period. Chapter 6 concludes.

II. Smart specialization in the context of the Europe 2020 Strategy and the European Cohesion Policy

9. **In 2010, the Europe 2020 Strategy was launched as the European Union's ten-year growth strategy, built on three main objectives: "smart growth", "sustainable growth" and "inclusive growth".** As the cornerstone of all EU policies and programmes, the Strategy is intended to act as an organizing framework under which all EU policies will operate over the coming decade and aims to tackle both the structural weaknesses in Europe's economy exposed by the crisis, as well as long term challenges, such as globalization, pressure on natural resources and an ageing population.

10. **To render Europe 2020 objectives more tangible, five key targets have been set for the Member States to be achieved by the end of the decade, covering: employment, education, research and innovation, social inclusion and poverty reduction, and climate/energy.** Each EU country has adopted its own national targets in each of these areas. The concrete actions at EU and national level that can help ignite new engines of growth and jobs are envisioned under seven "flagship initiatives": "Innovation Union", "Youth on the move", "A digital agenda for Europe" (smart growth), "Resource-efficient Europe", "An industrial policy for the globalization era" (sustainable growth), "An agenda for new skills and jobs", "European platform against poverty" (inclusive growth).

11. **Romanian targets for 2020 are presented in the following table**. As the national authorities did not establish regional contributions to the national targets according to regional disparities, each region can decide to fulfill the same level of the indicators. Nevertheless, more advanced regions such as Bucharest- Ilfov or the West region could reach these indicators more easily than others. In order to support the national commitment it is desirable that regions with high development potential and stronger higher education structures and R&D bodies take the necessary measures to surpass the national targets, at least those related to employment, R&D, and emissions and energy.

Table 1: The national Europe 2020 targets

	Employment rate (%)	R&D (% of GDP)	Emissions reduction (compared to 2005) (%)	Renewable Energy (%)	Energy efficiency reduction (%)	Early school leaving (%)	Tertiary education (%)	Reduction of population at risk of poverty or social excl.(no. of persons)
EU target	75	3	20	20	20	10	40	20,000,000
RO target	70	2	19	24	19	11,3	26,7	580,000
RO current[3] situation	63,8	0,48	51,85	20,79	16,6	17,4	21,8	240,000
West-region current situation	52.5[4]	0.22[5]	-	-	-	-	15.4[6]	-
West-region target	70	2	19	24	19	11,3	26,7	-

II.1. Smart specialization within the Europe 2020 Strategy, the European Cohesion Policy and the 2014-2020 programming period

12. **Smart specialization has been highlighted by the European Commission as a central pillar of the Europe 2020 Strategy[7].** A smart specialization strategy is a multi-annual framework aimed at developing a well-performing national or regional research and innovation system. It aims to define a policy mix and a budgetary framework which focus on a limited number of priorities targeted at stimulating smart growth. The strategy should be built on analysis of all the assets in a region, innovation strengths and weaknesses and emerging opportunities and market developments, as a way to identify the existing and potential competitive advantages in comparison with other regions. In order to become operational and effective, this strategy needs to be underpinned by a strong partnership between business, public entities and knowledge institutions (universities and research institutes) working together to identify not only a region's most promising areas of specialization, but also the weaknesses that hamper innovation. It must include mechanisms for policy learning, in particular through peer reviews involving public officials, practitioners and regional stakeholders. The goal of this approach is to avoid unnecessary duplication and fragmentation of efforts, and to exploit opportunities for joint programming, transnational cooperation and joint leverage of EU instruments.

13. **To reach the Europe 2020 objective of smart, sustainable and, inclusive growth, the full innovation potential of all EU regions needs to be activated.** To achieve this, innovation efforts are important for all types of regions, from the most developed to those that are far from the technological frontier. Therefore, to the extent that the capacity of Member States and regions to achieve smart,

[3] The data refers to 2011 indicators
[4] Economic activity rate (2011); Source: Eurostat
[5] Data for 2010; Source: Eurostat
[6] Persons aged 25-64 with tertiary education attainment (%); Source: Eurostat
[7] Europe 2020 Flagship Initiative Innovation Union [COM(2010)546]

sustainable and inclusive growth depends on their specific development potential and their assets (in terms of human, physical and natural capital, knowledge, institutions and networks), the design of the policy mix must be built on regional diversity. This will allow it to be in line with the innovation capacity of regions and directed towards meeting local needs. All regions can gain from adopting a policy mix that develops their strengths and tackles their weaknesses, whether through knowledge generation or through its diffusion and adoption, including the adaptation of generic technologies for specific market niches. In this sense, regional policy - through an integrated territorial approach that encourages regional cooperation and improves synergies with Community policies for research, innovation and education - can speed up smart growth across the EU.

14. **Developing smart specialization strategies requires Member States and regions to concentrate resources on the most promising areas of competitive advantage** based on clusters, cross-sectoral activities, eco-innovation, innovative services, high value-added markets or specific research and innovation areas. Such a strategy would help avoid duplication, increasing uniformity and lack of imagination and vision in setting research and innovation priorities, which in turn would diminish the potential for complementarities within the EU knowledge base. To have the most impact, R&D and innovation resources need to reach a critical mass and to be accompanied by measures to increase skills, education levels and knowledge infrastructure. Regions are an indispensable part of the Europe 2020 strategy, as they are the primary institutional partners for universities, other research and education institutes, and SMEs.

15. **In its Communication *Regional Policy Contributing to Smart Growth in Europe*[8] the Commission provides suggestions related to the key concepts that need to be presented in a smart specialization strategy.** Namely:

a) *Innovation clusters for regional growth*. Clusters provide a favorable environment to foster competitiveness and drive innovation. Support for cluster development has to be concentrated on areas of comparative advantage.

b) *Innovation-friendly business environments for SMEs, R&D intensive ones especially*, and the *creation of new firms*. There is a need to make more extensive use of loans, equity finance and other forms of financial engineering.

c) *Lifelong learning in research and innovation.* Focusing school, vocational and higher education curricula on transversal competences like creativity, entrepreneurship and initiative will help young people to develop their full potential for innovation.

d) *Attractive regional research infrastructure and centers of competence* is central to knowledge-based innovation systems.

e) *Creativity and cultural industries* can help to boost local economies, stimulate new activities, create new and sustainable jobs, have important spill-over effects on other industries and enhance the attractiveness of regions and cities

f) *Digital Agenda,* that aims to deliver sustainable economic and social benefits from a digital single market based on fast internet applications and to liberalize access to content on line.

g) *Public procurement.* Innovative public procurement means the public sector can take on the role and risks of a lead customer, while improving the quality of its services and productivity.

[8] [COM(2010)553]

h) *Regional Policy addressing the grand challenges* (such as climate change, energy and resource efficiency, raw material scarcity and demographic ageing) through European Innovation Partnerships

16. **In line with the long term Europe 2020 goals of smart, sustainable and inclusive growth, the EU has adopted a legislative package which frames the Cohesion Policy for 2014-2020 period.** This policy provides a framework for financing a wide range of projects and investments with the aim of encouraging economic growth in EU Member States and their regions.

17. **The Cohesion Policy follows three main drivers. First, it defines a framework for dialogue between the European Commission and the Member States.** Two main programming documents are then envisaged: the Partnership Agreement and Operational Programmes. In this regard, each Member State needs to prepare a Partnership Agreement outlining funding priorities which will help it achieve its national targets and contribute to smart, sustainable and inclusive growth in the EU as a whole by 2020. In addition, Member States and regions need to define the operational programs which set out a strategy for the contribution to the Europe 2020 Strategy, consistent with the Common Strategic Framework[9] and Partnership Agreement. Each operational program shall define priorities setting out specific objectives, financial appropriations of support from the ESI Funds and corresponding national co-financing.

18. **Second, it harmonizes the rules related to different European Funds, defined as European Structural Investment (ESI) funds for 2014-2020**, which encompasses European Regional Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund (CF), the European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF). This approach of harmonization of programming processes allows for better combination of funds for stronger impact and coherence of EU action.

19. **Third, as a way to concentrate resources on the goals of the Europe 2020 Strategy, the Cohesion Policy defines a set of thematic objectives (TOs) to which the ESI funds will contribute.** These TOs provide a menu of possible funding objectives for the whole of the EU and are listed as follows:

1. *strengthening research, technological development and innovation;*
2. *enhancing access to, and use and quality of, information and communication technologies;*
3. *enhancing the competitiveness of small and medium-sized enterprises, the agricultural sector (for the EAFRD) and the fisheries and aquaculture sector (for the EMFF);*
4. *supporting the shift towards a low-carbon economy in all sectors;*
5. *promoting climate change adaptation, risk prevention and management;*
6. *protecting the environment and promoting resource efficiency;*
7. *promoting sustainable transport and removing bottlenecks in key network infrastructures;*
8. *promoting employment and supporting labor mobility;*

[9] In order to promote the harmonious, balanced and sustainable development of the Union, the Common Strategic Framework provides strategic orientation to the programming process and to the facilitation of the sectoral and territorial coordination of Union intervention under the ESI Funds and with other relevant Union policies and instruments in line with the objectives and targets of the Union strategy for smart, sustainable and inclusive growth taking into account the key territorial challenges for different types of territories.

9. *promoting social inclusion and combating poverty;*

10. *investing in education, skills and lifelong learning;*

11. *enhancing institutional capacity and an efficient public administration.*[10]

20. **According to European Commission guidelines, the thematic objectives should be selected and presented in relation to the funding priorities**[11]- which are established at national level and correspond to the main challenges that each country faces and should tackle with the help of EU funding - **and are to be translated into specific investment priorities**[12]**set out according to the ESI Funds specific rules.**

21. **As part of the Cohesion Policy for the 2014-2020 programming period, smart specialization has been proposed as "ex-ante conditionality".** This means that every Member State and/or region will need to have a well-developed strategy in place to be eligible for EU financial support through the ESI funds for their planned innovation measures. This conditionality applies specifically for two of the 11 thematic objectives[13]: (i) strengthening research, technological development and innovation (TO 1) and (ii) enhancing access to and use of quality of ICT (TO2). According to the latest version of the regulation for cohesion policy, strengthening research, technological development and innovation can to be achieved mainly through the following investment priorities under TO1: i) promoting business investment in innovation and research; ii)developing links and synergies between enterprises, R&D centers and higher education, in particular product and service development, technology transfer, social innovation and public service applications, and demand stimulation; and, iii)networking, clusters and open innovation through smart specialization. In practice, there is a strong link between the TO1 and increase of competitiveness of SMEs (TO3). Promoting investments under TO3 is crucial in order to enhance the results achieved under TO1.

22. **Against the Cohesion Policy backdrop, the European Commission has recently sent position papers to the Member State authorities with preliminary views and guidelines for the development of the Partnership Agreement and programs for the period 2014-2020.** According to these papers, the Member States are advised to concentrate their intervention in three to five funding priorities. Among the available funding priorities, one of the most important for all the Member States is related to innovation, smart specialization, business development and increase in the level of competitiveness.

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[10] In this respect, the thematic objectives have been designed in order to achieve the three types of growth identified by Europe 2020 Strategy, as follows: TO 1-3 and TO 10 contribute to the smart growth, TO 4-6 contribute to promote a sustainable growth, while TO 8 and 9 ensure an inclusive growth. The horizontal TO11 is essential for underpinning the investments promoted under the remaining TOs.

[11] For Romania, the European Commission proposed through the recent Position Paper (Ref. Ares(2012)1240252 - 19/10/2012), with the of the Commission on the priorities that Romania should concentrate the financing, five *funding priorities* in direct relation with the main challenges the Romania faces: 1. *Improving human capital through higher employment, and better social inclusion and education policies*, 2.*Developing modern infrastructure for growth and jobs*, 3. *Promoting economic competitiveness and local development*, 4. *Optimizing the use and protection of natural resources and assets*, 5. *Modernization and reinforcement of the national administration and of the judiciary*. They do not represent a menu for all Member States, but they are more or less similar.

[12] Investment priorities set out detailed objectives, which are not mutually exclusive, to which the funds shall contribute. These investment priorities should form the basis for the definition of specific objectives within programs.

[13]According to the Annex V of the draft General Regulation (http://ec.europa.eu/ regional policy/what/future /proposals 2014 2020 en.cfm#1), a "national or regional research and innovation strategic policy framework for smart specialization" is required for TO 1, and "a strategic policy framework for digital growth, *for instance, within the national or regional innovation strategic policy framework for smart specialization* is in place" is required for TO2.

23. **Following the EU regulation, many Member States and regions are currently elaborating and drafting their smart specialization strategies.** National and regional research and innovation strategies for smart specialization are integrated, place-based economic transformation agendas that focus policy support and investments on key national or regional priorities, challenges, and needs for knowledge-based development. These agendas build on each country or region`s strengths, competitive advantages and potential for excellence. Smart Specialization Strategies support technological as well as practice-based innovation and aim to stimulate private sector investment. These policies, which are evidence-based and include sound monitoring and evaluation systems, aim to fully involve all relevant stakeholders and encourage innovation and experimentation.

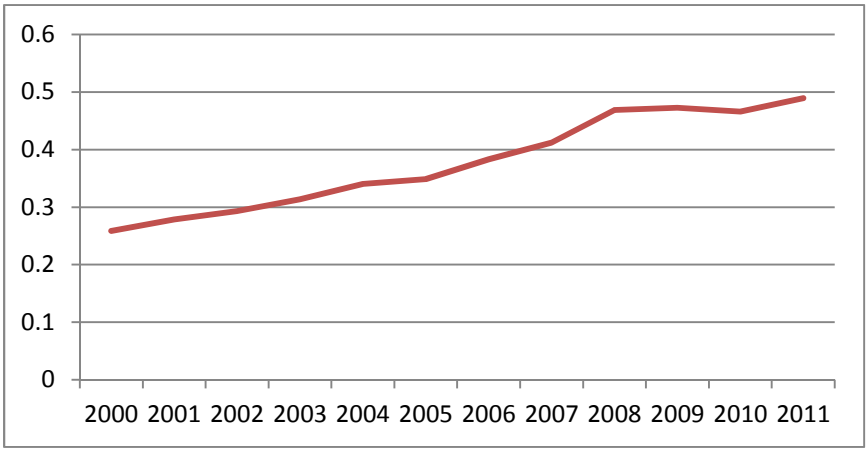
24. **In Romania, the authorities have decided to promote a National Smart Specialization Strategy, as part of the National Strategy for Research, Development and Innovation.** The methodology of this exercise is built on the EU Guidelines for smart specialization strategies. The Strategy will define a policy mix focusing on a limited number of priorities starting from the analysis of the research and innovation-based growth potential, taking into account the existing sectorial strategies (e.g. Health National Strategy or National Digital Agenda), and using modern forecasting methods. The research and innovation vision for 2020 proposes a focus on competitiveness, by placing innovation at the center of the research and development policy, as well as a commitment to global standards of excellence. Based on a strong partnership between businesses, public entities and knowledge institutions, the national smart specialization strategy will contain a mechanism for monitoring and evaluation.

25. **The decision to have a national approach for the development of a smart specialization strategy is primarily based on the fact that there are no administrative structures at regional level and consequently, no dedicated financial means at regional level for implementing this type of strategy, under the current administrative organization.** In addition, the research and innovation policy is designed and implemented at national level. However, some regions that have had a good experience in drafting and implementing strategies for research and innovation, as is the case of the West Region, are opting to develop regional strategies for smart specialization. These regional strategies can be used to advance local needs and priorities at the national level, and to support discussions with decision makers at county level and with potential investors.

III. Key strenghts and challenges of West region economy

26. **In the run up to the EU accession, the Romanian economy experienced healthy rates of growth in incomes.** This process was driven by the increasing integration of the Romanian economy with the EU Single Market, which, despite significant progress, is still below the average of other new Member States. Following the post-transition recession, in the 2000's the country's economic expansion was fuelled by unrestrained access to EU capital and product markets, which allowed Romanian firms to expand domestically and abroad, and opened the door to FDI inflows. As a result, the Romanian economy experienced growth averaging 6.5 % per annum and saw GDP per capita rise from 26% of the EU average to 49 % between 2000 and 2011 (Figure 1).

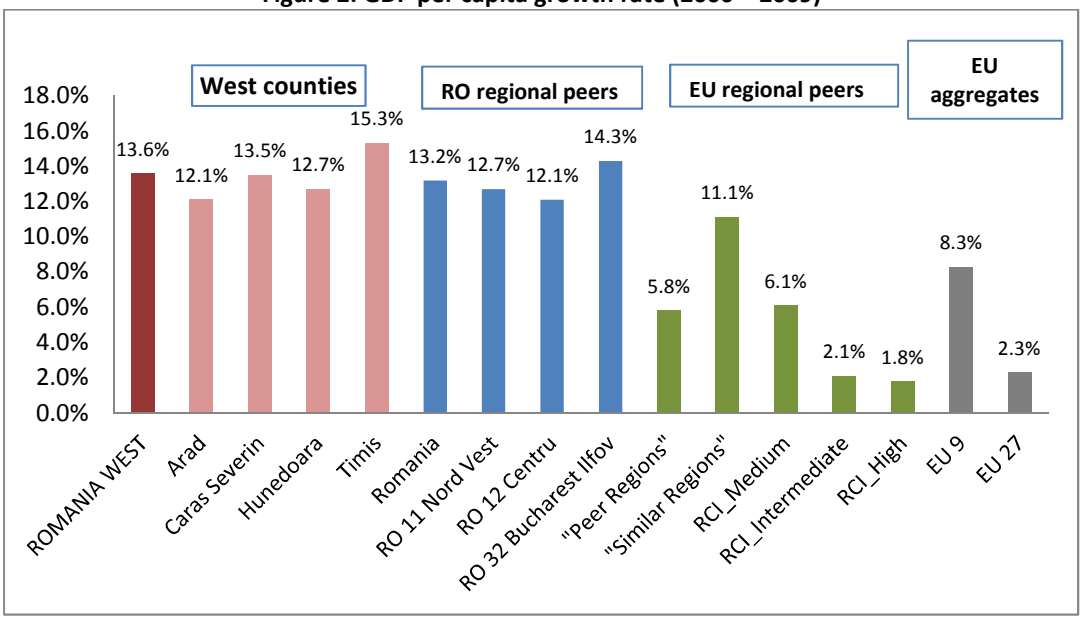
Figure 1: Romania's GDP per capita as % of EU average (PPP, current international $)



Source: WB staff calculations based on WDI data

27. **During this period, the convergence process has trickled down at the regional level, and the West region has emerged as a leading region in Romania,** growing faster than all national comparator regions with the exception of Bucharest (Figure 2). Although the region has a per capita GDP that is 13 percent higher than the national average, there is still considerable catch up to be done before reaching EU averages.

Figure 2: GDP per capita growth rate (2000 – 2009)



Source: World Bank staff calculations based on Eurostat data; "Peer regions": aggregate peers as defined by ADR Vest PL 41, 42, 43, 51, 52; HU 21, 22, 23, CZ 02, 03, 04; "Similar Regions": aggregate regions based on 10 European regions with most similar economic structure (as per 2010 'Beyond Ourselves' regional study): RO 11, 12, 22, 31, 44; BG 34, 42; SK 03, 04; CZ 06; "RCI": aggregates as per their classification in the European Regional Competitiveness Index – West Region classified as 'Medium'' **Note: EU 9 aggregates the 10 new member states excluding Romania.

28. **This rapid growth also translated into rising living standards in the region, through growth in real wages.** Over the decade the West experienced faster growth in wages than all peer regions, including Bucharest. The average compensation per worker in the West Region grew by 13 percent annually between 2000 and 2009 versus 12.2 percent for Romania as a whole and less than 11 percent for a set of similar regions in Europe; wage growth in the West was more than 5.5 times the EU-27 average.[14]

29. **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 must improve the value addition and innovation of its firms.** In order to shift its focus to higher value added activities and accelerate convergence, the region needs to identify strategies to achieve sustainable and inclusive growth. The first five reports under this task have provided a complete competitiveness mapping of services and goods producers in the West Region. The results that have emerged from this analysis have helped delineate the economic profile of the region and have pointed specific strengths and opportunities, as well as a number of challenges that need to be addressed as part of an effective development strategy for the region.

III.1. Main strengths

The physical endowments of the region are reasonably plentiful (and unexploited to some extent).

30. **The Banat Plain, which makes up the western half of the West Region, includes rich agricultural land that has supported diverse agricultural activities, including cereals, horticulture, and**

[14] Data Source: Eurostat

animal production. However, the share of the region's land area that is utilized for agriculture is the lowest among all regions in Romania[15]. This is partly a function of the topography of the region, but may also reflect the fact that, since EU accession, investors (mainly foreign) have purchased significant tracts of agricultural land, particularly in the western and southern parts of Timis County, much of which is not under cultivation.

31. **The mountainous eastern and southern portions of the region once held substantial reserves of coal, particularly around the Jiu Valley at the southern end of Hunedoara County, which fuelled the development of the mining and metallurgy industries in Hunedoara and Caras-Severin.** This was complemented by non-ferrous minerals, further north around Brad (Turnock, 2001)[16]. While mining remains important in the region today, the remaining coal pits struggle to stay economically viable.

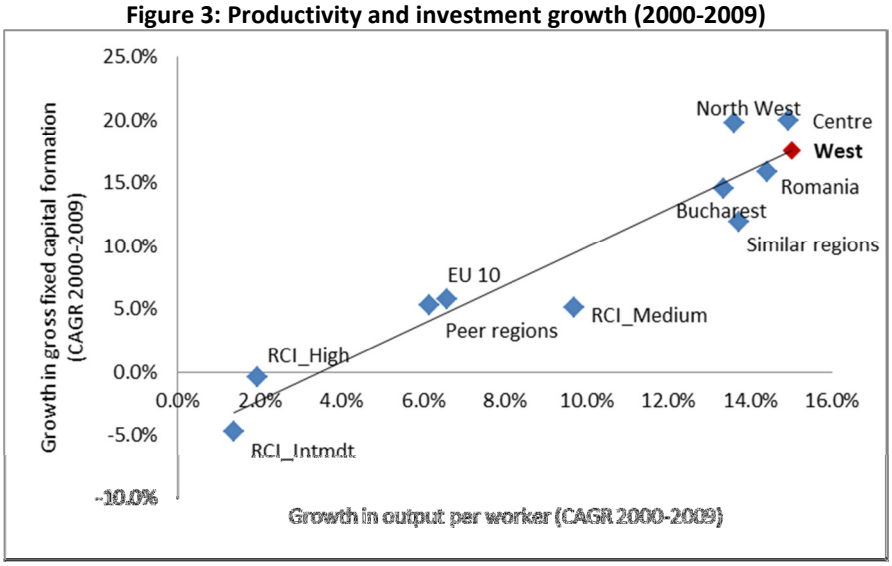
32. **Natural endowments underpin the region's industrial and commercial base, which contributed to the creation of infrastructural endowments from which the region benefits today.** For example, ironworks, which developed in Resita out of the coal sector as early as the late 18th century (Turnock, 2001), facilitated industrialization throughout Banat, establishing the engineering and metal industries. This is partly responsible for the establishment in the West Region of one the densest rail networks in the country. And combined with the competitiveness of the agricultural sector to the West, it helped facilitate the development of urban centers like Timisoara and Arad.

The region has experienced rapid economic growth which has delivered rising real wages, supported by commensurate improvements in productivity.

33. **The rise in wages has been supported by commensurate improvements in productivity.** Indeed, the significant GDP per capita convergence of the West (and of Romania as a whole) toward the EU average has been a function of rapid productivity catch-up, which in turn has been driven by strong investment. Over the previous decade, the West experienced the highest growth in output per worker among the comparator regions, coinciding with one of the highest levels of growth in gross fixed capital formation (Figure 3).[17] Despite this, in 2009 fixed capital stock per worker in the West stood at only 57% of the EU average and output per worker was still only one quarter of the EU average. This suggests that substantial scope remains for further productivity improvements, and thus continued high economic growth.

[15] Source: Eurostat; calculated as the ratio of "utilized agricultural area (UAA)" to "total area", 2009.
[16] Turnock, D. (2001). Growth Potential in Romania's West Region. *Geographica Pannonica, 4*, 5-13.
[17] It is worth noting at this stage that productivity growth is *not* assumed to be determined only by investments in machinery. Productivity gains are the result of multifaceted and medium-term strategies that cannot be reduced to incentives for the acquisition of new equipment.

Figure 3: Productivity and investment growth (2000-2009)



Source: Calculations based on data from Eurostat: Gross fixed capital formation by NUTS 2 regions [nama_r_e2gfcf]; Employment (in 1000 persons) by NUTS 3 regions (nama_r_e3empl95); Gross value added at basic pricesby NUTS 3 regions (nama_r_e3vabp95)

34. **Substantial productivity gains help to explain why the region experienced growth that was not only jobless but actually coincided with significant declines in overall regional employment**. But it does not help explain how falling employment levels could coincide with a very tight regional labor market. Table 3 highlights the West's low unemployment rate (along with North West and Bucharest) relative to European peers, as well as its fall in employment levels. While the comparator group of similar regions also experienced strong decline in employment levels over this period, this process came along with a high and growing unemployment rate, at more than twice the level of the West.

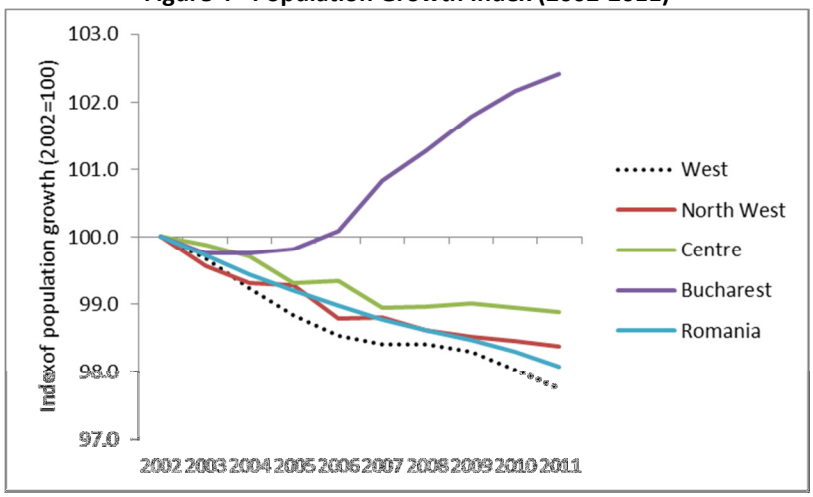
Table 2: Unemployment rates (ages 15 and over) and growth rates of employment (ages 15-64), 2000-2011

	Unemployment rate			Employment Growth (CAGR)		
	2000	**2007**	**2011**	**2000-07**	**2007-11**	**2000-11**
West	7.6	5.6	5.7	-0.8%	-0.7%	-0.7%
Nord-Vest	7.0	4.3	5.2	-1.7%	-1.6%	-0.8%
Centru	7.4	8.5	11.1	-1.7%	-0.2%	-1.7%
Bucuresti - Ilfov	6.6	4.1	5.4	0.9%	-1.3%	0.9%
Romania	7.0	6.4	7.4	-1.4%	-0.2%	-1.0%
"Peer Regions"	12.0	8.0	9.2	0.3%	-0.2%	0.3%
"Similar Regions"	12.2	8.4	11.0	-0.9%	-0.3%	-0.9%
RCI_Medium	13.2	8.9	12.1	0.7%	-0.5%	0.3%
RCI_Intermediate	10.3	8.4	11.3	2.5%	-0.7%	1.4%
RCI_High	5.7	5.5	7.1	1.8%	-0.3%	1.1%
EU 10	12.4	6.7	11.1	0.5%	0.2%	0.3%
EU27	9.2	7.2	9.6	1.2%	0.0%	0.7%

Source: Eurostat: "Unemployment rates by sex, age and NUTS 3 regions (%) [lfst_r_lfu3rt]"; "Employment by sex, age and NUTS 2 regions (1 000) [lfst_r_lfe2emp]"

35. **In addition, demographic and migration trends also help to understand falling employment levels despite increases in productivity and low rates of unemployment.** As is the case in Romania as a whole, the population of the West Region has been in decline for more than a decade. Between 2002 and 2011, the region lost more than 44,000 people, or 2.3 percent of the population. This decline was faster than the Romanian average, and faster than its peers. Only three other regions – South West Oltenia, South Muntenia, and South East – experienced equal or greater population decline over this period. But this picture of aggregate decline is not as straightforward as it appears. First, the declining population in the West region is really a story of significant decline in lagging counties of Caras-Severin and, particularly, Hunedoara. In fact, Timis has been experiencing growth on par with Bucharest, and Arad's rate of decline is slightly below the national average. Second, it is not primarily a story of migration. Rather it is one of structural change – specifically a lower birth rate. In this regard the population dynamics of the West Region are similar to the national-level trends. But even in this case, there are some specific regional differences. The right hand graph in Figure 5 shows the West region growing slightly above the national rate in terms of working age population, but well below it in terms of the population under the age of 15, and also over the age of 65. This has implications for the future labor market, unless the region manages to become a major destination for internal migration. [18]

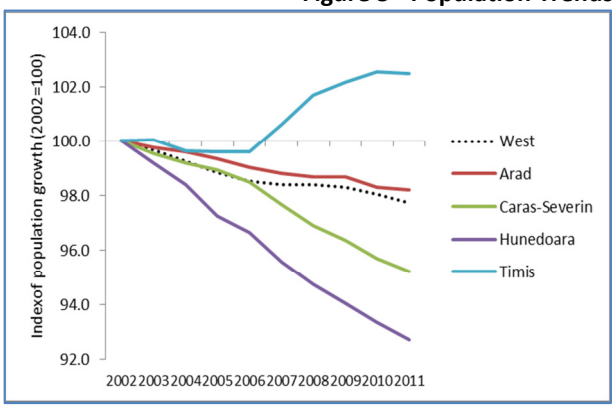
Figure 4 - Population Growth Index (2002-2011)

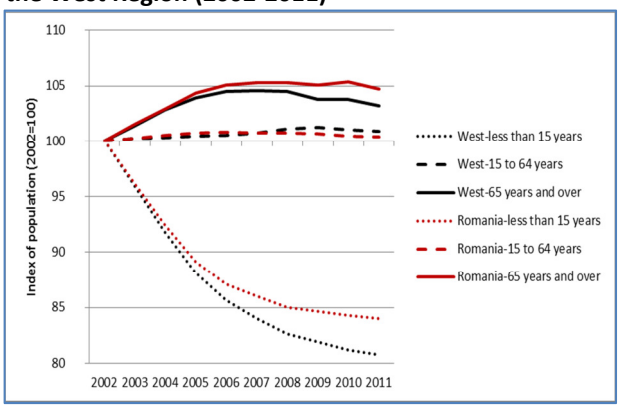


Source: Calculations based on data from Eurostat: Population on 1 January by broad age groups and sex - NUTS 3 regions [demo_r_pjanaggr3]

[18] The West is also the only region outside of Bucharest with a significantly high ratio of female to male population of working (and also childbearing age) – the ratio is above the Romanian average in all counties but Caras-Severin, but especially driven by Timis, where there are 4 percent more women than men of working age.

Figure 5 - Population Trends in the West Region (2002-2011)



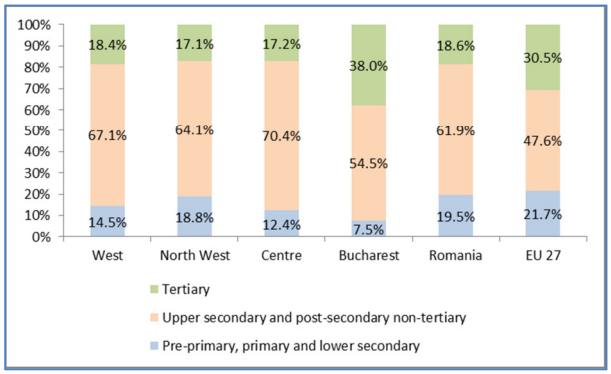


Source: Calculations based on data from Eurostat: Population on 1 January by broad age groups and sex - NUTS 3 regions [demo_r_pjanaggr3]

The region has a relatively highly skilled population

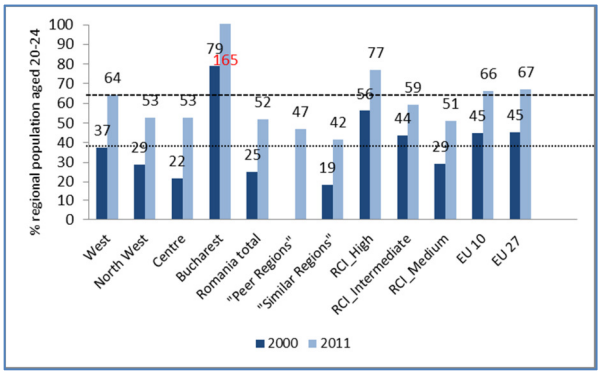
36. **The West Region is considered to have a relatively highly skilled population, due in part to the prominence of its universities.** There are seven public universities in the West Region, out of which four are based in Timisoara, one in Arad, one in Petrosani, one in Resita, and Politehnica University has a branch in Hunedoara . In addition, there are seven private universities, which are located in Timisoara, Lugoj, Deva and Arad. Specialization areas of these higher education institutions vary, but the region is particularly strong in natural sciences, mathematics, computer science, food engineering, agriculture, medical and veterinary sciences. Figure 6 confirms that the educational attainment of the region's economically active population is slightly higher than in peer regions. It also has a higher share of the population with a tertiary education than any other region outside of Bucharest, although it still trails far behind the capital on this measure, and well behind European averages. Among the population of 20-24 years of age (Figure 7) the West far outperforms most peers in university enrollment, although it is striking just how strong of a magnet Bucharest has become for the country's university population. In a European context, over the past decade the West has virtually eliminated its gap with the EU in terms of tertiary enrolment. This suggests that over the next generation, the average education level of the region's workforce will converge with Europe.

Figure 6: Distribution of Economically Active Population (Aged 25-64) by Educational Attainment (2009



Source: Calculations based on data from Eurostat, [lfst_r_lfp2acedu]. Note: Economically active population by sex, age, highest level of education attained and NUTS 2 regions (1 000).

Figure 7: Students in Tertiary Education as share of Regional Population Aged 20-24 (2000 v 2011)



Source: Calculations based on data from Eurostat, [edat_lfse_13]. Note: Persons aged 25-64 and 20-24 with upper secondary or tertiary education attainment, by sex and NUTS 2 regions (from 2000 onwards) - %.

37. **The West Region is recognized as having a strong set of universities and hosts a large student population, particularly in Timisoara.** As Table 3 shows, the West is particularly well represented in terms of the number of tertiary institutions and faculties that it hosts. However, although it also has a fairly large population of students in the first stages of tertiary education, the West does not stand out as having any particular advantage over peer regions. What is very clear from Table 3 is that Bucharest is by far the main center of tertiary education in the country. Where the West's performance drops considerably is at the advanced stages of tertiary education**,** where the relative level of its research student population is only half that of that of North West and one quarter that of Bucharest. Taken together this suggests that the region is in a broadly good position in terms of producing (theoretically) trained workers for high skill professions, but may be less competitive at the higher end of research and innovation.

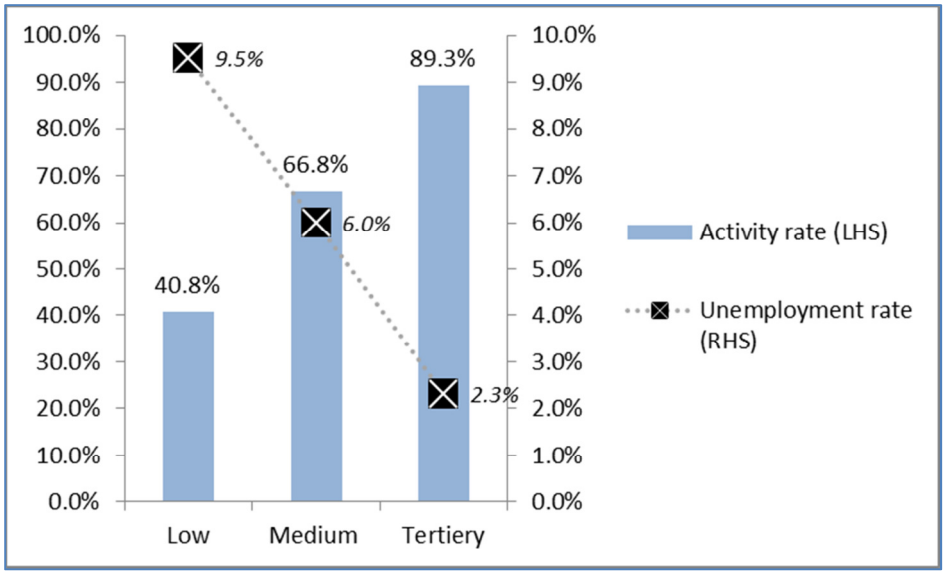
Table 3: Tertiary Education Infrastructure as of 2010

	Tertiary institutions		**Faculties**		**High skills students (level 5 A)**		**Advanced research students (level 6)**	
	Total	***per m population***	**Total**	***per m population***	**Total**	***per m population***	**Total**	***per m population***
West	**14**	**7.3**	**79**	**41.3**	**92,419**	**48,290**	**2,179**	**1,139**
North West	17	6.3	97	35.7	114,473	42,124	6,554	2,412
Centre	13	5.2	75	29.7	120,125	47,618	2,267	899
Bucharest	34	15	166	73.2	366,663	161,709	10,563	4,659
Romania Total	108	5	624	29.1	969,990	45,297	28,963	1,353

Sources: Institutions and Faculties from Institute of National Statistics; Student figures from Eurostat; "High skill students" defined as "First stage of tertiary education, programmes that are theoretically based/research preparatory or giving access to professions with high skills requirements(level 5A)"; "Advanced research student" defined as "Second stage of tertiary education leading to an advanced research qualification (level 6)"

38. **These trends in education follow through to the labor market, where the West has a comparative advantage in highly skilled workers** (proxied those with a tertiary education). Like much of Romania, however, the West faces a problem both with older workers retrenched due to restructuring of traditional industries like coal and metals (particularly impacting Hunedoara and Caras-Severin) as well as younger workers that leave school without qualifications. Participation rates among workers with the lowest education levels is less than half that of those at the highest(tertiary) levels in the West Region, while unemployment rates are almost four times higher (Figure 8). This is broadly in line with the experience of peer regions.

Figure 8: Economic Activity (Participation) and Unemployment by Level of Educational Attainment - West Region (2009)



Source: Calculations based on data from INS: Activity, employment and ILO unemployment rates, at territorial level, by educational level, by sex and area, in 2009 ; Note: Calculated for population aged 15 to 64

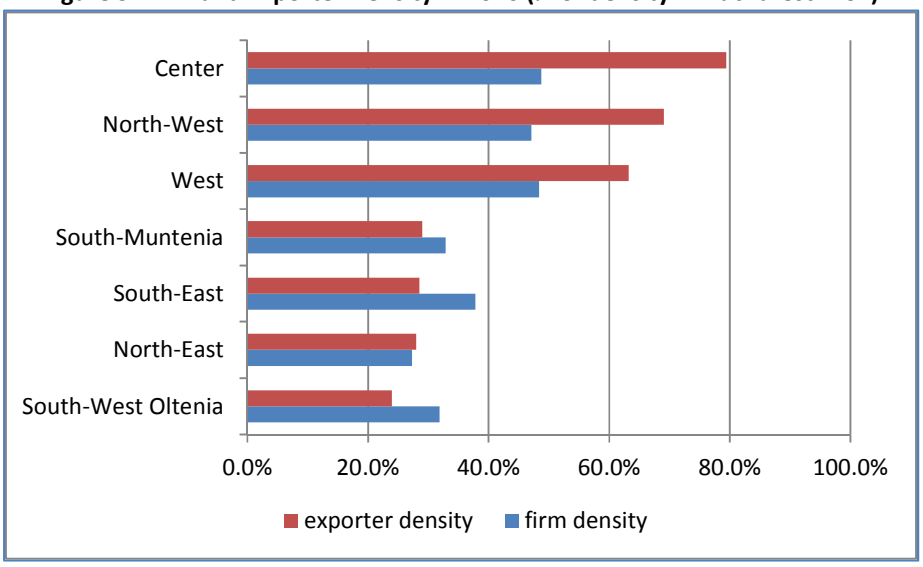
There are important signs of entrepreneurial activity in the West Region

39. **There are important signs of entrepreneurial activity.** The West Region is one of the most enterprise- and trade-dense regions in Romania. In 2010, it ranked third in number of firms per capita with 211.5 firms per 100,000 inhabitants – ranking only behind Bucharest-Ilfov (437.5) and Center (213.2). In addition, with 639 exporting firms active in 2010, the West Region had the third highest percentage of firms engaged in exporting in the country (15.7%)[19] and the fourth highest exporter density in Romania (33.3 exporters per 100,000 inhabitants). Yet, the gap compared to the leading region is still large. Figure 9 shows that exporter and firm density are less than seventy percent and fifty percent, respectively, of the density of exporter and firm density in the Bucharest-Ilfov region[20].

[19] Numbers are computed based on a sample of (headquarter) firms from SBS dataset. In 2010 the percentage of firms exporting per region were: Bucharest-Ilfov (12%), Center (19.6%), North-West (17.6%), West (15.7%), North-East (12.3%), South-Muntenia (10.6%), South-East (9.08%), and South-West Oltenia (9.04%).

[20] Bucharest-Ilfov is the leading region in terms of both firm and exporter *density* with 52.6 exporters and 437.5 firms per 100,000 inhabitants.

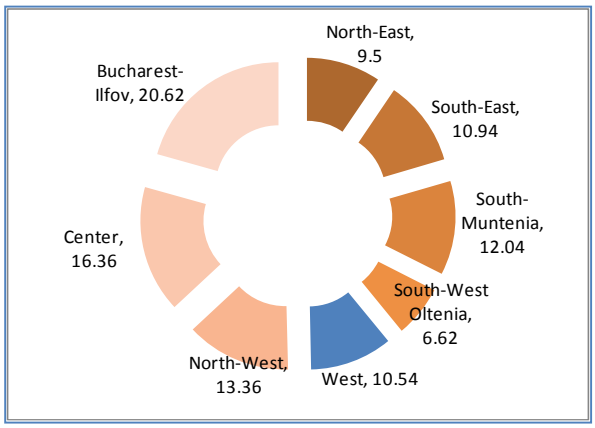
Figure 9: Firm and Exporter Density in 2010 (% of density in Bucharest-Ilfov)



Source: World Bank staff calculation based on SBS data

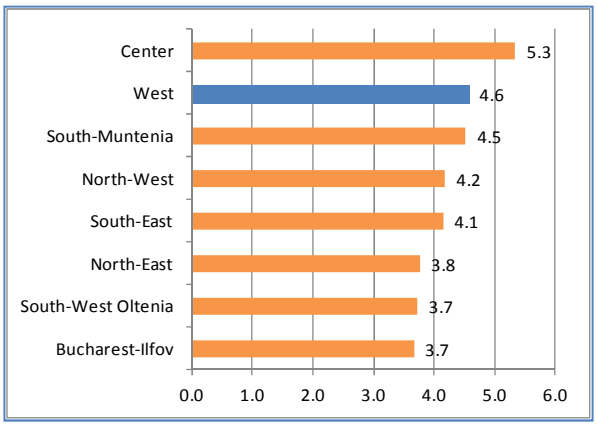
40. **Additionally, the West Region presents the second highest incidence of gazelles over total number of firms.** "Gazelles", firms with at least a 25% turnover growth for 3 or more years, are of particular interest both because of their contribution to employment and as an additional indicator of entrepreneurship. In 2010, the last year for which firm level data from SBS dataset are available, gazelles in Romania were mostly concentrated in the Bucharest-Ilfov, Center and North-Western regions (Figure 10). The West region is only the sixth main location for gazelles accounting for 10.5% of the gazelles in the country. However, in terms of percentage of gazelles over total number of firms, the West Region presents the second highest probability of having a gazelle (4.5%), while the Center region shows the highest probability with 5.3% (Figure 11).

Figure 10: Distribution of Gazelles in Romania By Region – Excluding SOEs (2010)



Source: World Bank staff calculation based on SBS data

Figure 11: Share of Gazelles Among All Firms (Excluding SOEs), by region (2010)

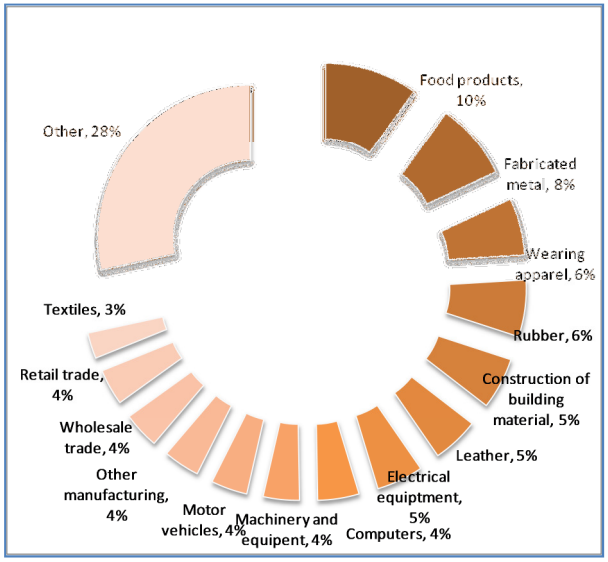


Source: World Bank staff calculation based on SBS data

41. **The sectoral specialization of the "gazelles" is slightly different than the distribution of firms overall.** While Western firms in general are mainly concentrated in service activities such as wholesale trade (14%), retail trade (10%), and construction of building material (5%), the gazelles are essentially specialized in manufacturing activities. Food products (10%); fabricated metal (8%), wearing apparel (6%), and manufacture of rubber (6%) are the sectors breeding the highest number of fast growing firms

(see Figure 12). This trend is slightly different from the other regions where the sectoral specialization of the gazelles mirrors the sectoral concentration of firms in general. In the case of Bucharest-Ilfov, both gazelles and overall firms are essentially specialized in service activities. Another important difference between the West Region and Bucharest-Ilfov is that gazelles in the latter are spread out across several sectors, suggesting that economic growth is likely to be more balanced, i.e. evenly spread among different parts of the economy.

Figure 12: Sector Distribution of Gazelles in the West Region (2010)



Source: World Bank staff calculation based on SBS data

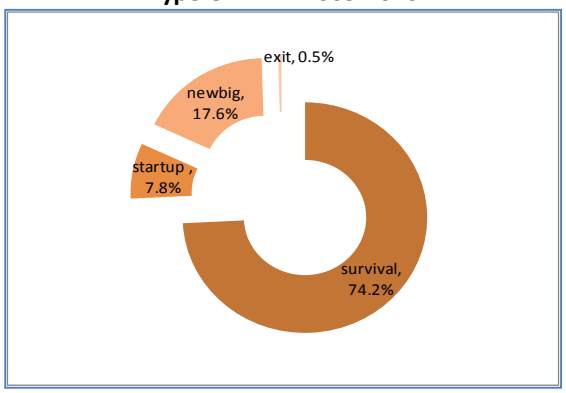
42. **The contribution of startups to productivity growth in West Romania is higher than the contribution of startups to productivity growth in Romania as a whole.** Figure 13 and Figure 14 show the contributions for each type of firm to productivity growth in the 2005-2010 period, for Romania as a whole and for the West Romania region, in particular.[21] The largest positive productivity growth contribution comes from surviving firms in both cases, while the whole entry effect (entry of "new big" and "startups") accounts for the second higher portion. However, the contribution of startups, i.e. firms that were born after 2005, is almost 3 percentage points higher in West Romania than in the country as a whole.[22] While the general proportion of contributions by group of firms is driven by the relative share of each group over the total of firms, some differences across regions surface (Figure 15). The "startups" group presents the highest contribution (10.4%) in the West region, while the "new big" entry share is the highest in the North West region. The market exit contribution is the highest in the Bucharest region, while in the West Region, as well as in the South-Western Oltenia, South Eastern and North

[21] Drawing on the World Bank report "Competitiveness of West Romania Firms: Diagnostics, Challenges and Opportunities" this exercise is based on the final sample of the SBS survey data – as after excluding for outliers – in which four groups of firms are identified: surviving firms (S); new "start-ups" (NSU), new "big-entries" (NBE) and exit firms (X). Considering the first and latest year of data (2005 and 2010) available in the SBS dataset, surviving firms are defined as those enterprises that are sampled in both years, while exiting firms are those sampled only in 2005. NBE (new "big entry") firms are those with a date of incorporation antecedent to 2005, but that were sampled only in the conditional 2010 SBS round. Finally, the new start-up enterprises (NSU) are those whose date of incorporation is more recent than 2005 and that was sampled only in the conditional 2010 SBS round.

[22] In principle, the fact that the newcomers are particularly successful in the West region might be explained by two main reasons. First, it can be a sector effect, reflecting the weight of high growing sectors in the West region. Second, it can be that externalities (public services, good suppliers, information flows, knowledge spillovers) are relatively better in the West region.

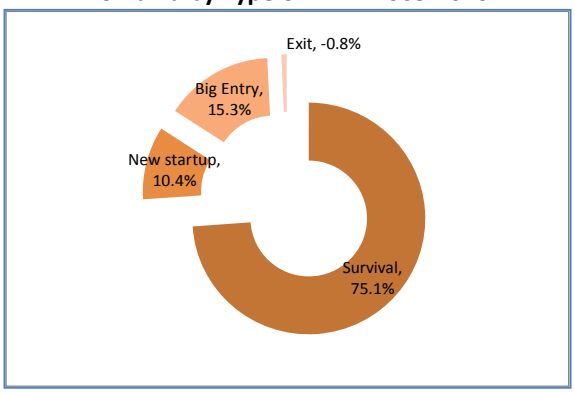
Eastern regions the contribution to TFP growth by exiters is negative. This suggests that in these regions, consolidation of the market has already taken place.

Figure 13:TFP Growth Decomposition in Romania By Type Of Firm: 2005-2010



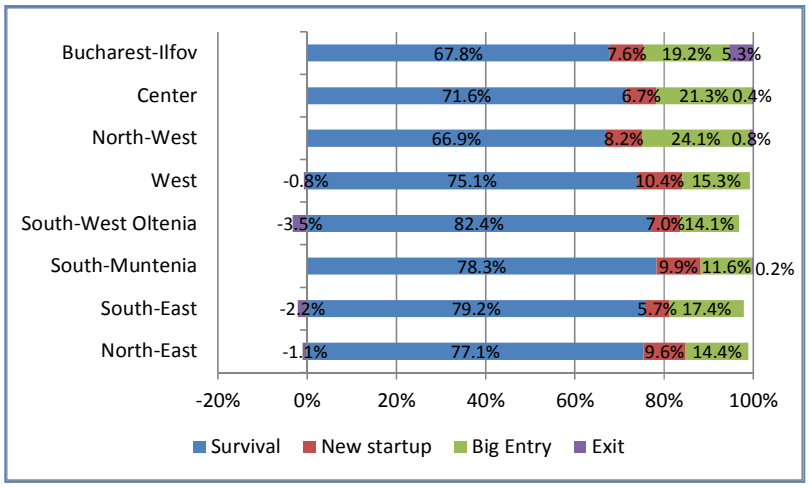
Source: World Bank staff calculation based on SBS data

Figure 14: TFP Growth Decomposition in West Romania by Type of Firm: 2005-2010



Source: World Bank staff calculation based on SBS data

Figure 15: TFP Growth Decomposition in Romania By Type of Firm And by Region: 2005-2010

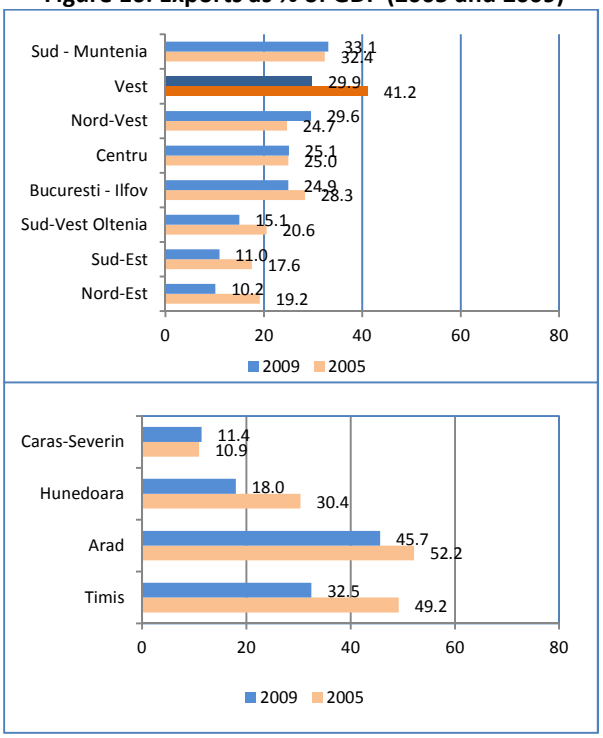


Source: World Bank staff calculation based on SBS data

The West Regions' export performance is very positive in overall terms

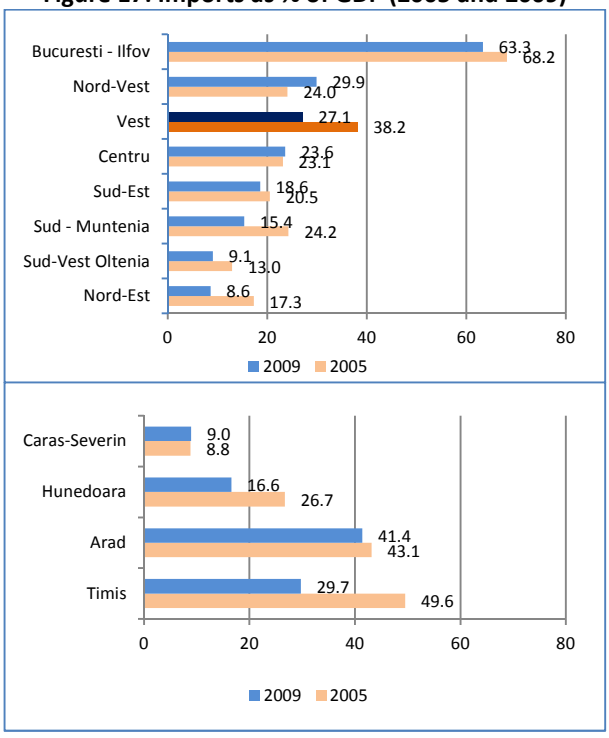
43. **With exports worth Lei 19 billion (or euro 4.5 billion) and imports worth Lei 17 billion (or euro 4.1 billion), the West Region is the second most export oriented and the third most import oriented in Romania.** In 2009 exports represented 29.9% of the GDP of the region and imports 27.1% (Figure 16 and Figure 17). However, the region also experienced the sharpest decline of trade dependence of all of Romania: in 2005, the share of GDP from exports was equal to 41.2% and the one from imports to 38.2. Substantial heterogeneity exists within the region: Arad is the most export and import oriented (45.7% and 41.4% of GDP, respectively) and Caras-Severin the least trade-open (11.4% and 9% of GDP, respectively).

Figure 16: Exports as % of GDP (2005 and 2009)



Source: World Bank staff calculation based on SBS data

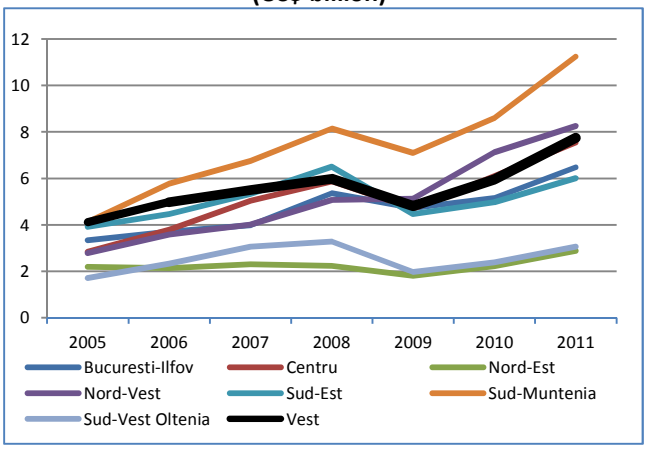
Figure 17: Imports as % of GDP (2005 and 2009)



Source: World Bank staff calculation based on SBS data

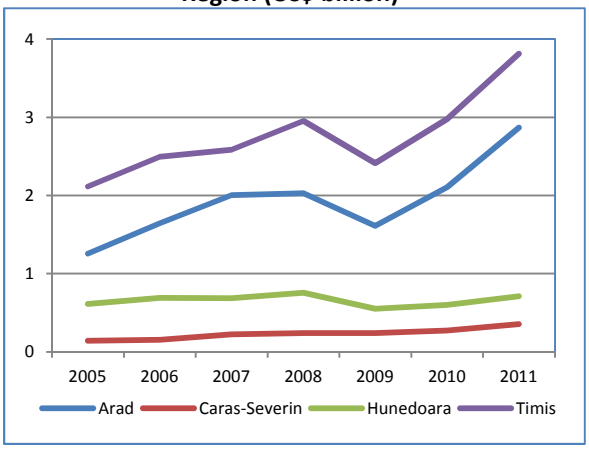
44. **Overall, the West Region export performance is very positive:** export growth is sustained (Figure 18), particularly since 2009 and is driven by the performance of firms located in Arad and Timis (Figure 19) while export growth in Hunedoara and Caras-Severin lags the performance of the two lead counties. Moreover, the region, as well as each of its counties, is a net exporter. This is not the case of comparator regions (Bucharest-Ilfov, Center and North-West) that are also very dynamic in terms of exports. In the West Region, not only do Arad and Timis have substantially greater firm density than 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) of being an exporter is 67 percent greater than in Caraș-Severin and 50 percent greater than in Hunedoara. The average firm in Arad and Timis exported around 40 percent of output in 2010, while in Caras-Severin and Hunedoara, the average firm exported only half that level.

Figure 18: Exports across Romanian Regions (US$ billion)



Source: World Bank staff calculation based on SBS data

Figure 19: Exports for the counties of the West Region (US$ billion)



Source: World Bank staff calculation based on SBS data

III.2. Main challenges

Fruits of economic growth were not distributed evenly across the region

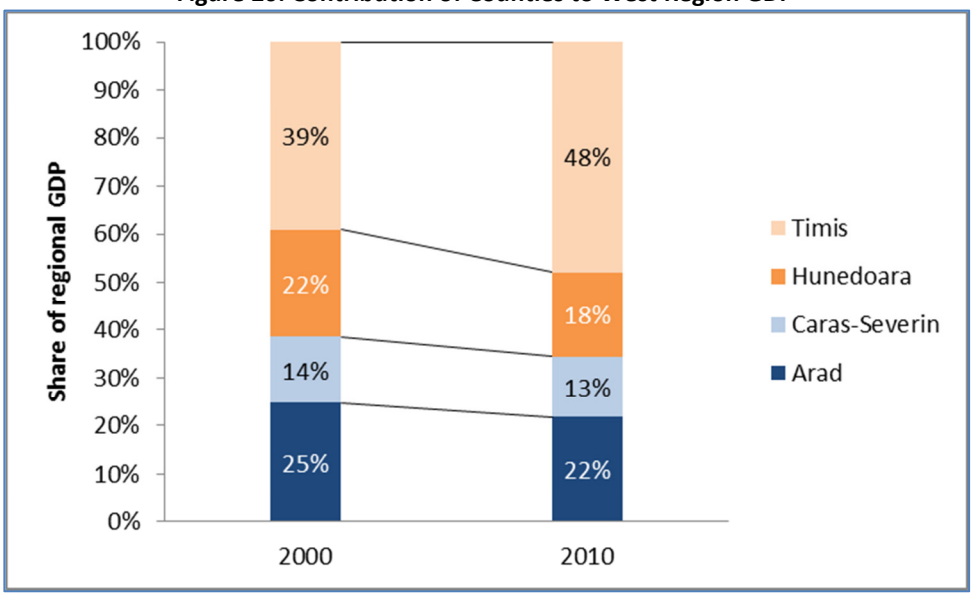
45. **The fruits of economic growth and convergence with Europe were not distributed evenly across the region.** Already substantial inequalities in economic and social outcomes were exacerbated sharply over the past decade. In both absolute levels of development and growth, Timis County dominates, having 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 (Table 4). 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 20).

Table 4: 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	5,100	102	12,900	113
EU-27 average	19,000	380	24,500	215

Source: World Bank staff 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 20: Contribution of Counties to West Region GDP

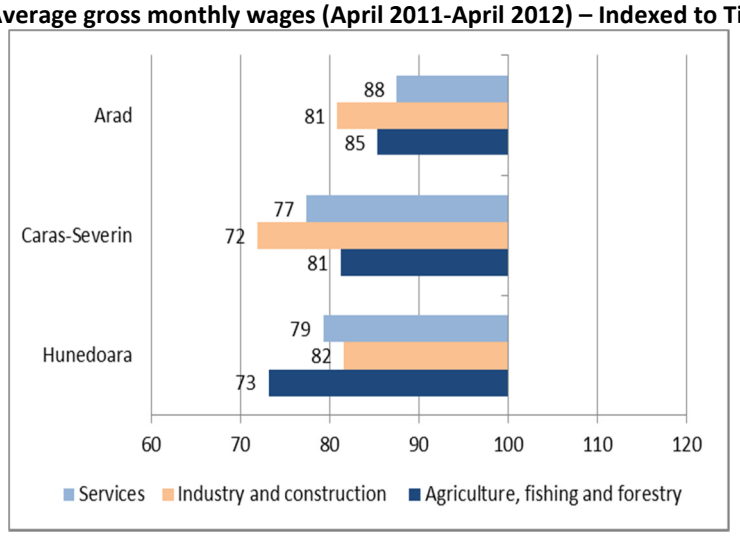


Source: World Bank staff calculations based on data from Eurostat: Gross domestic product (GDP) at current market prices by NUTS 3 regions – millions of Euro [nama_r_e3gdp]

46. **Income disparities are linked to the concentration of population and economic activity in the main urban areas.** 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.

47. **The West Region is a leader in the national context in terms of wage levels, 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 21 illustrates, the wage gap also varies by sector, with the manufacturing and construction sector showing, on average, the largest gap.

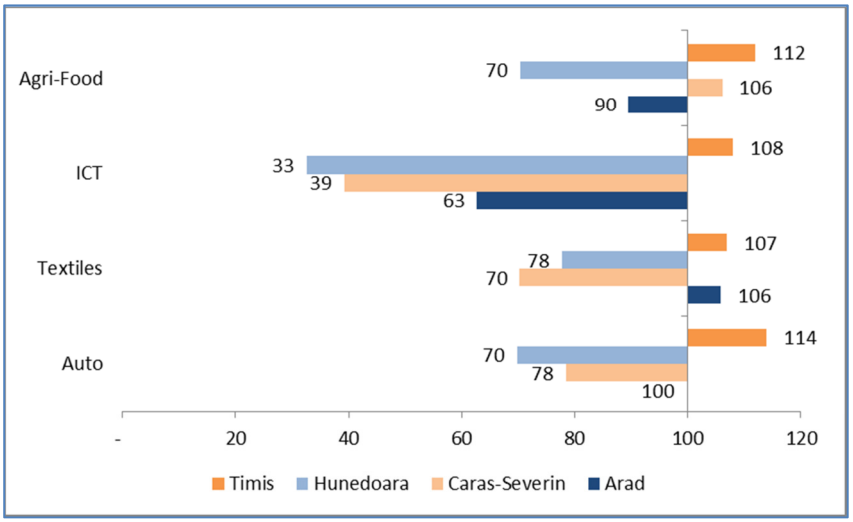
Figure 21: Average gross monthly wages (April 2011-April 2012) – Indexed to Timis County



Source: World Bank staff calculations based on data from Institute of National Statistics; Monthly gross wages at NACE 2

48. **While the nominal wage differences are partly a function of differences in the cost of living[23], it appears that they also reflect real differences in productivity and skills across counties.** Figure 21 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.

Figure 22: Comparison of Value-Added Per Worker (2010) in West Region's Main Clusters

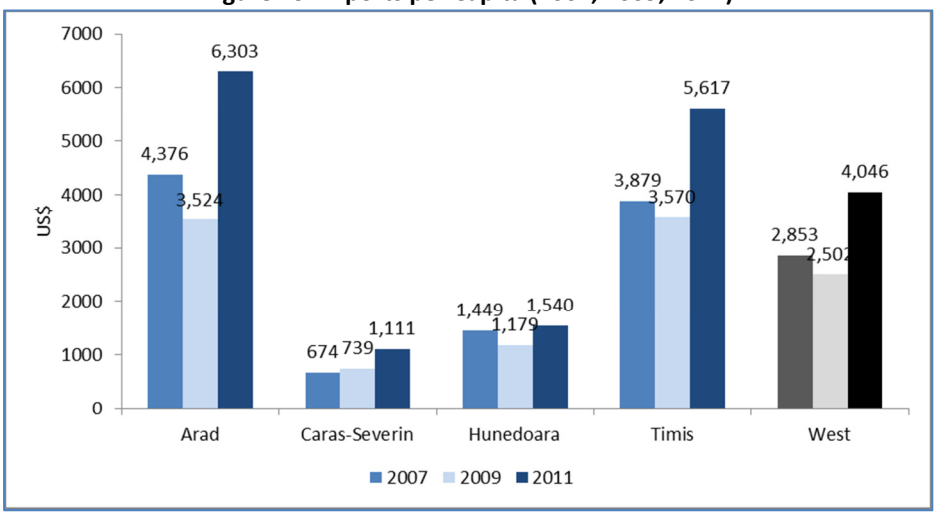


Source: Calculations based on data from Structural Business Survey
Note: In the Auto cluster, the index for Arad is 100 (equal to the regional average) – therefore no bar is visible in the figure.

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

49. **Another relevant cross-county difference 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 23 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 23- Exports per Capita (2007, 2009, 2011)



Source: Calculations based on customs data from Institute of National Statistics

As a result of the spatial effect of the transition of the economy and conditioned in part by geography, productive activities are located unevenly across the region, which reinforces the income disparities.

50. **As part of a post socialist country, the West region economy was dominated by large state industries up until the early 1990s.** While there has been a rapid transition to a market economy, the lack of a tradition of entrepreneurship and SMEs during the communist period has been a hindrance to bottom-up economic development. In this regard, the planned localization of productive activities and the distribution of productive capacities did not reflect market dynamics.

51. **When transitioning to a market economy, some counties, supported in part by geographic conditions, were able to progress while others have maintained their specialization in sectors based on their physical endowments.** 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. Meanwhile, Timișoara and Arad benefited from the industrialization that these strategies facilitated, but without the downside of excessive concentration.

52. **These geographical endowments and development patterns still play a significant role in shaping the economies of the counties today and have reinforced regional disparities.** As discussed in the report "Economic Geography Assessment: Territorial Development Challenges in the West Region" Table 5 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.

Table 5- 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.

53. **The fact that Timis, and more broadly the Timis-Arad agglomeration is pulling away from the rest of the region on virtually every measure of competitiveness 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.

Despite a relatively significant number of universities and good university enrollment rates, the region faces important shortcomings at all levels of training and skills development

54. **While the West Region has clear strength in tertiary education in the Romanian context, its advantage in upper secondary and post-secondary (non-tertiary) education is far from apparent.** Enrollment rates in secondary education are only moderately ahead of the national average. Of more concern, is the relative performance of its students in upper secondary education. Table 6 shows that in 2011 and 2012, every county in the West Region performed in the bottom quartile of Romanian counties in the first presentation of the baccalaureate examination[24]. While leading counties in the North West like Cluj and Bihor ranked 3rd and 5th respectively (out of 42 counties), Timis and Arad ranked 34th and 36th.

Table 6: Percentage of Students Passing the Baccalaureate Examination (2011 and 2012)

Rank	NUTS3	Region	2011	2012	Avg
1	RO221	BRAILA	57.0	60.0	58.5
2	RO215	SUCEAVA	65.0	47.0	56.0
3	RO113	CLUJ	54.1	54.3	54.2
4	RO126	SIBIU	53.8	51.7	52.7
5	RO111	BIHOR	50.4	53.4	51.9
6	RO222	BUZAU	53.2	50.2	51.7
7	RO223	CONSTANTA	57.6	45.2	51.4
8	RO116	SALAJ	57.2	42.5	49.9
9	RO213	IASI	41.9	56.1	49.0
10	RO316	PRAHOVA	51.0	45.5	48.2
11	RO122	BRASOV	45.9	49.8	47.8
12	RO212	BOTOSANI	56.0	38.9	47.5
13	RO114	MARAMURES	46.4	48.0	47.2
14	RO124	HARGHITA	64.0	30.3	47.1
15	RO415	VâLCEA	54.4	38.3	46.4
16	RO125	MURES	46.3	46.0	46.1
17	RO317	TELEORMAN	46.0		*46.0*
18	RO216	VASLUI	43.3	48.2	45.7
19	RO211	BACAU	45.6	45.4	45.5
20	RO214	NEAMT	44.5		*44.5*
21	RO115	SATU MARE	43.0		*43.0*
22	RO121	ALBA	38.4	47.0	42.7
23	RO112	BISTRITA-NASAUD	41.9	41.8	41.8
24	RO226	VRANCEA	38.7	43.5	41.1
25	RO321	BUCURESTI	42.0	39.0	40.5
26	RO411	DOLJ	39.7	40.9	40.3
27	RO315	IALOMITA	40.2		*40.2*
28	RO312	CALARASI	40.9	37.2	39.0
29	RO225	TULCEA	37.0	41.0	39.0
30	RO123	COVASNA	44.3	32.4	38.4
31	RO423	HUNEDOARA	39.0	36.9	38.0
32	RO224	GALATI	30.0	45.1	37.5
33	RO311	ARGES	36.4	38.0	37.2
34	RO424	TIMIS	31.8	42.2	37.0
35	RO313	DâMBOVITA	35.0	38.7	36.9
36	RO421	ARAD	34.4	39.1	36.8
37	RO314	GIURGIU	20.0	42.3	31.2
38	RO414	OLT		30.0	*30.0*
39	RO412	GORJ	34.9	25.0	30.0
40	RO413	MEHEDINTI	27.5	30.9	29.2
41	RO422	CARAS-SEVERIN	24.8		*24.8*
42	RO322	ILFOV	24.4	14.7	19.5

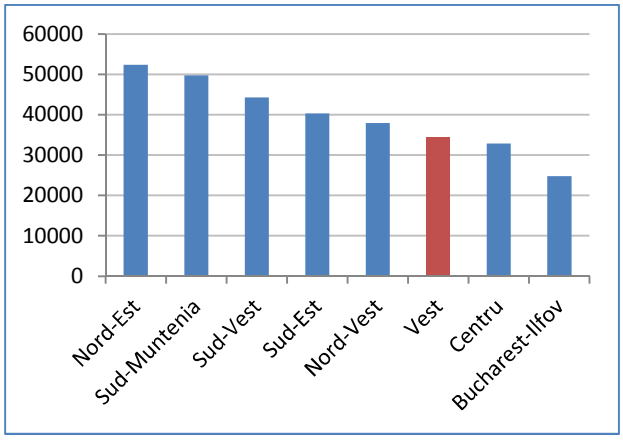
*S*ource: http://www.gandul.info/news/rezultate-bacalaureat-2012-harta-rusinii-pe-judete-o-comparatie-intre-rezultatele-la-bac-de-anul-acesta-si-cele-de-anul-trecut-9830731

55. **In addition, West region lags behind other peers in terms of enrollment in TVET programs.** Romania has a long tradition on Technical and Vocational Education and Training (TVET) program. Recent numbers from INS show that West region lags behind other peers in terms of enrollment in TVET. Data shows that in 2011 the West Region had the third lowest number of students enrolled in technical high schools of all the regions in Romania (34, 441), and in 2010 was the fourth region number of students enrolled in foreman education (523). In addition, between 2008 and 2011, enrollment in agricultural high schools has remained constant and was in 2011 the lowest of all the regions in Romania (6522 students). The lack of interest in technical education from potential students – possibly explained, in part, by outdated curriculums with insufficient connection with the private sector needs and by the

[24] There is a second presentation of the exam in the Autumn of each year

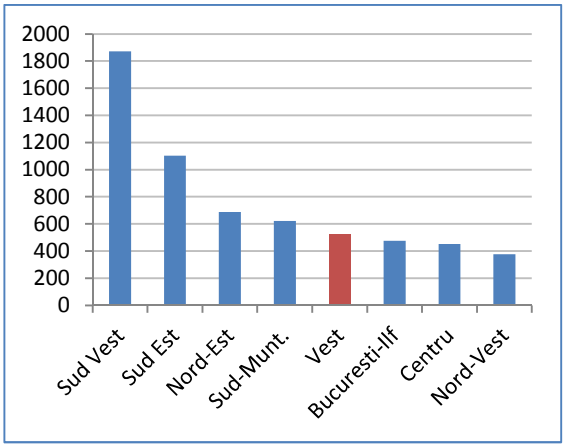
lack of modern machinery that would be needed to obtain industry-relevant knowledge – might be a reason behind this performance.

Figure 24- Number of students enrolled in technical education (2011)



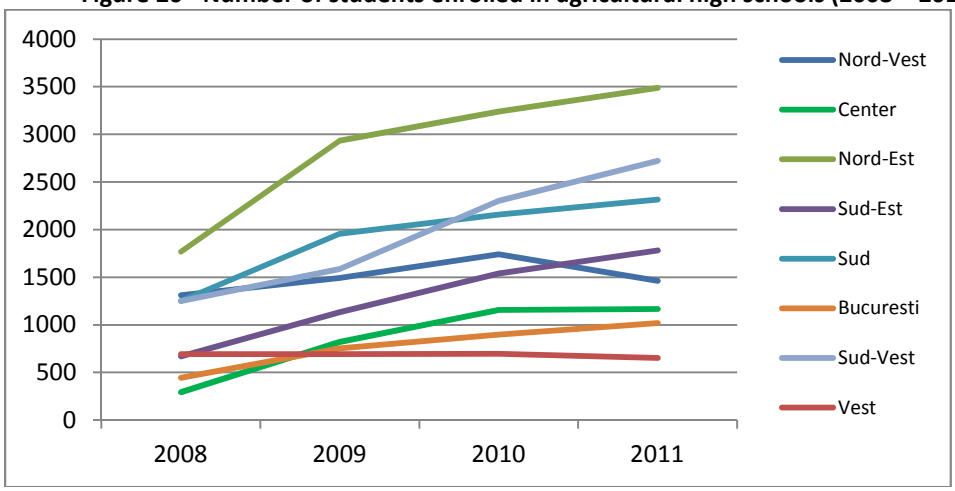
Source: Institute of National Statistics

Figure 25 - Number of students enrolled in foremen education (2010)



Source: Institute of National Statistics

Figure 26 - Number of students enrolled in agricultural high schools (2008 – 2011)



Source: Institute of National Statistics

Economic activity is increasingly concentrated by sector, firm size and firm ownership

56. **Economic activity in the West Region is concentrated in a handful of sectors that represent about half of the region's turnover and employment**[25]**.** According to the World Bank report "Competitiveness of West Romania Firms: Diagnostics, Challenges and Opportunities", the top ten sectors in the West Region listed on (Table 7) accounted for almost 54% of turnover and 55% of employment in 2010 and the concentration of the West Region economic activity around them has increased between 2008 and 2010.[26]

[25] Sectors are defined as 2-digit groups according to the NACE Rev 2 classification.

[26] Drawing on the World Bank report "Competitiveness of West Romania Firms: Diagnostics, Challenges and Opportunities" these numbers are based on the final sample of the SBS survey data – as after excluding for outliers. Regarding the outlier control, a number of restrictions are imposed in order to control for outlier values.

Table 7: Main Economic Sectors in the West Region (% total)

	Turnover		Employment	
Nace 2-digit sector	**2008**	**2010**	**2008**	**2010**
Manufacture of motor vehicles, trailers and semi-trailers	9.0	22.4	10.1	17.0
Manufacture of wearing apparel	1.8	2.6	5.8	5.2
Wholesale trade, except of motor vehicles and motorcycles	16.9	9.2	5.3	4.9
Retail trade, except of motor vehicles and motorcycles	6.6	3.8	4.7	4.4
Manufacture of leather and related products	1.4	2.1	4.6	4.1
Manufacture of food products	3.7	4.8	3.7	4.1
Land transport and transport via pipelines	2.9	2.5	3.5	4.1
Mining of coal and lignite	1.0	0.6	4.2	3.9
Construction of buildings	5.5	2.6	5.4	3.7
Manufacture of computer, electronic and optical products	2.1	3.2	3.0	3.4
Top 10 Nace 2 digit sectors	**51.0**	**53.8**	**50.3**	**54.7**

Source: World Bank staff calculation based on SBS data.

57. **The auto industry is by far the biggest employer in the region among manufacturing sectors** with an importance in terms of total employment that is similar (17%) to the combined share (16.8%) of employment represented by all the other manufacturing sectors listed in Table 7. Among the services sectors, wholesale and retail trade dominate the landscape in terms of turnover (9.2% and 3.8% respectively) although transportation and construction are also relatively important in terms of employment (4.1% and 3.7% respectively).

58. **Concentration towards fewer firms is also a prominent feature.** West Romania has less small business than other regions in Romania. Table 8 reports the share of firms in different size categories: less than 10 employees, 10-50 employees, 50-250, 250-1000 and more than 1000. The West region shows the second highest share of very big firms (more than 1000 employees), and the third highest of large ones (250-1000). In this region, 3.18% of the firms have more than 250 employees, against 3.41% in all Romania, 4.72% in Bucharest, 3.46% in the Center and only 2.75% in the North-West. And these large firms account for more than 62% of total turnover. Comparable figures for Romania as a whole and for Bucharest-Ilfov are 59% and 57%, respectively (Table 10).

First, observations for which information on employment, stock of fixed assets, material costs or value added are missing or lower/equal to zero are dropped from the panel. Second, observations with tangible fixed assets to employee and value added to employee ratios greater (smaller) than three times the standard deviation from the upper (lower) quartile in the corresponding 2-digit sector and year are also dropped from the sample.

Table 8. Number of Firms, And Shares by Size Categories in 2010 (with % change between 2008 and 2010 in parentheses)

Region	Nb. of firms	% of firms with <10 employees	10 – 50 employees	50 - 250 employees	250 - 1000 employees	>1000 employees
All	41,852 *(-10.4)*	31.24 *(-0.5)*	48.42 *(-11.5)*	16.93 *(-20.6)*	2.82 *(-18.0)*	0.59 *(-15.4)*
Bucharest-Ilfov	9,894 *(-7.6)*	28.93 *(1.9)*	48.01 *(-9.1)*	18.34 *(-15.6)*	3.65 *(-12.4)*	1.07 *(-7.8)*
Center	5,382 *(-11.0)*	28.5 *(-1.6)*	49.46 *(-12.3)*	18.58 *(-18.9)*	3.07 *(-14.5)*	0.39 *(-22.2)*
North-East	4,439 *(-15.5)*	32.85 *(-3.7)*	48.79 *(-16.3)*	15.68 *(-29.4)*	2.41 *(-28.2)*	0.27 *(-14.3)*
North-West	5,604 *(9.6)*	29.5 *(-1.7)*	52.12 *(-8.4)*	15.63 *(-23.4)*	2.34 *(-18.6)*	0.41 *(-17.9)*
South-East	4,650 *(-12.3)*	32.95 *(-1.0)*	47.85 *(-13.9)*	16.39 *(-24.0)*	2.43 *(-20.4)*	0.39 *(-30.8)*
South-Muntenia	4,693 *(-8.6)*	32.39 *(1.2)*	47.75 *(-9.5)*	16.75 *(-19.5)*	2.66 *(-20.4)*	0.45 *(-19.2)*
South-West Oltenia	3,131 *(-9.7)*	37.88 *(0.5)*	45.23 *(-12.3)*	13.86 *(-20.9)*	2.43 *(-20.0)*	0.61 *(32.1)*
West	4,059 *(-11.2)*	32.72 *(-1.6)*	46.42 *(-13.5)*	17.69 *(-18.9)*	2.49 *(-21.7)*	0.69 *(-3.4)*

Source: Crozet et al (2013) [27]

Table 9. Market Share by Categories of Firms In 2010 (with % change between 2008 and 2010 in parentheses)

Region	Firm with: <10 employees	10 – 50 employees	50 - 250 employees	250 - 1000 employees	>1000 employees
All	5.52 *(5.75)*	12.55 *(-2.2)*	22.19 *(-3.27)*	27.94 *(7.45)*	31.79 *(-3.65)*
Bucharest	4.38 *(-2.16)*	11.81 *(5.48)*	27.21 *(-0.86)*	38.24 *(-1.68)*	18.35 *(2.07)*
Center	5.2 *(-7.96)*	12.92 *(-12.4)*	29.09 *(0.07)*	28.31 *(-13.78)*	24.48 *(38.33)*
North-East	10.09 *(5.71)*	19.81 *(7.12)*	28.68 *(-1.01)*	28.78 *(-7.97)*	12.64 *(7.86)*
North-West	5.93 *(-7.53)*	13.29 *(-16.72)*	21.73 *(-19.13)*	21.93 *(9.17)*	37.12 *(21.03)*
South	4.24 *(15.6)*	9.7 *(-19.53)*	18.29 *(17.41)*	31.23 *(39.94)*	36.54 *(-21.23)*
South-East	6.61 *(47.88)*	13.68 *(26.33)*	15.13 *(8.38)*	17.16 *(21.99)*	47.42 *(-16.33)*
South-West	5.79 (18.36)	11.22 (23.72)	17.38 (-1.41)	21.28 (12.21)	44.33 (-10.35)
West	5.08 *(-11.19)*	12.11 *(-7.43)*	20.43 *(-22.98)*	29.6 *(30.44)*	32.79 *(2.49)*

Source: Crozet et al (2013)

59. **Firms are also concentrated geographically.** West Romania firms mainly restrict their operations to the region. They do not seem inclined to expand activities outside the region and to exploit comparative advantages of other parts of the country. Moreover, when they venture outside the

[27] Crozet, M, Millet, E and Taglioni, D (2013) "Firm Size, Firm Heterogeneity and Industrial Performance" Background paper prepared for the World Bank report "Competitiveness of West Romania Firms: Diagnostics, Challenges and Opportunities".

regional borders, they start small in size. Table 10 and Table 11 present descriptive statistics about plants owned by firms headquartered in the region. In 2010, there were 4,059 firms with headquarters located in the West Region.[28] These firms owned a total of 4,587 plants almost entirely located in the region: only 252 plants were located in other regions (Table 10), and the majority of these plants located outside the Western borders (64.7%) belongs predominantly to small firms (0-9 full time employees) producing chemicals or carrying wholesale trade activities (Table 11). This evidence suggests that the productive landscape of the West Region is relatively self-sufficient, with no sign of linkages to other parts of Romania.

Table 10. Plants Owned by Firms Headquartered In the West Region (2010)

Region	Freq.	Percent
North-East	24	0.52
South-East	27	0.59
South-Muntenia	22	0.48
South-West Oltenia	17	0.37
West	4,335	94.51
North-West	66	1.44
Center	63	1.37
Bucharest-Ilfov	33	0.72
Total	4,587	100

Source: World Bank staff calculation based on SBS data.

Table 11. Out of Region Plant Size of Firms Headquartered in the West Region (2010)

Size (# employees)	Plants	Percent
0-9	168	64.7
10-49	58	23.0
50-249	28	11.1
>=250	3	1.2
Total	252	100

Source: World Bank staff calculation based on SBS data.

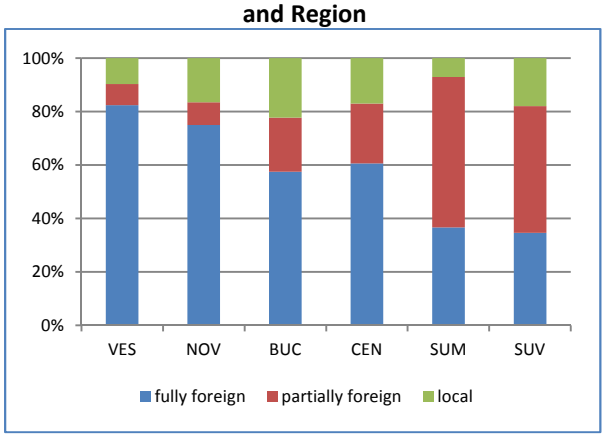
60. **Sectorial, firm and geographical concentration may lead to high volatility of value added growth and sharp drop of per capita GDP during a crisis.** By contrast, a diversified portfolio would dampen price fluctuations, as having more products, firms and/or production facilities in diverse geographical areas is likely to lead to independent price dynamics, with smoothening effects on total earnings. The more diversified and unrelated the region's production and exports, the less volatile its earnings would be. Put it differently, a more diversified portfolio of production would lead to a more stable stream of export revenues.

[28] These numbers draw on the World Bank report "Competitiveness of West Romania Firms: Diagnostics, Challenges and Opportunities" this exercise is based on the final sample of the SBS survey data – as after excluding for outliers.

Export performance is also very concentrated and intensive in relatively low skilled and less sophisticated products

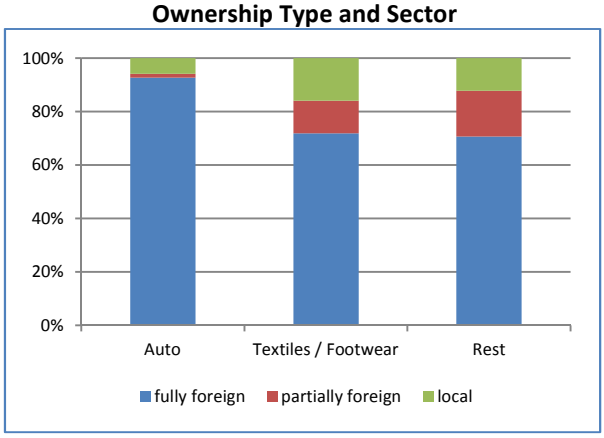
61. **The export-driven growth model of the region is potentially very vulnerable to exogenous developments.** West Romania's exports are over-reliant on a handful of foreign owned large exporters mainly from the auto and apparel/footwear industry. Foreign ownership of exporting firms is a salient feature of the export sector in the West Region. For Romania as a whole, FDI is an important player as the majority of Romania's exports originates in either fully (47%) or partially foreign-owned firms (26.4%). However, the relevance of foreign-owned firms is particularly significant in the West Region. As much as 82.4% of exports are generated by fully foreign-owned firms and an additional 7.9% of exports comes from partially foreign-owned firms. These percentages for fully foreign firms are the highest among comparator regions (Figure 27).The degree of dominance of fully foreign-owned firms in exports flows in the West Region varies among the major export sectors ranging from 92.6% of exports in the auto sector to 70.7% in exports outside auto and apparel/footwear (Figure 28).

Figure 27- Percentage of Exports by Ownership Type and Region



Source: World bank staff calculations based on INS data

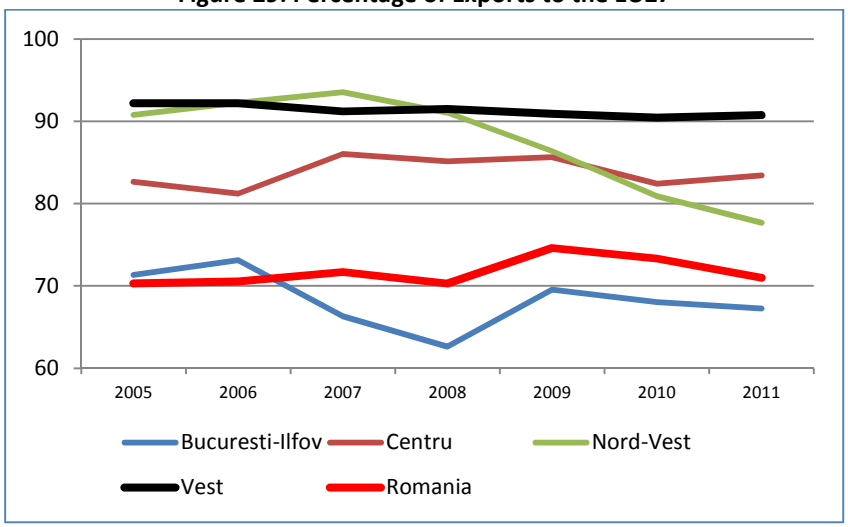
Figure 28- West Region: Percentage of Exports by Ownership Type and Sector



Source: World bank staff calculations based on INS data

62. **Moreover, export growth over the period 2005-2011 has been very reliant on the "intensive margin"**, i.e. 75% of export growth came from incumbent exporters going to markets they already served and with no innovation in terms of product range. These factors make the region very vulnerable to exogenous developments. For example, the total exports from the region experienced a decline of 19.4% during the 2008-2009 trade collapse, with exports to some countries shrinking by more than a third. The concentration of export activity is matched with a very volatile economic performance. The EU remains by far the most important destination market and its importance has not diminished over time. The EU absorbs 90% of the exports of the West Region (Figure 29).

Figure 29: Percentage of Exports to the EU27



Source: World bank staff calculations based on INS data

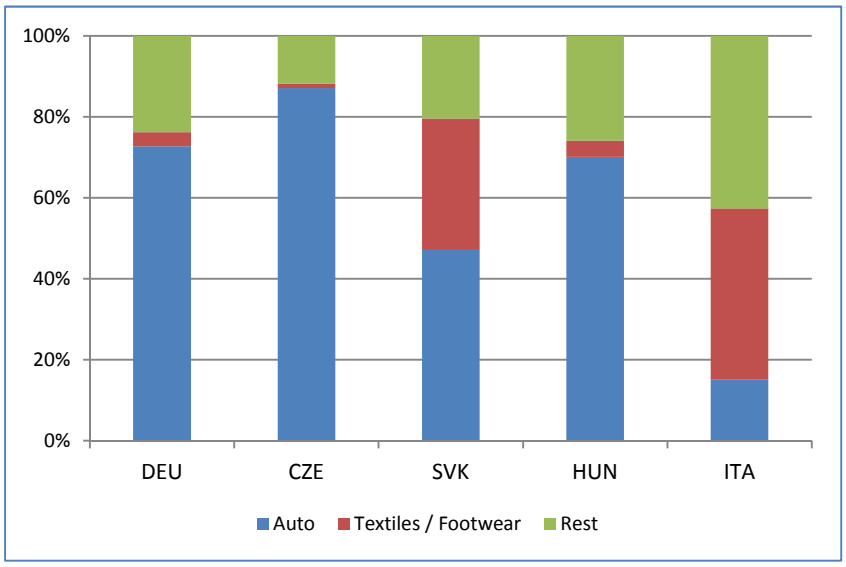
63. **There is a shift in destination markets within the EU.** While traditionally the main export market was Italy, more recently the bulk of exports are directed to Germany, the Czech Republic, Slovakia and Hungary, which also accounted for almost 60% of export growth in 2009-2011. Italy is not the only market of declining importance for West Region exports. The share of exports towards France, Austria and the United Kingdom is also diminishing (Table 12). The geographic reorientation of the West Region exports is associated with a shift in specialization, from textiles to automotive and to the participation of West Region exporters in international value chains (Figure 30).

Table 12: West Region – Top Ten Export Market Destinations in 2011

	Value (US$ million)		% exports		Average annual growth rate			
	2005	**2011**	**2005**	**2011**	**2005-11**	**2005-08**	**2008-09**	**2009-11**
Germany	782	2,577	19.0	33.3	22.0	25.9	-7.7	33.7
Italy	1,116	1,340	27.1	17.3	3.1	9.0	-29.0	14.3
Hungary	220	478	5.3	6.2	13.8	26.4	-37.8	31.6
France	437	457	10.6	5.9	0.8	0.1	-19.4	13.8
Czech Rep	27	349	0.7	4.5	53.3	85.2	14.8	33.3
Slovakia	26	338	0.6	4.4	53.8	89.8	-41.3	81.4
UK	340	250	8.2	3.2	-5.0	-8.8	-36.6	23.6
Austria	472	204	11.5	2.6	-13.0	-21.5	-27.8	11.4
Belgium	53	180	1.3	2.3	22.8	25.5	-36.7	65.5
Spain	77	165	1.9	2.1	13.5	14.4	11.8	12.9
Top 10	3,549	6,339	86.1	81.9	10.1	11.7	-20.6	27.2
Total Exports	**4,121**	**7,744**	**100.0**	**100.0**	**11.1**	**13.2**	**-19.4**	**26.8**

Source: World bank staff calculations based on INS data

Figure 30: Composition of Exports by Destination



Source: World bank staff calculations based on INS data

64. **Overall, West Region exports are concentrated in relatively low-skill, low-sophistication industries** like footwear, textile, rubber, wood, and agro industries or other basic manufactures, in terms of revealed comparative advantage (Table 13). Mid-tech industries come only at the 13th and 14th place of the ranking, with electrical machinery (HS 85) and vehicles (HS 87). Separate analysis shows that the four counties of the West Region have a common comparative advantage in some primary goods, such as live animals, trees and other plants, edible vegetables and fruits. Exports from Arad, Hunedoara and Timis are also strong in HS sectors 82-85 which cover tools and articles of base metals, nuclear reactors, boilers, machinery and mechanical appliances and electrical machinery and equipment.

Table 13: Evolution of Revealed Comparative Advantages in the West Region, 2005 and 2011

HS2	HS 2-digit sector	% total exports		RCA	
		2005	2011	2005	2011
64	Footwear, gaiters and the like; parts of such	9.8	6.6	13.6	9.9
40	Rubber and articles thereof.	6.4	9.3	6.2	7.1
59	Impregnated, coated, cover/laminated textile f	0.0	0.7	0.2	6.2
94	Furniture; bedding, mattress, matt support, cu	4.7	5.4	3.6	5.0
67	Prepr feathers & down; arti flower; articles h	0.0	0.1	0.9	4.4
1	Live animals	0.3	0.5	2.4	3.9
41	Raw hides and skins (other than furskins) and	0.3	0.6	1.1	3.6
61	Art of apparel & clothing access, knitted or c	9.4	3.5	7.6	3.1
5	Products of animal origin, nes or included.	0.1	0.1	1.0	2.6
58	Special woven fab; tufted tex fab; lace; tapes	0.2	0.1	1.9	2.5
65	Headgear and parts thereof.	0.2	0.1	3.8	2.5
44	Wood and articles of wood; wood charcoal.	2.1	1.7	2.0	2.3
85	Electrical mchy equip parts thereof; sound rec	33.9	28.9	2.4	2.3
87	Vehicles	8.9	16.3	1.0	2.3
69	Ceramic products.	0.6	0.5	1.9	2.2
62	Art of apparel & clothing access, not knitted/	6.3	2.4	4.3	2.1
42	Articles of leather; saddlery/harness; travel	0.8	0.7	2.2	1.8
57	Carpets and other textile floor coverings.	0.0	0.1	0.0	1.6
76	Aluminium and articles thereof.	0.2	1.4	0.2	1.5
83	Miscellaneous articles of base metal.	0.5	0.5	1.2	1.4

Source: World bank staff calculations based on INS data

Increasing integration with regional value chains, leading to low local value addition

65. **The West Region's growth performance over the past decade is inextricably linked to wider regional and global forces in the manufacturing sector**, specifically, the "second unbundling" of global production (Baldwin, 2012)[29], where individual manufacturing tasks are separated and geographically dispersed over wide ranging global production networks. These trends have facilitated the emergence of a major automotive supply sector in West Romania, which has leveraged its location, relatively low wages, and engineering skills to attract first tier suppliers to European (particularly German) automotive manufacturers. In the textile, apparel, and footwear sectors, too, the West Region has become a supplier to regional production networks based in Italy, Germany, and elsewhere. This has not only contributed to significant investment and job creation, but has played an important role in integrating the West Region ever more tightly into the European economy.

66. **In fact, there is evidence showing that the region is connected to global value chains in agro-food, automotive, textile and ICT activities.**[30] The use of methodology and classification developed by

[29] Baldwin, R. (2012). "Trade and industrialisation after globalisation's 2nd unbundling: How building and joining a supply chain are different and why it matters". CEPR Discussion Papers 8768.
[30] See the World Bank report "Smart Specialization case Studies" for more detailed results.

Taymaz et al (2011)[31] - which assigns exports goods (categorized at the 4-digit ISIC code) to one of four stages of production, namely: final products; main inputs/parts; standard inputs; raw materials[32] - allows the identification of the ways in which the West region is connected to the value chains. For the auto cluster, evidence presented in Table 14 suggests that almost all exports came from *standard auto parts* (98.3%) – especially through products including "Steering wheels, steering columns and steering" (HS870894), "New pneumatic tyres, of rubber"(HS401110), "Motor vehicle parts" (HS870899), "Parts and accessories of bodies nes for motor"(HS870829) and "Safety seat belts for motor vehicles" (HS870821). For the textile sector, evidence indicates that the West Region specializes in exporting *final products* (84.3%), especially through the products "Women's or girls' briefs and panties of cotton" (HS 610821), "T-shirts, singlets and other vests, of cotton" (HS610910), "T-shirts, singlets, etc, of other textiles, nes" (HS 610990), and "Brassieres" (HS621210). Unlike the case of the auto and textiles/apparel value chains, the West Region shows some specialization in more than one segment of the export value chain of the agro food. Both the *final products* (20.8%) and *raw materials* (67.1%) segments have been important in terms of exports for the agro food cluster in the West Region, although the former has traditionally represented the bulk of the activity in the industry. In the final products segment, the most relevant exported products are "Cane or beet sugar, in solid form" (HS170199) and "Molluscs and other aquatic invertebrates" (HS160590); in the raw materials segment, the main products are "Maize" (HS 100590), "Walnuts without shells, fresh or dried" (HS 80232) and "Spelt, common wheat and meslin" (HS100190). Regarding the ICT cluster, the lack of export data for service sectors – which includes ICT services – prevents the use of the Taymaz et al (2011) methodology. However, the presence of foreign owned firms in the ICT cluster in the region reflects, in some extent, the way in which the region is connected with the global networks. The majority of ICT firms interviewed as part of the World Bank report "Smart Specialization Case Studies" develop software exclusively for the headquarters of amother company or for a single foreign firm that outsources this task to the firm in the West Region.

Table 14- How the West region is connected to the value chain: exports in the cluster by stage of production (% sector exports in 2011)

Value chain stage/segment	Automotive	Textile	Agro-food
Final products	1.5	84.3	20.8
Main parts and components	0.1	2.0	6.0
Raw Material	0.0	12.4	67.1
Standard parts	98.3	0.8	0.0

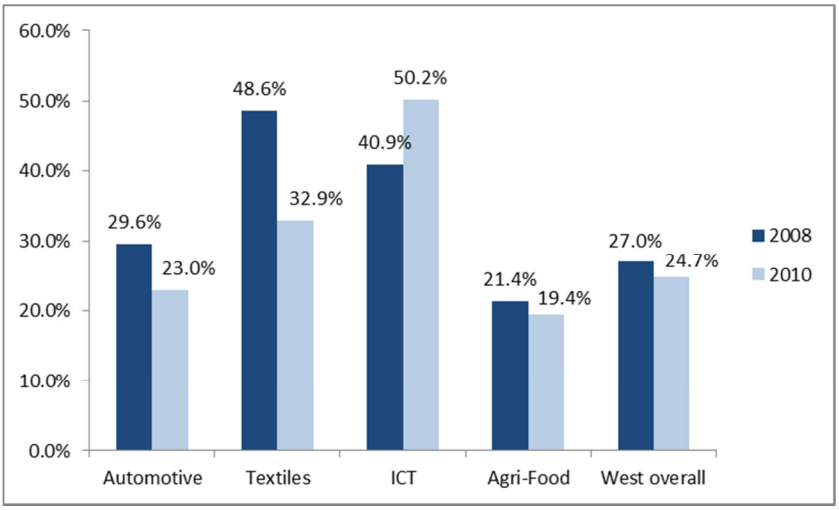
Source: World Bank staff elaboration based on INS customs level data

[31] Taymaz, Erol, Ebru Voyvoda and Kamil Yýlmaz (2011). "Uluslararasý Uretim Zincirlerinde Donusum ve Turkiye'nin Konumu" ["Transformation in International Production Chains and Turkey's Position"], Istanbul, TUSIAD-Koc University Economic Research Forum

[32] The original classification includes an extra segment, machinery and equipment, that is excluded for the purposes of the analysis due to its small relevance for the region. The classification distinguishes four stages of production for five industries (motor vehicles, textiles and apparel, food, TV, and machinery) but only the classifications for the first three industries are relevant for the West Region and thus used in this analysis. The classification identifies the final products, its main inputs and parts, other more standard inputs, and the raw materials needed for the production of the final good. The advantage of the Taymaz et al. classification is that it carefully assigns activities and products to production stages, based on engineering considerations. There are at least two downsides. Being a classification that only covers goods exports, it does not identify the services segments of value chains, such as R&D, design, commercialization, distribution, marketing/branding, logistics, and after-sales services, precisely the segments that allow for functional upgrading. Second, being reliant on export data, it does not account for the domestic dimension of value chains thereby providing only a partial overview of the situation.

67. **A natural result of this fragmentation of production and of task specialization is a decreasing share of value added in output.** Globally, the value added share of trade declined by up to 10 percentage points between 1990 and 2009, a rate more than twice as rapid as in the previous 20 year period (Johnson and Noguera, 2012)[33]. Figure 31 highlights both the low levels of value addition on the West region and the significant differences that exist across sectors. What is perhaps most striking is how rapidly value added share of output has declined. In automotive for example, value added share fell from almost 29.6 percent to 23 percent in only three years between 2008 and 2010; in textiles the fall was more dramatic – from 48.6 percent to 32.9 percent over this period. Of course, this reflects structural changes in the activities taking place in the region rather than declining value added within individual firms.

Figure 31: Value added share of output in the West Region's strategic clusters (2008 and 2010)



Source: World Bank staff calculations based on INS data

68. **While declining value added at sector level is a global trend and is not inherently problematic, so long as net value added is growing in aggregate terms, declining value added share of output may raise some concerns**. First, if the nature of activities being carried out in the region is being hollowed out to specialize in increasingly commoditized activities, like simple labor assembly or cut-make-trim in apparel, the basis for regional competitiveness will increasingly become cost driven. Under this scenario, delivering increasing wages (and therefore converging to European average living standards) would become unsustainable. A related concern is that, where the value added contribution of a unit or location to overall output is low, it is less likely the business will be fully embedded in the local economy, particularly if it is foreign-owned. The issue is that such firms may be more likely to close or move out of the region. However, there are some punctual examples in the West region that illustrate the possibility that parts of the value chain that can be knowledge intensive can also be found also in mature manufacturing . In this regard, although the most significant activities in automotive and textiles are based primarily on low wage assembly activity, in both sectors there are examples of firms that are contributing high skills and technology (see Box 1) .

[33] Johnson, R., and Noguera, G. (2012). Fragmentation and trade in value added over four decades. Boulder: University of Colorado.

Box 1- High Value Added Manufacturing in the West Region

Continental purchased the existing Siemens VDO business in 2007, operates both manufacturing and R&D in the West Region. While production activities include substantial use of imported inputs, they also require significant technology and rely on a highly skilled workforce in the production of a range of electronics, including instrument and cluster display systems, airbag control units, and electronic parking brakes. In addition, Continental employs a large number of highly skilled researchers in its R&D center in Timisoara.

Cottontex is a textile and apparel company established in Timisoara in 1995 through foreign investment from Italy. While they initially produced basic items like cotton t-shirts and bags, as well as embroidery and silkscreen printing, over the years they invested in technology and design capabilities. Today, they are among the leading European companies producing specialized apparel for the cycling market, where production involves the use of highly technical fabrics and complex (non-sewing) manufacturing techniques.

Increasing dominance of foreign direct investment (FDI) with weak links across firms and to local suppliers

69. **This shift towards value chain participation is linked to another trend in the West Region's economic structure that has been highlighted by the analysis – the increasing importance of foreign-owned firms.** Due to its location and traditional links to Western Europe, the region has always been attractive to foreign investors. As a result, when Romania began the process of accession to the European Union, the West benefited significantly from the rush of foreign investment into the country. Component suppliers linked to Germany's automotive sector, in particular, made heavy investments in the West during the early part of the 2000s. This was based primarily on a simple strategy of leveraging the wage advantages of Romania while remaining as close as possible to Germany and to other parts of the sector based in Central Europe. Over the decade, the growth of the automotive sector in the West became almost exclusively a story of foreign investment. Today, more than half of automotive firms in the region (115 in total) have some foreign ownership. But more importantly these firms dominate the landscape, accounting for 90 percent or more of value added, employment, and exports (Figure 32).

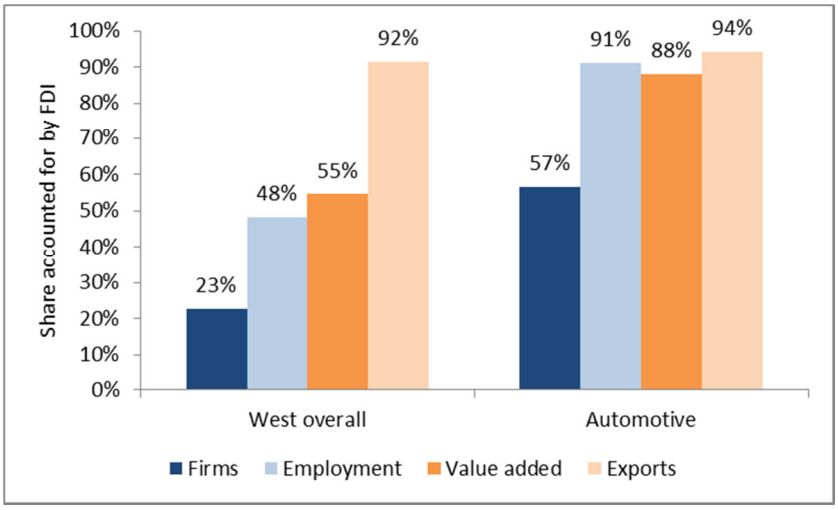
70. **While the automotive sector is an extreme case, foreign firms predominate across many sectors in the region.** They account for 50 percent of firms in the textile cluster and almost 40 percent of firms in the ICT cluster. Overall, firms with foreign ownership account for almost one quarter of all businesses in the West, around half of output and employment, and more than 90 percent of exports. It is worth noting, however, that despite these trends, the West Region remains only the fourth largest recipient of foreign investment in the country, behind Bucharest, Centre, and South Muntenia.[34]

71. **Foreign ownership in the region's key sectors brings with it both opportunities and risks. The main risk is that foreign firms are likely to be 'footloose',** that is they are more likely close plants and leave the region if conditions are no longer profitable or if other regions open up that offer better conditions (e.g. lower wages). This has long been a concern in labor intensive assembly industries worldwide, particularly apparel. To date there is no evidence to suggest that foreign-owned firms in the West region have been particularly footloose. In fact, Figure 33 indicates that fully foreign-owned firms were significantly less likely to close through the crisis than were domestically-owned firms or firms of partial foreign and domestic ownership. Moreover, in the automotive sector in particular, there are a number of examples of major foreign investors deepening their links to the region, rather than retrenching. Companies like TRW and Yazaki, and Continental have expanded from their initial investment and now operate multiple facilities in the region. Yazaki has made the West Region its supply

[34] Source: BNR; regional share of FDI stock at December 31, 2010.

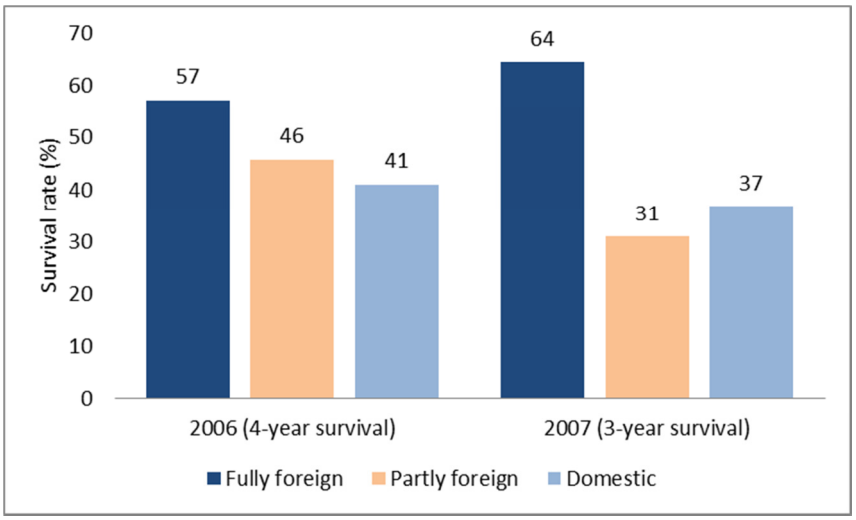
base for all of Europe, and they, along with Continental and other investors, have complemented labor intensive assembly operations with investments in R&D center.

Figure 32: Scope of Firms with Foreign Ownership in the West Region (2010)



Source: Calculations based on data from Business Registry
Note: Foreign firms include firms with any share of foreign participation, so includes both fully foreign-owned firms and firms with both foreign and domestic capital (the Business Registry does not indicate ownership shares, only "100 percent foreign", "100 percent local", and "mixed".

Figure 33: FDI and Domestic Firm Survival Rates for Firms of 20 or More Employees (Share of Firms from 2006 and 2007 Cohorts Remaining in Business as of 2010)



Source: Calculations based on data from Business Registry
Notes: "2006 and 2007 Cohorts" refers to the firms that started (as evidenced by being recorded in the Business Registry for the first time) in the respective years; "Survival" refers to the share of those firms that remain listed in the Business Registry as of 2010; "Partly Foreign" indicates that the firm has both foreign and Romanian capital.

72. **A second risk is that foreign owned firms 'crowd out' the local industry.** This may happen by outcompeting local firms in their traditional domestic market, by capturing scarce financing from local banks, or by attracting the most skilled labor available in the market. There is no evidence to suggest

that the first two of these are relevant in the West Region: foreign investors are focused almost exclusively on already established export markets; and they are financed from sources outside of Romania. However, there is reason to believe that the high demand for skilled labor from foreign firms and the opportunities they can offer may have negative implications for domestic firms. In particular, in the technical and managerial jobs, foreign firms are able to offer young Romanians the credentials of a foreign firm, the experience of learning in leading edge environment, and the potential to gain employment experience and opportunities abroad.

73. **It is worth stressing however that foreign owned firms can also bring significant benefits to the region, over and above the employment they create.** This comes from the "spillover" of knowledge and technology into the regional economy. As foreign firms are almost inevitably more productive and more technologically advanced than those in the domestic market, spillovers can play a critical role in improving the competitiveness of firms in the region. These spillovers occur through three main channels: through human capital (i.e. through workers), through supply relationships, and through competition and demonstration effects (via market competition and joint activities). While the region benefits from the spillovers through human capital – Romanians account for the vast majority of the workforce of foreign-owned firms, including in management and technical positions – supply chain linkages between the foreign and domestic sector are very weak. This is confirmed by both foreign investors and Romanian firms in the auto sector. A number of factors contribute to this, including scale economies, the difficulty for small local suppliers to meet international quality standards, and the fact that many purchasing decisions at the foreign-owned firms are taken not in the West Region plant but at the corporate headquarters.

IV. Sector case studies and identification of key policy areas

74. **The current chapter offers an overview of the economic specialization of the West Region of Romania, following a sectorial approach**, as a way to provide a more in-depth analysis that can support the development of a sustainable growth strategy at the regional level. Based on consultations with the Agency for Regional Development for the West Region of Romania, six clusters were selected for in-depth analysis, not because they are seen as "winning" activities per se, but because of their relevance and potential in the West Region's economy; they are: automotive, textiles, agro-food, ICT, construction, and tourism.[35] As smart specialization policies ought to focus on increasing the knowledge content and value added of existing production in industries where comparative advantages exist, and on facilitating the development of new economic activities through measures which support entrepreneurship and experimentation, the current chapter proposes areas for policy action both on a horizontal level (common to all sectors), as well as on a targeted, sector-specific level.

IV.1. Key challenges and opportunities for target sectors

75. **The effectiveness of targeted innovation and research policies depends on the information available in the market on whether the region (country) of interest has any sectors with observable comparative advantages.**

76. **Therefore, in order to design a successful smart specialization strategy, it is critical to understand whether knowledge is a binding constraint against structural transformation of the region,** as this also determines the nature of policy recommendations. If binding constraints relate to more structural bottlenecks on the business environment, the region needs to prioritize addressing these obstacles, while taking into consideration the next steps in research and innovation in its medium or long term agenda. On the other hand, targeted research and innovation policies can help sound companies in regions with apparent comparative advantage to keep a competitive edge in international markets or to cope with growing international competition, or support potentially high growth companies to unleash latent comparative advantage through, for example, R&D and innovation policies, investments in skills formation, or other business development services.

77. **The World Bank "Smart Specialization Case Studies Report" has examined in detail the economic specialization of the West Region and the clusters under analysis were classified in terms of comparative advantage.** Available information suggests an apparent comparative advantage in automotive, textiles and ICT, while agro-food and tourism were identified as clusters with latent comparative advantage. The construction cluster, on the other hand, has unclear comparative advantage.

78. **In addition, for each cluster a number of specialization niches were identified.** It is worth emphasizing that this "identification exercise" was essentially evidence based and simply reflects the main trends emerging from the (INS) data analysis. Specifically, the identification of specialization opportunities draws on the Structural Business Survey data (for the 2008-2010 period) and follows a three step approach. First, the top 10 NACE 4 digit sectors in value added share are identified for each cluster under analysis. Second, (average) outcome measures (labor productivity growth, turnover growth, employment growth and value added growth) are examined for each of the top 10 sectors. The

[35] In this assessment, the term "cluster" refers to a precise set of NACE sectors, as defined by the ADR-Vest. See Annex 1 for the exact definition of clusters.

NACE 4 digit sectors – among the top 10 – that present an annual productivity growth rate that is higher than the average for the whole sector and simultaneously show a positive performance for at least two of the remaining outcome variables under analysis (employment, value added and turnover) are selected. Third and finally, the capacity to generate value added is examined and the average labor productivity of each selected 4 digit activity is benchmarked against the average for the whole sector.[36] Besides this set of analytical criteria, the identification exercise prioritizes potential cross sectorial links (especially regarding the ICT sector) and, to the extent possible, does not involve the ad-hoc selection of particular activities based on exogenous (and potentially biased) criteria. The following table summarizes the high growing subsectors (NACE 4 digit) that have emerged from data analysis for each one of the clusters.

Table 15: Specialization opportunities by cluster

Cluster	Opportunities
Automotive	Manufacture of Other Electronic and Electric Wires and Cables, and Manufacture of Other Rubber Products, new solutions for mechanical engineering, motor vehicle transport, etc.
Textiles	Manufacture of Underwear, Manufacture of Other Textiles N.E.C., Manufacture of Other Knitted and Crocheted Apparel, and Manufacture of Non-Wovens and Articles Made From Non-Wovens, Except Apparel, new solutions for mechanical engineering, CAD or Computer-aided design, etc.
ICT	Manufacture of Communication Equipment; Manufacture of Computers and Peripheral Equipment; Other Information Technology and Computer Service Activities; Data processing, hosting and related activities; Computer programming activities; Web portals; Computer programming activities; networks of the future, networked marketing and media and 3d internet, flexible organic and large area electronics, personal health and preventive care systems, research and innovation IT network, etc.
Agro food	Collection, Marketing, Processing and Preserving of Meat, Fruit and Vegetables; Crop science and food biological science, food procession bio technologies, etc.
Construction	Engineering and technology, energy efficiency materials, innovative building materials, joining technologies, conversion of wood waste, conversion of hard coal waste, environmental engineering, among others
Tourism[37]	Spa & wellness tourism; Urban & MICE tourism; and Ecotourism and active tourism, Natural resources for anti- age and medical tourism, etc.

79. **It is worth emphasizing that the identification of specialization opportunities for each cluster is limited to the level of sector/activities. It does not encompass products.** Two main explanations lie behind this approach. First, the firm level data used for this analysis does not provide information regarding the set of specific products that are produced by each firm. The SBS dataset provides only the NACE sector under which the firm is classified. Second, since the analysis is ultimately focused at the regional level, which limits the universe of firms under examination, any selection of products for potential specialization would inevitably imply the "selection" of a very small number of firms.

[36] Overall, the identification of specialization niches must be caveated by the available time frame: as the INS data covers 2008-2010 time horizon, the analysis reflects the immediate post crisis scenario and, for this reason, should be cautiously interpreted.

[37] The tourism cluster was the only one for which the identification of specialization opportunities has not drew on data (NACE 4 digit) sector analysis.

80. **In addition, whereas the firm-level data analysis has pointed to some high growth activities, the suggested areas for policy intervention will focus primarily on actions that can enhance growth potential at the level of the cluster as a whole.** This is because interventions focused on subsectors at the NACE 4-digit level would inevitably benefit a very small number of firms. It is worth emphasizing that policy makers must avoid using a "picking winners" approach since the role of a smart specialization strategy is to promote the role of the knowledge factor in economic growth, and to act as a flexible system that endorses iterative learning, but not to focus on specific economic activities.

81. **Each cluster has its own constraints and specificities that will shape the future development of specialization niches. For the automotive cluster, the overarching challenge is to diversify towards higher value added activities**, which requires moving up a very hierarchical structure of the international value chain. In this case, key conditions for upgrading are the creation of a well-developed base of local suppliers, with capable management, which is able to produce high quality parts and components; a well-developed labor market, producing highly skilled but relatively cheap technical experts; and a system of local R&D and innovation to develop prototypes or to produce customized parts and components.

82. **For the textile cluster, the overarching challenge is also to increase value added.** Hence the best way to upgrade for West Romania firms is to move upstream or downstream from central low value added activities and to build the skills and capacities for firms to start producing their own design or brand.

83. **For the agro-food cluster, improving the marketing of local products and establishing linkages with large distribution chains emerge as the main requirements in the short term,** given the complex features of the value chain, where the largest share of innovation (and value added) is generated by buyers. In the long term, the upgrade towards higher value added products should be accompanied by efforts in applied R&D as global experience shows that those countries which managed to obtain the biggest value addition from their food production invested heavily in basic and applied research. Another set of challenges encompasses the lack of an efficient irrigation system, the lack of testing laboratories and an incipient network of storage facilities and warehouses.

84. **For the ICT cluster, generally regarded as an internationally competitive player in the area of software development, the biggest challenge is to expand the current set of activities and overall productive capacity.** In order to achieve this, it should succeed in: enhancing the pool of skilled labor, which is in shortage in the region; creating a good environment for startups; develop business accelerators and adapt incubators to the needs of the ICT sector; helping firms connect with global customers; enhancing linkages and interactions with downstream (user) sectors; and improving the patenting policy.

85. **For the construction cluster, the challenge is to better explore the local availability of construction materials and to increase the use of energy efficient materials and technologies, which, although encouraged by the European Union, is not yet widespread in the region.** The rates of activity for the construction sector have decreased steadily since 2008 as a result of the economic crisis. As a result of the retrenchment in private sector investment, the government has become one of the most important clients for construction companies in the West Region. Discussions with companies in the sector suggest that over the past few years, government infrastructure contracts, which have been awarded primarily according to the lowest price technically acceptable criteria. Against this background, the use of, often costly, resource efficient materials and technologies is not sufficiently developed as construction firms are highly dependent on the client market.

86. **For the tourism cluster, more attention at the political level is key if the West Region is to take full advantage of its natural and cultural endowments.** The lack of destination management organizations at regional, county and local levels reflects the absence of a common integrated strategy which has negative consequence including an unjustified competition between complementary destinations such as Timisoara and Arad. Unclear ownership rights for the historical and cultural patrimony which can result in restricted access to European funds due to ownership problems and non-eligibility of concession grants by the management authority. Other bottlenecks include reduced public administrative capacity for complex investment tourism-related projects, and the lack of regional integrated tourism products to be sold on local and foreign tourism markets.

87. **Against this set of challenges, some broad policy areas can be identified.** To the extent that distinct degrees of information about economic specialization imply different chances of success with policy targeting. The following sections suggest general areas for policy actions that aim to enhance the growth potential of the region**.** Some of the suggested actions encompass horizontal areas that are common to all sectors, while other are sector specific. Chapter 5 will follow a more practical approach while drawing on the thematic objectives established by the European Commission for the 2014-2020 programming period; it will propose investment priorities that best fit the specific development needs of the West Region, as well as concrete competitiveness and smart specialization regional projects to be supported under these investment priorities.

IV.2. Horizontal policy areas that impact West Region economy

88. **The identification of the main horizontal policy areas results from the combination of a consultative process with private sector representatives - drawing primarily on interviews with sample firms in the target sectors – and analytical results provided by the previous analytical reports under this project.** As a consequence, this section highlights the perception of the private sector on the main bottlenecks for economic growth. Horizontal policy areas (outlined below) represent obstacles to economic development which have a significant impact on growth at the regional level and across sectors.

- ***Skills (1) The link between tertiary education and the workforce and lifelong learning***

89. **Despite education and skills often being perceived as a source of comparative advantage for the region, in fact the region faces important shortcomings at all levels of training and skills development.** The findings of the World Bank report "Territorial Assessment: Profile, Performance, and Drivers of Growth" shed some light on two important challenges for the improvement of skilled level.

90. **The link between tertiary education and the workforce must be reinforced.** The region must do a better job of leveraging its significant tertiary education infrastructure, especially to the insertion of university graduates into the labor force, avoiding common problems of mismatch between educational supply and labor demand and overeducation. This will require investments to improve the links between universities (as well as vocational training facilities) and employers. It may also pay to make strategic investments in promoting disciplines and skills that are likely to be the cornerstones of the region's future economy.

91. **Lifelong learning is another important area for policy action.** Lack of investment in lifelong learning makes the region's labor force unable to adapt to changing skills requirements resulting from shifts in industry structure and technology. The result is high levels of structural unemployment (and low participation rates) and skills mismatches at all levels of the labor force. Putting in place incentives for

individuals to invest in lifelong learning, and ensuring that the infrastructure and services (public and private) are there to support it, will be an important priority for the region.

- ***Skills (2): Vocational school system for industry-relevant training***

92. **Consultations with businesses revealed that the limited attractiveness of technical schools in the region (and in the country) constrains the ability of firms to increase productivity or to expand.** Though TVET program is in place for years, recent numbers suggest the region is lagging behind at least in terms of enrollment (see Figure 24, Figure 25 and

93. Figure 26). In addition, consultations with private sector firms in the region reveal that the number of technicians who can operate advanced machinery and equipment is decreasing rapidly and their average age is increasing. This problem affects all the sectors that were evaluated during this study, including textiles, agro-food, automotive, or construction, although to a lesser extent ICT (particularly software development, which is primarily a high-skill sector). Moreover, a number of companies complain that many of the training programs offered by human resource service providers and sponsored by EU funds have not been of poor quality and not relevant for the market.

94. **In order to support a sustainable industrial development in Romania for the medium and long term, it is critical that policy makers focus on this type of learning institutions in the near future**. .The curriculum for vocational schools should be developed based on consultations with the private sector at a national and regional level. In addition, this type of training should be appropriately funded and students should have access to modern machinery in order to be able to obtain industry-relevant knowledge. This approach will ensure that new graduates acquire a skills set that meets the demands of the market and that they are successful in finding employment.

- ***Skills (3): Entrepreneurial and business management skills***

95. **A concern highlighted in interviews with R&D stakeholders as well as with the private sector, was the lack of entrepreneurial and business management know-how.** For example, in many cases engineers or researchers do not have the ability to translate innovative ideas into commercially viable projects. Similarly, existing small firms or local producers which aim to become suppliers for multinationals are not successful in presenting their products in an attractive manner or creating a brand. Business development and management training programs are essential in preparing firms and entrepreneurs to compete on a national and global level. This type of training should be offered through the university curricula (including a focus on presentation skills), as part of incubator services, or be provided to entrepreneurs through specialized programs at the local level.

- ***Local infrastructure: road and rail transport***

96. **Infrastructure connections to the capital (and the rest of the country) remain poor, and virtually every settlement in the West Region is closer to either Budapest or Belgrade than they are to Bucharest, and.** While the region has long benefited from its westward orientation, the increasing pull of Bucharest in the national context makes it increasingly important for the West to improve its physical connections and its network to Bucharest – key to this is addressing the still major transport infrastructure gaps. 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.

97. **Improving internal connectivity with the region's main urban agglomerations, particularly with the Timișoara-Arad conurbation, is critical for addressing territorial disparities in the West Region.** 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 presented in the World Bank report "Economic Geography Assessment: Territorial Development Challenges in the West Region" (2013) show that Timisoara has the largest population outside of Bucharest within a one hour commuting distance.[38]

98. **Infrastructure to facilitate connectivity between Timisoara-Arad and more peripheral parts of the region is also important.** Recent investments by some of the existing large automotive companies to establish second plants in Hunedoara and Caras-Severin suggests there may be scope to attract significant labor intensive production in lagging parts of the region. As part of 'two-tier' strategies by some of these multinationals (where they concentrate research and other high skill activities in Timisoara-Arad and shift labor intensive production to other parts of the region) this obviously represents a huge opportunity to address both sides of the regional challenge. Improving transport connectivity of these regions so that shifting managers and engineers back and forth between regional head offices / technical centers and plants will be important to make such a strategy effective. There may also be a need to invest in industrial infrastructure and/or improve the operating efficiency of existing industrial parks.

99. **Interviews with firms in all the target sectors have confirmed the need to improve infrastructure connectivity.** The poor quality of the local road infrastructure affects firms in all sectors. Companies which use their own vehicles for transportation of products or supplies mention the increased wear and tear of the trucks and delays in delivery, leading to increased costs and loss of competitiveness. In addition, transportation of workers is problematic for large scale manufacturing activities. A large proportion of blue collar or low skilled workers commute to the production plant from surrounding areas and often there are no public transportation options available to them. Large companies provide transportation for employees using company buses but this leads to increased production expenses and traffic congestion.

100. **In this context, local authorities could begin by enhancing the quality of the roads in rural and remote areas.** This would not only improve the access of the population in these locations to urban centers but could facilitate the expansion of manufacturing activities to more impoverished areas of the West Region. The new infrastructure could also support the development of ecotourism activities in natural and national parks. In addition, constructing a ring road for the city of Timisoara and extending the connection with the highway would reduce transportation time and costs. Moreover, extending the network of public transportation to better serve the needs of the companies in the region

[38] Comparing the potential impacts of improved connectivity across the four main agglomerations in the region 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.

and of their employees would make the region more attractive to potential investors. In addition, enhancing regional mobility by connecting secondary and tertiary nodes to TENT- infrastructure is also important and a key issue for EU services.

- ***Access to finance***

101. **Discussions with the private sector in the West Region indicate that many firms perceive the lending conditions and interest rates required by banks in Romania as a significant constrain to growth.** The amount of collateral necessary for EU co-financing can be prohibitive for smaller firms. As a result of these financing conditions, many companies opt to use internal funds to purchase new machinery and invest in technological upgrading. However, this approach does not allow most businesses to grow at a sustained pace and limits their capacity to expand operations and compete within a larger European or global market.

102. **The private sector faces innumerous challenges to access financing.** A significant proportion of the companies in the West Region interviewed as part of this evaluation mentioned that they had used European Structural Funds for the 2007 - 2013 programming period and expressed their intention to apply for this type of financing in the upcoming programming period. However, the consultations highlighted a number of challenges regarding to access to EU funds. Some firms consider this type of financing unaffordable because it requires significant co-financing[39], which may be difficult to obtain from the banks (see above). The application procedures often lack transparency, and national or local authorities may impose additional requirements that can render the process lengthy and cumbersome. Additionally, the evaluation period for an application can be very long. Companies that apply for funds to invest in new equipment can wait more than a year for the decision, which in some industries can render a particular technology obsolete. In addition, other firms complained that reimbursements for investments pre-financed by the company may extend past the date specified in the contract.

103. **In order to provide effective support to the private sector, non-reimbursable funds (including EU funds) should be made available according to clear and transparent guidelines,** which take into account market dynamics and are applied in an efficient manner by officials with basic knowledge of the industry. The evaluation process should be streamlined so that funding decisions are communicated to applicants within a reasonable period of time. Reimbursement of funds should be processed in an expedite manner so as to avoid the potential negative impact which this type of delays can have on a firm's cash flow and operations.

- ***Improving the institutional framework supporting innovation***

104. **The current institutional framework which supports the regional innovation system encompasses both national and regional bodies.** According to Law no. 315/2004, the regional institutional framework consists of the Regional Development Council (which includes the Presidents of the County Councils and the mayors of some localities from each county) and the Regional Development Agency, an executive body of the Regional Council, responsible for policy implementation. The activities of the Regional Development Agencies are coordinated at national level by the Ministry of Regional Development and Public Administration, which is also responsible for the coordination of the National Council for Regional Development. This national Council, theoretically, is composed of the representatives of the regional councils and representatives of the Government and has the main

[39] The significant level of co-financing is imposed by the state aid rules. Either the company borrows the whole amount for the necessary investments, or it takes advantage of the EU resources and invests only some reimbursable funds to get to the same results.

responsibility of approving the national strategy for regional development. Nevertheless this committee has not been active for a long time. According to this Law, the main objective of the regional development policy is to correlate the sectorial policies and increase the competitiveness of Romania.

105. **At the national level, there is a myriad of institutions responsible for research, technological development and innovation.** The Government Decision 185 from April 2, 2013 lays out the structure and responsibilities of the Romanian Ministry of Education (the national coordinator for education, research and development, and innovation)[40] and its key national structures[41]:

- Directorate General for Research, Technological Development and Innovation
- National Council of Scientific Research
- Consultative College for Research, Development and Innovation
- National Council for Ethics of Scientific Research, Technological Development and Innovation
- Executive unit for financing research, development and innovation
- National institutes for research and development in fields such as: eco-industry, micro-technologies, turbo-motors, electrical engineering, energy, environment protection, mechanics and materials, textile, leather, agro food and bio-food – products, machine and technologies, tourism, etc.

106. **Cooperation between national and regional institutions is weak, which has had a negative impact on knowledge management in the region**. In Romania, the majority of policies are designed at the central level, by ministries or national agencies, while services are provided at county level. However, there is insufficient cooperation between regional and national authorities. This lack of coordination has had a negative impact on knowledge management in the West Region. The research undertaken at knowledge generating institutions, predominantly the RDIs, does not seem to be marketable, nor does it meet the demands of the private sector.[42] Authorities and policy makers should consider consolidating the existing RDI system and introducing measures to increase the quality of research at the remaining institutes. Privatizing some of the RDIs and channeling funds away from basic research towards the "innovation" side would be beneficial.

107. **The Regional Development Agency emerges as the key institution with the capacity to connect national and local stakeholders** and help to improve the regional innovation system (see Box

[40] The Ministry of National Education is responsible for the preparation and monitoring of the National Plan for Research, Development and Innovation.

[41] The Government Decision 185/ 2013 does not mention how these structures can cooperate with the Ministry of Economy, Ministry of Regional Development and Public Administration and with the regional structures in designing and applying of the research, development and innovation policy.

[42] According to World Bank report "Smart Specialization Case Studies", recent information from the Regional Innovation Union Scoreboard (2012) shows a mixed performance for the West Region in terms of EPO patents. While in comparison with the other regions in the country the West Region appears to be catching up with Bucharest, it is drastically lagging behind comparators in the rest of the EU in terms of intellectual property protection for its inventions. During the interviews conducted as part of this analysis, the high costs of hiring patent attorneys emerged as the main reason for the low score in international patenting. A secondary reason was the lack of "vision" and knowhow necessary to approach international bodies in order to apply for patents and to exploit their commercial value to the fullest extent. Even in cases where an EPO or USPTO patent is granted, stakeholders in the region do not have much experience with licensing and not sufficiently aware of the potential gains from such activities. In most cases, the overall costs of patenting are believed to exceed the benefits, partly due to the lack of clarity in the rules governing the ownership of intellectual property.

2). RDA West could coordinate with the relevant national institutions in order to support the smart potential of the region, while ensuring that the regional needs are attended at national level.

108. **The establishment of two regional committees, managed by the RDA, can introduce a new partnership format to promote cooperation between national and regional policy makers. The first would be the *Regional Innovation Committee*.** This new administrative body would include all the key stakeholders in the region, would hold quarterly meetings and design common projects, bringing on board the national R&D structures and policy makers. Its main role would be to identify the legislative and policy bottlenecks that preclude the development of research and innovation in the region, and to promote adequate measures at the national level. The Regional Innovation Committee would propose an action plan to increase local competitiveness and monitor its implementation. In addition, it would ensure a close and ongoing cooperation with the national structures responsible for research, innovation and development.

109. **Relevant topics that could be discussed by the Innovation Committee include the design of technology transfer offices and co-financing of patent applications.** To strengthen the collaboration between the private sector and research institutions (universities and RDIs), the West Region could establish technology transfer offices (TTOs), either as part of universities or industry-specific. TTOs could help identify research projects with commercial potential and carry academic ideas to the market. Technology transfer can take the form of a licensing agreement between the academic researcher and a private firm, or of a spinoff company established with the participation of the main scientist involved in the project. The functions of such offices should be carefully designed to avoid creating yet another layer in the bureaucracy, additional paperwork, and delays. The sole function of a technology transfer office should be to facilitate the commercialization of academic research and to promote applied research in universities and RDIs. Second, in order to alleviate the burden of acquiring intellectual property protection for inventions, co-financing of patent applications could provide support to RDIs in the West Region, some of which have tried to apply for a patent (in fields such as textiles, construction, or energy efficiency), but have been unable to cover the full costs of the application.

110. **Second would be the *Human Capital Committee***. It would encompass the main drivers and providers within the education system in the region, representatives of the private sector and national policy makers in the areas of education and the labor market. The main role of this group would be to adjust, update and modernize the curricula for theoretical education, vocational training and lifelong learning in order to answer to the demands of the business sector in the region. Representatives of the Ministry of Labor and the Ministry of National Education should be part of this Committee.

111. **Administrative support for these new structures could be provided in two ways. First is through the creation of an innovation center for West Region.** The center would act as a strong and permanent partnership between universities, R&D centers, and industry, working together to increase regional competitiveness. Building on the existing innovation support structure (TEHIMPULS)[43], the center could be reorganized as a separate agency (non-profit organization) based on a public-private partnership among the County Councils and the Chambers of Commerce. Alternatively, it could continue to function as a department at the level of the RDA West, as is currently the case for TEHIMPULS.[44]

[43] TEHIMPULS is an office established in 2006 as part of the West Region Development Agency (ADR Vest) to act as an interface between the regional actors in the innovation system. (see proposed project 1)

[44] One possible function for the Regional Development Agencies is to monitor the implementation of the growth poles development plans for the 7 growth poles cities (Timisoara, Iasi, Ploiesti, Constanta, Craiova, Cluj and Brasov); in this case it would encompass the growth poles coordinators (whose activity is financed from the

112. **Second is by extending the scope and strengthening the role of the Regional Pact for Employment and Social Inclusion.** This Pact, set up by the Ministry of Labor, would continue to liaise with policy makers and raise awareness regarding the most critical challenges in the area of education and training programs.

113. **Finally, the Regional Development Council would hold quarterly meetings with the coordinators of the two new committees, seeking to ensure the efficient functioning of the knowledge management process at the regional level.** It is also important to acknowledge that while the suggested creation of these two regional committees might enable the region to better bundle forces, there is always the risk of creating an additional level of bureaucracy, if these measures are not linked to a simplification of structures, i.e. the abolishment of other bodies whose tasks are taken over by the new committees.

114. **Partnership structures such as those suggested by the report (as the Regional Innovation Committee) are a type of cooperation mechanism which has been successfully used in other European countries.** These structures include representatives of both public and private sector could have an important impact on the development of a certain area or economic sector as the public policies and funds are correlated with local needs, initiatives, and funds. Such structures are functioning well in other European Countries, but nevertheless depend very much on the commitment of both public and private bodies involved. The Enterprise Ireland provides a successful model of organization for this purpose (see Box 2).

Box 2 - Enterprise Ireland

Enterprise Ireland is the government organization responsible for the development and growth of Irish enterprises. It works in partnership with Irish enterprises to help them start, grow, innovate and conquer market share on global markets. The organization provides supports for both companies and researchers in higher education institutes to develop new technologies and processes that will lead to job creation and increased exports.

Enterprise Ireland is a body corporate established by the Industrial Development (Enterprise Ireland) Act, 1998. As a statutory body, it is endowed with a separate legal personality and perpetual succession. It also has the capacity to own property, make contracts, sue and be sued in its corporate name. The members of the Board of Enterprise Ireland constitute the members of the agency. The agency operates in accordance with the provisions of the Industrial Development Acts 1986-2009 and under the aegis of the Minister for Jobs, Enterprise and Innovation who is empowered to provide funds to the agency to enable it to discharge its obligations; to issue general policy directives; and to seek information on the agency's activities.

The Board is responsible for setting the broad strategy and policies of the organization. It is responsible for the system of internal financial control and for putting in place processes and procedures for the purpose of ensuring that the system is effective. The Board also has oversight responsibility for the activities of the organization. It delegates to management and sub-committees the responsibility for their implementation. The Board has also statutory authority to approve funding up to the levels set out in the Industrial Development Act, 1986, as amended, and the Science and Technology Act 1987 and to make recommendations to Government on funding support above these levels. The Enterprise Ireland Board and its relevant committees have the authority to purchase shares (ordinary and preference) in client companies. Under the terms of the Industrial Development (Enterprise Ireland) Act 1998, all functions and powers are reserved to the Board, save those that the Board formally delegates. All powers so delegated are set down and are formally approved by the Board.

In its own activities and in its use of subcommittees, the Board operates towards best private sector

Technical Assistance Operational Programme) under its structure. The activity of this team could be extended to be fulfilled the needs for a regional coordination of the research, development and innovation activities.

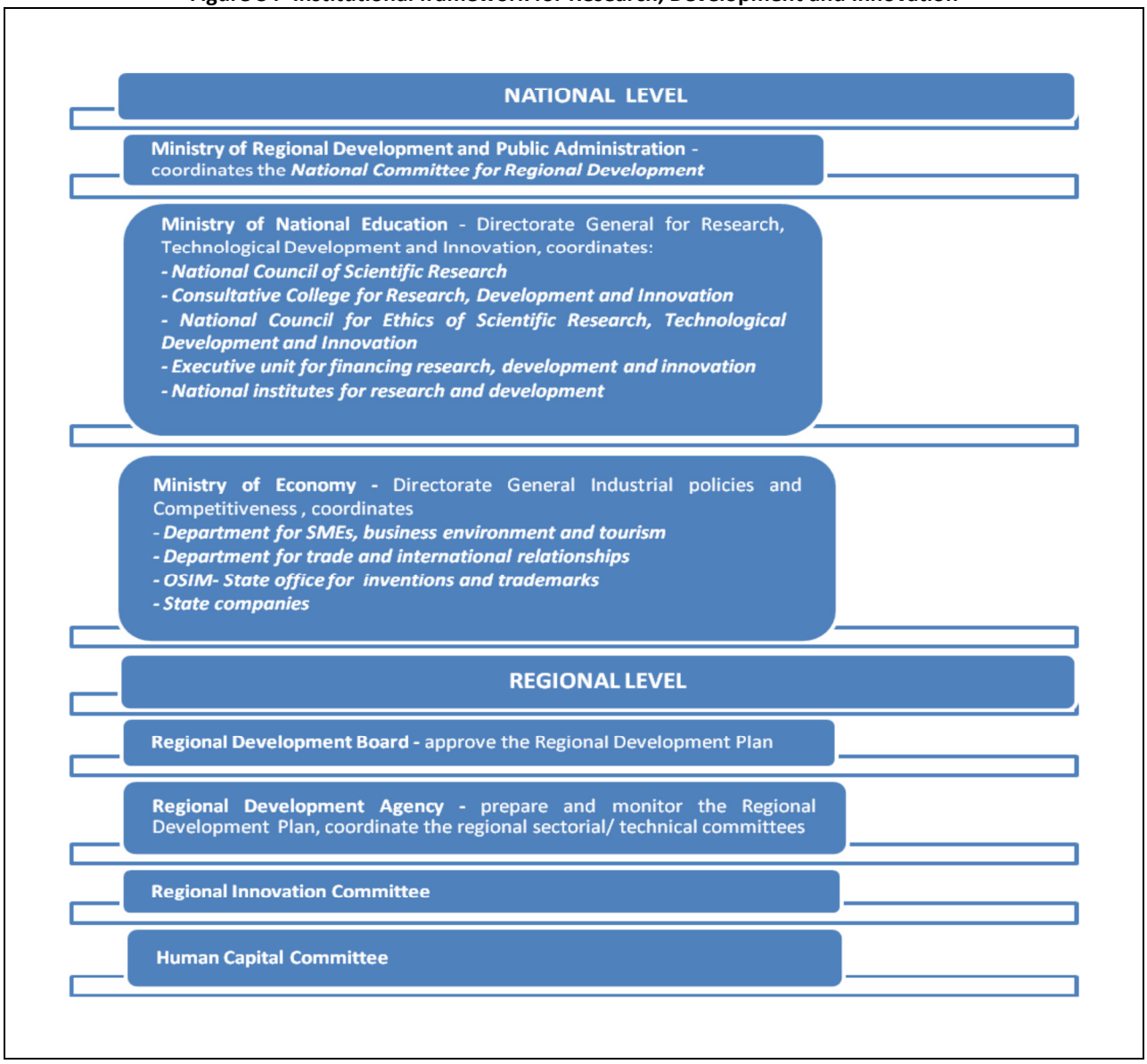
corporate governance principles. In accordance with the Ethics in Public Office Act, 1995, and the Code of Practice for the Governance of State Bodies, Board members are required to provide a Statement of Interest to the Standards in Public Office Commission and to the Secretary. Enterprise Ireland fully complies with Government policy on the pay of Chief Executives and State Body employees and with Government guidelines on the payment of fees to Board members. Board members are appointed by the Minister for Jobs, Enterprise and Innovation, with the consent of the Minister for Public. Expenditure and Reform. Each year, on the anniversary of the Establishment Day, the two members (other than the Chairman and Chief Executive) who have been longest in office since their last appointment retire from office. New Board members, on their appointment, are provided with extensive briefing on the agency and its operations.

Examples of sub-committees include:

- The *Investment Portfolio Review Committee* has responsibility for overseeing the management of Enterprise Ireland's investment portfolio and for maintaining an oversight of the investment activity of funds supported by Enterprise Ireland under the various seed and venture capital programmes.
- The *Innovation Fund Ireland Committee* considers and recommends to the Board applications for funding under the Innovation Fund Ireland Scheme.
- The *Executive Committee* manages and controls the administration of Enterprise Ireland's budget, monitors progress against organizational targets, and considers matters of corporate policy, including financial product guidelines, sectoral policies and strategies, regional strategy, and new and amended programmes and schemes.
- The *R&D Committee*: Enterprise Ireland's approach to R&D and innovation is guided by the Government's Strategy for Science, Technology and Innovation, 2006-2013, which is coordinated by the Department of Jobs, Enterprise and Innovation. The R&D Fund was launched in early 2008 and is designed to provide support for research, development and technological innovation relevant at all stages of company development. It provides support to enable companies to progress from undertaking an initial research project to high-level innovation and R&D activity.

115. **Finally, the Romanian Government could improve the specific legislative framework related to regional policy and innovation support if similar structures are set up in all the regions**. In case the partnership structures such as those suggested in the report are set up across regions there is need to adapt specific legislative framework related to regional policy and innovation development in order to ensure an integrated institutional system. Specific objectives and responsibilities could be given in this context to both central and regional structures. Against this backdrop, the proposed institutional framework for Research, Development and Innovation is presented in the figure below.

Figure 34- Institutional framework for Research, Development and Innovation



IV.3. Sector specific smart policy areas in West Region

116. **The cluster-level assessment highlights areas for policy action that can support the development potential of these activities.** It is worth stressing that, whereas the firm-level data analysis points to high growth sectors as well as subsectors (NACE 4 digit) in the region, the specific areas for policy intervention focus primarily on actions that can enhance growth potential at the level of the cluster as a whole. As already emphasized, this is because interventions focused on subsectors at the NACE 4-digit level would inevitably benefit a very small number of firms. Moreover, the goal of a smart specialization strategy is to expand the role of knowledge and innovation in economic growth, rather than to try "outsmarting" the market.

IV.3.1. Automotive

117. **The establishment of research institutes and testing laboratories can help the automotive sector to grow in the medium term and remain globally competitive**, and can support firms in the West Region to increase levels of value added through the incorporation of more knowledge and technology in production. Although there are many foreign MNCs in the region, the transfer of technology and knowledge to local firms is insufficient, mostly due to the nature of the tasks undertaken by local firms. The establishment of research institutes and labs will incentivize local firms to prepare prototypes, test their new designs, products and processes and help them to become included in the global supply chain of MNCs. Once a firm becomes part of a supply chain, learning and spillovers are likely to be accelerated. The labs will also provide opportunities to conduct more frequent quality tests which will increase reliability of local producers.

118. **Increasing awareness regarding the activities of the auto cluster initiatives in the region is also relevant.** Expanding and increasing the awareness of the auto clusters initiatives (like the Automotivest) would stimulate exchange of ideas, sharing of experiences and would help local producers become better and more connected with the large players.

IV.3.2. Textiles

119. **Closing the gap on financing for the acquisition of productive investments in new technology and machinery plays a key role for the textile sector.** In order to increase the value added generated by the sector, and to be able to enter new export markets, textile firms in the West Region should expand their production to include more knowledge and technology-intensive activities that will allow them to generate new designs and products. These activities will require the use of advanced technology and equipment that can be prohibitively expensive for many local companies, which have difficulties in accessing external finance. To close this gap on financing, the government can provide tax incentives, subsidies, or better financing terms on productive investments, especially on acquisitions of new technology and machinery.

IV.3.3. Agro food

120. **The authorities should develop targeted initiatives for SMEs to help develop sector-specific support infrastructure for improving quality, health and safety standards**, SMEs financing initiatives, marketing initiatives such as the development of a regional brand, or training in marketing or sales. These measures will help build capacity in the sector and could be very helpful in enhancing the competitiveness of West Region food producers. In addition, measures to support the association of small scale farmers could greatly improve access to finance, production sustainability for food processors, lower food processing costs and help to provide more robust employment in rural areas.

121. **Public policy should also strengthen basic and applied research.** The largest share of innovation and value added in the agro food sector is generated by suppliers through the provision of new machinery, new seeds, new chemicals and fertilizers, and more recently by the application of ICT to agriculture. Therefore, public policy should support innovation in the industry, especially as food engineering, agriculture, and veterinary sciences are areas of strength of the West Region universities.

IV.3.4. ICT

122. **The services offered by incubators and business accelerators should be expanded.** While there is agreement regarding the usefulness of incubators and business accelerators, it was highlighted during discussions that in order to be useful these infrastructures also need to provide other services, such as information about the sector and the clients, assistance in drafting business plans, and advice regarding financing options.

123. **Mentorship programs should be structured more efficiently,** and the incentives for mentors have to be clear. These incentives can take the form of shareholding, or the right to subsequently participate in the ownership and management of intellectual property. Mentors also facilitate the firms' access to investors. There are different successful models for this type of activity, some of them (such as Endeavor) which operate in different countries and could be franchised to Timisoara.

124. **Angel investors could also accelerate the development of new creative companies.** In Timisoara there are several potential investors (i.e. angel investors) who are experienced, skilled and well-connected individuals that could provide hands-on support to entrepreneurs. There is space for public action to research the market and connect investors to new creative companies in need of funding.

125. **The development of links with global customers and with downstream user sectors is also important.** Match-making mechanisms and more efforts to market the West Region ICT sector to downstream users and global customers would also be necessary.

IV.3.5. Construction

126. **Policies to support the regional construction and energy cluster (ROSENC) are essential for the development of the construction sector.** The West Region cluster ROSENC can play a key role in promoting collaboration between state authorities, academia, and the private sector in order to encourage knowledge-exchange and support commercially sustainable projects to expand the production of energy efficient construction materials in the region, which could help reduce the cost of such inputs and increase their use in local infrastructure. Thus, increasing awareness regarding ROSENC's initiatives could help local firms increase competitiveness.

127. **Expanding the award criteria for government infrastructure tenders to include the use of energy-efficient materials is also a key factor to increase economic sustainability.** The authorities should encourage the use of energy-efficient materials in government infrastructure projects and should support the transition to nearly zero energy buildings. These measures would promote the use of energy efficient materials while helping sustain long term economic development.

128. **Finally, while the construction sector was classified as having unclear comparative advantage, creating an enabling environment for efficient market selection emerges as an additional useful measure.** This implies combining measures that promote firm entry and encourage startups (potential high growth firms) – and allowing firm exit.

IV.3.6.Tourism

129. **A tourism cluster can support cooperation between tourist stakeholders and between the tourism sector and different innovation actors.** Through its capacity to stimulate public and private

infrastructure development according to integrated and multi-sectorial area-based local development strategies, it can become a driving force for the development of related innovative associations and companies. The tourism cluster can act as a platform during the 2014-2020 programming period that can implement the smart specialization objectives by using policy tools to guide the European funds towards tourism integrated and sustainable projects with major externalities.

IV.3.6.1. Spa and Wellness Tourism

130. **The West Region could position itself as a pilot region in the field of anti-aging treatments.** This can be done through the specialization of town and spa resort treatment facilities towards prevention and anti-ageing therapy that will target seniors. Ana Aslan and Gerovital can constitute a starting base in the area of medical tourism. This offer can be completed by general medical check-ups, aesthetic light surgery, anti-smoking program, anti-alcohol cure, weight-loss program, etc.

131. **Regional spas should be promoted as cross-border medical tourism destinations.** The tourism cluster could manage the design of customized products for specific markets and could provide information and support to regional spa and medical treatment centers for their certification and accreditation process.

IV.3.6.2. Ecoturism and Active Tourism

132. **The West Region can become the first Romanian region to develop ecotourism destinations, as its natural heritage potential is one the most important of the country.** Ecotourism brings together rural tourism with active and adventure activities and fits with the recent evolutions on the demand side (especially on the European travel market). This form of tourism is based on a bottom-up development approach, providing not only sustainable development and the protection of natural and cultural heritage, but also a maximized local retention of economic benefits.

IV.3.6.3. Urban and MICE Tourism

133. **The organization of meetings and professional events is also an option to attract visitors.** Successful metropolitan areas have placed the tourism industry and events' management at the center of their tourism strategy or have invested in leisure tourism, meetings and professional events as part of a broader strategy.

134. **The cultural and event strategy can become a key element of the West Region tourism strategy.** Having an event agenda that is balanced and includes events in each season is an important aspect for an urban destination. Events constitute occasions to discover the traditional heritage of the city presented in a different manner. In addition, the organization of major events outside of the main touristic season can represent a good way to increase tourism flows during the low season.

IV.4. Overview of strengths, weakness and potential solutions

135. The following table summarizes the main strengths and weakness, and suggests broad measures to help tackle the main challenges of the West Region. The sector perspective is also outlined at the table and draws on the in-depth sector analysis presented by the World Bank Report "Smart Specialization Case Studies Report". Some of the solutions suggested below are quite specific and will be listed in Chapter 5 (and presented in Annex 2) as part of a set of potential investment pilot initiatives.

Table 16- Overview of weaknesses, strengths and opportunities for the region

Weaknesses	Strengths	Potential Solutions
	General	
Fruits of economic growth not distributed evenly across the region (income, wage and export disparities) The region the region faces important shortcomings at some levels of training and skills, such as technical and education Economic activity is increasingly concentrated by sector, firm size and firm ownership Export performance is very concentrated in EU markets and intensive in relatively low skilled and less sophisticated products Increasing integration with regional value chains has led to low value addition Increasing dominance of FDI with weak links across firms and to local suppliers Lack of cooperation between R&D institutions Limited information regarding the research sector, business and market opportunities, business support, national and local investment projects, etc Lack of adequate road infrastructure and transport connections particularly between business areas and rural communities	Physical endowments are reasonably plentiful and unexploited to some extent Two developed urban centers – Timisoara and Arad Relatively skilled population. Clear strength in tertiary education programs for natural sciences, mathematics, computer science, food engineering, agriculture, as well as medical and veterinary sciences Important signs of entrepreneurial activity Existence of a relatively good network of industrial and technology parks High export performance	Skills: improving the link between tertiary education and the workforce and lifelong learning; improving the vocational school system for industry-relevant training; and supporting entrepreneurial and business management skills. Local infrastructure: improving internal connectivity with the region's main urban agglomerations, particularly with the Timișoara-Arad conurbation, and improving infrastructure to facilitate connectivity between Timisoara-Arad and more peripheral parts of the region. Access to finance: increase the supply of non-reimbursable funds. *Development of regional investment funds (see chapter 5 and annex 2)* Improving the institutional framework supporting innovation *Establishment of an innovation center for West Region which could play a key role in promoting local innovation and ensure the regional partnership for development (see chapter 5 and annex 2)* *Pilot initiative on development solutions for the mining areas (see chapter 5 and annex 2)*
	Automotive sector	
Increasing participation in European value chain production has resulted in declines in the value added share of output in automotive sector, which shows evidence about the weak links between the foreign and	The relevance of the sector for the region has been tested and there is continuing demand for the output produced in the region.	Establish local research institutes and labs to support firms in preparing prototypes, and testing new designs, products and processes.

domestic firms in the sector. Although exports of auto parts have increased over time, this growth has been on the intensive margin. There is low contribution of new export destinations to export growth.	The geographic location of the region gives it a clear advantage over the rest of Romania through its close distance to EU market. Moreover accession to EU has streamlined trade relationships between Romanian firms and the rest of the EU member countries through establishment of bilateral and multi-lateral trade agreements and larger involvement in global value chains of production. Human capital with skill sets that are suitable for the sector's needs has been expanding in the region. Although it is still below the intended levels, there have been significant improvements in this area. The region still provides relatively low labor costs for automotive activities which is a major contributor to attract foreign multi-national corporations. Being one of the most developed regions in Romania (in terms of income per capita), West Region is in an advantageous position to focus on more knowledge embodied innovation and technological changes. Due to long years of interaction with the EU countries, business culture is more developed in West Region than many other regions in Romania as well as the neighboring countries who might become potential competitors in medium term.	*Establishment of a laboratory and innovation center for the auto industry (see chapter 5 and annex 2)* Introduce vocational school providing relevant training for the auto industry, endowed with appropriate technical facilities Increasing awareness regarding the activities of the auto cluster initiatives in the region
Textile		
Most of West Romanian firms are sole suppliers of foreign brands and have not managed to transition to their own designs and own brand	The textile sector has been in existence in the region for a long period. It is still one of the biggest employers and contributors to	Tax incentives, subsidies and better financing terms on productive investments, especially on acquisition of new technology and

manufacturing. The labor force currently employed in the sector is aging and it is difficult to find young workers interested in the business. This will force firms to increase wages which threatens many firms whose only comparative advantage is low costs. Given that textiles industry is typically structured as a buyer driven commodity chain, the need to upgrading for West Romanian firms in the sector will not be easily fulfilled as it requires following very well established patterns.	export in the region. A large body of industry-specific knowledge has been accumulated. Through their long term engagements with large production networks, local producers have learnt about how MNCs work, what quality standards they require, what technology they use, how they plan for production, their distribution channels for raw materials and finished products. Direct connections with many multi-national clients in the sector have helped build a business network in the region which can easily generate new business opportunities. The geographic location of the region gives it a clear advantage relative to the rest of Romania as well as to many other global competitors through its close proximity to the European market.	machinery as a way to support the development of new design or products Vocational school focused textile – relevant training with appropriate technical facilities *Establishment of a laboratory and innovation center for the textile industry (see chapter 5 and annex 2)*
Agro – food		
In the food processing and beverages activities, the main challenge in the short term seem to be increasing profitability, improving marketing, and establishing linkages with large distribution networks. Lack of an efficient irrigation network Lack of testing laboratories Lack of network of storages and facilities Limited information on new machinery, new seeds, new chemicals and fertilizes	Huge untapped agricultural potential. The region encompasses a rich (arable) agricultural land that has supported diverse agricultural activities, including cereals, horticulture, and animal production. However, the share of the region's land area that is utilized for agriculture is the lowest among all regions in Romania. Low wages Food engineering, agriculture, and veterinary sciences are areas of strength of the West Region universities Unexploited export opportunities with Serbia. Taking better	Support innovation in the industry, especially as food engineering, agriculture, and veterinary sciences are areas of strength of the West Region universities *Establishment of an agro-food market center including a regional accredited laboratory for food safety and veterinary tests (see chapter 5 and annex 2)* Vocational school focused agro – food industry – relevant training with appropriate technical facilities *Launch of feasibility study to assess the regional priorities for land irrigation (see chapter 5 and annex 2)*

The still uncompleted land and property reform and development of the land market continues to limit access to credit and has delayed the restructuring of farms in accordance with market demand and the need to enhance competitiveness	advantage of opportunities for trade with Serbia, especially in agricultural products, could be particularly important for parts of Caraș-Severin.	
	ICT	
The biggest challenge is to expand their activities (productive capacity) as a whole. Migration of the highly skilled workforce	Low wages Skilled workforce. A number of international firms have chosen Timisoara over other locations in order to capitalize on the local advantages in terms of skill availability, particularly mathematics and computer science which are areas of strength of the local universities, while enjoying the benefits of a EU location.	Expansion of services offered by incubators and business accelerators Support to mentorship programs Support the connection between angel investors and potential entrepreneurs (public action to research the market and connect investors to new creative companies in need of funding). Support the development of links with global customers and with downstream user sectors is also important *ICT competitiveness pole (see chapter 5 and annex 2)*
Construction		
Insufficient use of the local raw materials (building materials, stone, waste materials, wood and wood waste, marble, water, etc) Insufficient use of energy efficient materials Limited awareness regarding local energy efficiency projects	Energy and metallurgy– substantial reserve of coal and non- ferrous metals Experience in ironworks The availability local raw materials (building materials, stone, waste materials, wood and wood waste, marble, water, etc)	Support the development of energy efficient materials using local inputs and expertise *Establishment of an innovation center for green energies and energy efficiency (see chapter 5 and annex 2)* Increase awareness regarding local energy efficiency projects Combine measures that promote firm entry and encourage startups

		(potential high growth firms) – and allowing firm exit
Tourism		
Lack of appropriate infrastructure, services, and facilities Lack of local brand products Lack of integrated tourism service packages Low awareness at the political level regarding the potential and the needs of the sector	Very high potential for a diversified tourism offer Large unused natural resources – thermal water and mineral water, natural parks, important cultural and historical sites	Develop integrated tourism packages Use of national resources and regional brand products Develop eco-tourism and active tourism Develop appropriate awareness campaigns *Establishment of a center for protection and promotion of natural parks (see chapter 5 and annex 2)* *Geo therapy center*: *develop a network of regional spas and wellness centers combined with medical treatment and recovery, some of them outside urban areas or close to the National Parks (see chapter 5 and annex 2)*

V. Key elements of a smart specialization strategy for the West Region

136. **Meeting the two percent goal of regional GDP to be devoted to research and development would require substantial investments in the West region.** In the context of the Europe 2020 Strategy, basic simulations show that the West region should increase overall R&D expenditures by a substantial amount to meet this target. In 2010, the last year for which Eurostat provides data on regional R&D outlays, the total intramural R&D expenditures (considering business enterprise sector, government sector, higher education sector, and private non-profit sector) over GDP amounted to 0.22%. Assuming that this level was kept constant in 2011 and 2012, the 2020 target would be met if the overall R&D expenses (over GDP) increase at an annual average rate of 15% starting from 2013 (Figure 19). Following this trend, and applying the IMF projections for GDP in Romania[45] to the West region GDP, the related regional budget necessary to meet the 2% target in 2002 would need to increase from an average of 28.13 million Euros in 2011-2012 to 323.3 million Euros in 2020 (Figure 20). According to the partnership agreement, this 2% is to be shared equally between public and private contributions, which implies a 1% public contribution and a 1% private contribution. As a result, private sector investment in R&D in the region should be around 160 million Euro in 2020, a substantial increase from the modest 2010 level of 4.14 million Euros.[46]

137. **Drawing on the broad policy areas already identified, this chapter takes a practical approach and presents key elements for a smart specialization policy framework.** The West Region needs to address a number of challenges, some of which can be tackled at the regional level while others can be addressed as part of a broader national strategy. This chapter highlights a set of investment priorities tailored to the particular needs of the local industries and proposes actions that can be financed through the regional operational program or other programs for the 2014-2020 period. In addition, it draws attention to a number of horizontal, economy-wide areas of intervention that should be considered as part of the national strategies and national sectoral operational strategy.

138. **The majority of the measures outlined in this chapter lie outside the purview of regional authorities. Nevertheless, regional strategies can be used to advance regional needs at the national level.** In Romania there are currently no administrative structures at regional level (see Box 3), and consequently, no dedicated financial means for implementing comprehensive strategies.[47] The research and innovation policy, which encompasses the smart specialization strategy, will be designed and implemented at national level. However, some regions that have had a good experience in drafting and implementing strategies for research and innovation, as is the case of the West Region, are opting for developing the regional strategies for smart specialization. The regional smart specialization strategy can be used for "lobby" purposes, as well as an input for a broader regional development plan. It will not be incorporated directly into the national strategy. However, the smart specialization strategy at national level should, in principle, be correlated with the regional ones (in cases where these exist). These strategies can be used to advance local needs and priorities at the national level, and to support discussions with decision makers at county level and potential investors.

[45] For references on the IMPF projections for Romania GDP, please see International Monetary Fund, World Economic Outlook Database, April 2013. http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/index.aspx.

[46] Source: Eurostat data (rd_e_gerdreg)

[47] Although there are no dedicated financial means, the region can identify financing resources in specific cases (e.g. certain programs financed from EU Funds, such as the Regional Operational Program).

Box 3- The Role of Regional Development Agencies in Romania

The territorial organization of Romania encompasses 41 counties and the municipality of Bucharest. Counties (as well as cities and communes) constitute the administrative structures at the local level.. For the purpose of regional policy objectives, the counties have been organized, since 1998, in eight development regions, based on a convention among the designated counties. Currently, the eight development regions of Romania do not constitute administrative structures.

According to Law No 315/2004 on regional development, the regional development agencies (RDAs) are set-up as non-profit organization of public utilities acting in the field of regional development. Their activity related to regional development is coordinated by the ministry in charge with the policy management, while the functional status is approved by a Regional Development Council (RDC).

The regions represent the framework for programming, implementing and evaluating the regional development strategies. The RDC is the decision body at regional level, organized on the partnership principle of the county representatives, while the RDA is the executive body acting to implement the regional policies.

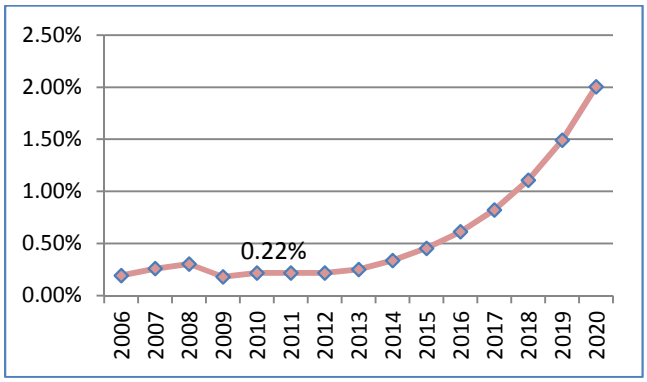
In order to perform the regional development activities, the RDAs are entrusted with responsibilities such as: drafting and monitoring the regional development plan (according to Law No 315/2004) and performing tasks delegated by the national Managing Authorities[48] in order to ensure the management of funds, including EU funding and resources provided through national programs. Besides these horizontal tasks, RDAs are involved in different activities at regional level such as: coordination of growth poles integrated programs, coordination of innovative clusters[49], and other similar organizations.

Acting as an executive body at regional level, the RDAs fulfill the role a mobilization and mediation actor among different stakeholders in the region. For those policy areas where the RDA is not directly responsible to ensure funding, the RDAs can be a catalyst for the actors in the region in order to help identify funding opportunities and to offer guidance to key initiatives in the region. According to Law no 315/2004, the RDAs, with the support of RDCs, work to attract funding in order to implement their activities. RDAs also identify and promote (acting in partnership with other stakeholders) projects of regional and intraregional interest, and develop relationships with international bodies for promoting the regional interest.

[48] For the programming period 2007-2013, the RDAs have been designated Intermediary Bodies for Regional Operational Program (integrated program at national level managed by the Ministry for Regional Development and Public Administration) since the beginning of the financial exercise. In the meantime, at the end of 2012 RDAs have been designated as Intermediary Bodies for Sectoral Operational Program Increase of Economic Competitiveness for the SMEs financing operations.

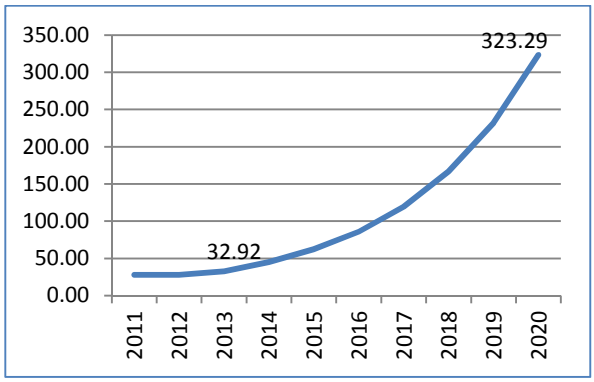
[49] See TEHIMPLUS and AutomotiVEST in case of RDA West.

Figure 35: Total intramural R&D expenditures over GDP in the West Region Romania: projections 2013*-2020



Source: World Bank staff simulations based on Eurostat and IMF data. *Note: the latest available data for R&D over GDP indicator for the West region is for 2010; 2011 and 2012 levels are assumed to be the same.

Figure 36: Total intramural RD expenditures (million Euro): projections 2013-2020



Source: World Bank staff simulations based on Eurostat and IMF data.

139. **Building on the analysis conducted as part of this assessment, this chapter drafts inputs for smart specialization strategy organized under three main policy areas: research and development, support for SMEs, and education**. Even though the need to improve regional transport infrastructure has been highlighted by the analysis and during consultations with the private sector, the chapter does not provide detailed measures for infrastructure enhancement due to the fact that infrastructure investment priorities are eligible for EU co-financing in the 2014-2020 period *onl*y if linked to a national transport master plan, which is out of the scope of this assessment. The chapter focuses on thematic objectives (TOs), as established by the Cohesion Policy for the 2014-2020 period. It then sets the priority axis and the investment priorities that can be promoted at the regional level and proposes a number of specific investments.

V.1. Thematic objectives and investment priorities

140. **Out of the eleven TOs defined by the EC, five fit best the specific development needs of the West Region**. Investments priorities to be identified in the next subsections can be financed from different ESI funds, including the ERDF. Whereas, investments promoted at national level, through other programs, can also be implemented, the current proposal focuses on investments that can be financed with regional initiatives.

Thematic Objective 1: Strengthening research, technological development and innovation

141. **The need to strengthen research, technological development and innovation is motivated by the low level of R&D expenditure in the West Region** - only 0.22% of regional GDP in 2010, down from 0.3% in 2008, compared to a national average of 0.47%. While there is a research base in the region, its connection with industry is limited. Major local universities have started to invest in technology transfer, but such investments are still at early stages. Further investments are needed to support business research and innovation, to develop linkages and synergies between enterprises, and to improve R&D infrastructure in the region.

142. **The automotive, textiles, ICT, and agro-food sectors, as well as other activities, have significant potential for growth and innovation.** Resource efficient materials can be pursued as an

additional specialization of the region, taking into account that energy saving is going to remain an EU-wide priority for the foreseeable future. The region's natural endowments would also suggest an effort to specialize in anti-age and medical tourism. This would require complementary investments in spa and wellness tourism, ecotourism and active tourism, which can be financed under the TO6. Development of new clusters for wood processing or green energy could be also explored as an option to shift the region's comparative advantage towards eco-innovation and similar activities.

143. **The West Region needs an efficient regional innovation system to increase the competitiveness of local companies**, in particular by improving their capacity to conduct research and development, which would allow them to shift the focus to higher value added activities. Moreover, attracting large companies into innovative clusters can lead to technology transfer upstream in the supply chain towards smaller local companies with the consequent diversification of the region's production base.

144. **Improvements in the institutional framework are needed to maximize the efficiency of investments in research, development and innovation,** through the creation and consolidation of specialized institutions, such as regional agencies for economic development or regional agencies for innovation, which could manage and expand the existing projects on innovative clusters.

Thematic Objective 3: Enhancing the competitiveness of small and medium-sized enterprises

145. **The role of SMEs is crucial to ensure economic development of the region**, especially in areas located far from the economic agglomerations. Analysis conducted as part of this project shows that a market structure which encompasses a few leading firms and a wide range of smaller firms appears to be more conducive to competition and has the potential to maximize output and employment growth.

146. **Small and medium sized enterprises in the West Region need support to become competitive**. Potential measures targeted at SMEs could aim to improve labor productivity and energy efficiency. In addition, authorities can help increase firm access to finance, one of the main obstacles for SME development in Romania and the West Region.

147. **Such solutions can include the creation of investments funds with joint support from EU funding.** Interventions designed under TO3 can also include measures targeted to agro-food firms and indirectly help to make better use of the local agricultural potential. Regional institutions for innovation, such as those proposed under TO 1, can enhance knowledge and technology diffusion to SMEs.

Thematic Objective 6: Protecting the environment and promoting resource efficiency

148. **The West Region has a significant touristic potential that needs to be further exploited and supported.** Areas for development include spa and wellness tourism, cultural tourism, ecotourism and active tourism, as well as urban and MICE tourism.

149. **The important cultural and archeological sites located in this part of the country need to be included in a common integrated thematic itinerary and adequately promoted**. Similarly, measures to develop the spa resorts located in the region can be designed along with research projects under TO 1 focused on thermal water treatments.

Thematic Objective 10: Investing in education, skills and lifetime learning

150. **Expanding the availability of highly skilled labor force that can engage in innovative activities is a major challenge for the region.** Timisoara, and to lesser extent Arad, are the only cities

where such capacity is available, yet even here it is limited. University graduates need to be better trained on how to apply theoretical knowledge. Firms often have difficulties finding graduates to meet their needs, partly because the skills provided by the educational system do not go beyond theoretical concepts.

151. **In order to develop appropriate skill sets for young graduates, linkages between industry and universities must be improved.** This can be attained through public-private partnerships on R&D collaborations or by adjusting the school curriculum to respond to industry needs. Currently such joint projects are only available to large companies like Siemens and Continental, which have programs and partnerships with local universities. These efforts must be scaled up and should encompass local firms, including small and medium size enterprises.

152. **Vocational training also needs to be significantly expanded and upgraded in order to supply a sufficient number of qualified technicians (specialized labor).** Lack of skilled workers who can operate mid and high-tech machines limits the growth potential of firms and increases the cost of production. Access to a larger pool of specialized labor force complemented with better guided young university graduates would strengthen the region's comparative advantages. While partnerships between private and education establishments, either for initial education or for long life learning programs can be promoted through ESF projects, investments in educational infrastructure should be sustained through ERDF measures. These partnerships can be envisaged as self- sustained projects, or as part of integrated projects for investments in research and innovation.

Thematic Objective 11: Enhancing institutional capacity and an efficient public administration

153. **Specialized institutions are required to ensure the success of smart specialization investments.** One or more administrative bodies are needed which can coordinate investment implementation and can oversee a rigorous process of monitoring and evaluation. Moreover, institutions such as technology transfer offices can support the smart specialization strategy by promoting private sector collaboration with universities and RDIs.

V.3. Optimum policy mix and possible budget requirements

154. **The five thematic objectives can be grouped in three priority axes** (see table below), encompassing the main needs for development identified in the region. In principle, according to European Commission guidelines, a priority axis represents one of the priorities of a strategy in a program comprising a group of operations, actions or projects which are related and have specific measurable goals.

Table 17- Priority axes and thematic objectives: an application for the West region

Priority axis (PA)	Thematic objective (TO)
PA1: Regional competitiveness enhancement and smart specialization	TO1. Strengthening research, technological development and innovation TO3. Enhancing the competitiveness of small and medium-sized enterprises TO11. Enhancing institutional capacity and an efficient public administration
PA2: Protect the natural and cultural assets of the region	TO 6. Protecting the environment and promoting resources efficiency
PA3: Education for all at high standards	TO 10. Investing in education, skills and lifelong learning

155. **Priority Axis 1: "Regional competitiveness enhancement and smart specialization in the West Region" aims at promoting the smart specialization potential of the region.** The proposed investment priorities envisage a mix of interventions aimed at (i) fostering the research and innovation potential of the sectors and actors with potential and interest in this regard, and (ii) increasing the capacity of SMEs to consolidate their position in the market, through innovative and sustainable investments.

156. **Priority Axis 2: "Protect nature and culture assets of the region**, while exploiting the heritage for the economic interest of the region. In this regard, investments priorities are designed to leverage the natural and cultural heritage of the region, including the historical urban centers and sites, and the specific tourism assets. By investing in this direction, the specificity of the region and its comparative advantages can be used to improve the level of development and the quality of life of the region's residents.

157. **Priority Axis 3: "Education for all at high standards" complements the other two priority axes.** Productive and "smart" investments can only be successful if complemented with adequate interventions to ensure an appropriate skills match. Besides soft measures, investments in educational infrastructure have to be continued in order to ensure equal access to education standards of a high standard.

158. **The specific objectives and selected investment priorities identified under these three priority axes are described in the following subsections.**

V.3.1. Priority Axis 1: Regional competitiveness enhancement and smart specialization in the West Region

159. **The *first investment priority* under this axis is to enhance the regional research and innovation infrastructure and to promote centers of competence.** The specific objectives of this investment priority are to: (i) increase the research and innovation capacity of the region aiming to create new products and technologies; and (ii) increase the cooperation between the local and regional actors responsible for research, technological development, innovation and business development, and strengthen the associative culture of the companies of the West Region.

160. **Research in the region can be strengthened through private-public partnerships structures.** Research in fields like ICT, electronics, wood processing, renewable energies, agro-food, can be expanded through new infrastructure developed either by public or private structures, acting alone or in association. For example, spa-focused medical research can conducted in the region, taking into account the potential of thermal resources. Similarly the development of a regional agro-food market can benefit from a new ICT product that could improve virtual trading.

Box 4 - Enhancing R&D through public-private partnerships: the case of CITES, Spain

Policy makers can utilize public-private partnerships (PPP) to evaluate private sector's demand for research and development facilities, by using PPPs to allow the government to invest in high-yield projects. In Spain, authorities have introduced regional Technology Centers (CITEs) which are co-financed by the public and private sector. CITEs focus on providing technology services in specific economic sectors. These institutional arrangements have become an important part of Spain's innovation policy. Technology centers support the commercialization of new research and help creative entrepreneurs to put their ideas into practice. The services offered by CITEs are tailored to the particular needs of the regions and include:

- facilitating knowledge-transfer and the adoption of existing technologies by enterprises;
- overcoming potential gaps in sectoral value chains and helping firms meet quality standards;
- identifying potential innovation opportunities in terms of products or processes in a variety of industries;
- facilitating the entry of new products on the market;
- providing value added services to enterprises and acting as incubators for start-offs
- training

Overall, these functions respond to the technological needs, as well as skill formation or adaptation, for the specific area of specialization in the region. More broadly, in this type of region, the key is to foster backward and forward linkages and product differentiation to move up in the value chain by exploiting existing scientific potential, fostering academic entrepreneurship, research commercialization and collaboration between public and private sectors.

161. **Major universities in the region have started to invest in technology transfer, but such investments, and need to be better exploited and enhanced to promote the smart specialization of the region.** A recent example of an initiative to facilitate the transfer of knowledge to industry is the joint e-Austria institute formed with the participation of the Computer Science Departments of the West and Politehnica Universities and the Research Institute for Symbolic Computation at the Johannes Kepler University in Linz. The institute has ongoing projects with private partners in Austria, Germany and Romania. Another example of the recent efforts to foster collaboration between universities and the private sector are the agriculture extension services provided by the Banat University of Agriculture and Veterinary Medicine (this project was initiated with a contribution from World Bank MAKIS project funding in 2008).

162. **Collaboration between companies in the West Region is limited and should be supported.** In this context, it is necessary to reinforce the associative instruments for businesses through the creation of meeting spaces, the articulation of networks of collaboration, and the promotion of associations. These measures can help generate the necessary confidence for cooperation and can improve the flow of information between the actors of the regional innovation system. The ultimate goal is to work directly with SMEs, so that support policies and initiatives to encourage innovation reach and benefit the private sector. Under this investment priority projects that promote meetings and encourage connections between enterprises will be prioritized, particularly collaborative projects between two or more SMEs.

163. **The *second investment priority* encompasses two goals: to promote business investment in innovation and research, and to develop links and synergies between enterprises, research and innovation centers, and higher education for the development of products and services, technology transfer, and networking.** The specific objectives of this investment priority are to: (i) Promote the transfer of knowledge and innovation in regional economy; and (ii) Improve access of enterprises to support services and foster enterprise development.

164. **The technology parks already active in the region would benefit from investments in upgrading.** This would support the development of the existing research potential and promote technology transfer towards private businesses in the region. The partnerships between universities, research institutes and private enterprises, especially the large ones, which have substantial growth potential based on the smart specialization of the region, are to be promoted in order to develop investments in research and innovation that could generate products and services with high added value. The most relevant sectors in the West Region economy are automotive, ICT, textile, agro-food, as well as existing clusters, which have the potential to be further developed. Innovative ICT products can be envisaged especially if new business structures are to be developed.

165. **During the next financing period measures can be implemented to help companies incorporate advanced services and technology into the production process**, thereby increasing the competitiveness of the private sector. Given the limited use of crosscutting technologies such as the ICT, design, or eco-innovation, by regional SMEs , companies in the tourism and agro-food sectors, as well as automotive suppliers, and the construction and textile sectors will be the "beneficiaries" of ICT applications, design and the eco-innovation programs and services. Priority will be given to projects that involve collaboration between businesses and industries. Measures and projects supported under this investment priority can include: support for the incorporation of ICT in the tourism, textile and agro-food industries; incorporation of enhanced design capabilities and eco-innovation by SMEs (such as automotive suppliers, construction, textiles and agro-food firms) in order to increase value added; introduction of digital Marketing and Web 2.0; and development of low cost software management systems of for small

166. **The *third investment priority* under the current priority axis is to support SME growth and help companies increase innovation capacity.** The specific objectives of this investment priority are to: (i) contribute to the EU 2020 strategy by increasing the level of employment; (ii) support access to international markets; and (iii) promote the diversification of activities with modern technologies

167. **Measures financed under this priority investment will aim to support SMEs to develop their capacity for technology adoption and innovation.** These financing instruments should be oriented particularly towards SMEs in sectors with latent or unclear comparative advantage, such as agro-food, tourism or construction, in order to improve their competitiveness on internal and external markets, and to help them diversify their activities. An example of action that can be financed under this priority investment is the creation of an agro-food stock-exchange center. By expanding the access of small farmers to the market, this project could lead to an increase in the availability of agricultural products and raw materials.

168. **The *fourth investment priority* is to enhance the growth potential of the rural areas by investing in the agro-food sector.** The specific objectives of this investment priority are to: (i) improve the competitiveness of the agricultural sector; and (ii) increase income levels in rural areas. The share of the region’s land area that is utilized for agriculture is the lowest among all regions in Romania. However, the West Region encompasses fertile lands that can support a diverse set of agricultural activities (including cereal, horticulture and animal production) and which could be better exploited through targeted measures and through a more efficient market organization. These measures should

aim to enhance the sustainability of local farms and to raise competitiveness levels for all types of agricultural production. This could be achieved through: (i) restructuring of farms, in particular through on-farm investments, financing for processing, marketing and development of agricultural products and investments in support infrastructure; and (ii) facilitating generational renewal through business start-up aid for young farmers[50].

169. **Measures under this investment priority should also promote food chain organization and risk management in agriculture** by: (i) better integrating primary producers into the food chain through support for quality schemes, promotion in local markets, horizontal and vertical cooperation, new marketing and networking opportunities, the development of short supply chains, and the setting up of producer groups; and (ii) assisting farmers with risk management and financing investments in preventive and restoration actions.

170. **The *fifth investment priority* aims to support the development of innovative finance capacity.** The specific objectives of this investment priority are to: (i) create new financial mechanisms to accelerate economic development; and (ii) create a regional development fund.

Box 5 - Support for regional SMEs in Georgia

The Small Enterprise Assistance Fund (SEAF) launched in 2006 the Georgia Regional Development Fund, a financing mechanisms which focuses on investments in SMEs located outside the country's capital, Tbilisi, and those operating in the agro-food sector. The Fund's 30 million USD portfolio comprises investments in fishing, fruit concentrate production, ecotourism hotels, and furniture.

In order to prepare regional SMEs in Georgia to compete on international markets the Fund Manager can provide business technical support including: marketing and strategy (develop marketing plans, support marketing teams); global networking (introduce global business networks, support export and import strategies); operations assistance (cooperatively identify areas for improvement, facilitate visits by outside experts); additional financing (identify new sources of financing, leverage relationships with local banks, provide negotiation and contracting support); financial control (business planning and budgeting, accounting and management information systems, facilitate hiring and training of CFO); corporate governance (design of effective incentive structures, board of directors oversight, legal structure).

171. **As one of the main problems for investments at SMEs level represents the lack of adequate financing opportunities, the introduction of a regional development fund, partially financed through the European Regional Development Fund (ERFD), could provide a sustainable solution.** This fund could act as a manager for investments in SMEs located in the West Region, and can administrate combined interventions of reimbursable funds and grants for productive and innovative investments, under the umbrella of the Regional Operational Programme. This type of instrument can increase the availability of financing through a multiplying effect at the level of the regional economy.

172. **The *sixth investment priority* is to develop an institutional framework to support innovation in West Region.** The specific objective of this investment priority is to ensure the management of smart specialization investments.

173. **Establishing an innovation center at the regional level which can play a key role in the promotion of the local innovative potential.** A proper implementation of smart specialization investments requires an administrative entity that can coordinate, monitor and evaluate investment progress, in order to identify potential bottlenecks and find appropriate solutions. In this context, the goal of an institutional framework to support innovation in West Region is to ensure the effective and

[50] This investment priority could be financed through ERDF and/or EARDF

efficient commissioning and implementation of smart specialization investments, and to maintain dialog and coordination with regional actors and with national authorities.

174. **In this context, an innovation center for the West Region could act as an agency on behalf of regional authorities and can be responsible for implementing a strategy for smart specialization and for ensuring its consistency.** Specifically, it could oversee the commissioning, continuity and expansion of smart specialization investments, as well as their coordination and synchronization with other instruments or policies. It could maintain and strengthen the consensus between regional actors regarding the necessary measures to support innovation in the region. It could also develop tools to gather regional intelligence in order to help informed decision-making. Other types of agencies or offices can be established, especially in light of the regionalization process and in relation to the promotion of the other competitiveness goals of the region, such as increasing exports and internationalization. In addition, such as center would have the capability to launch fast-moving programs that would allow researchers to work directly with businesses while conducting research and to apply innovative solutions for technologies, products, marketing, management and information systems.

V.3.2. Priority Axis 2: Protect the natural and cultural assets of the region

175. **The *first selected investment priority* under this priority axis is to protect, promote and develop the regional cultural and natural heritage.** The specific objectives of this investment priority are: (i) the restoration and sustainable use of the cultural heritage and the modernization or introduction of supporting infrastructure; and (ii) the creation, development, and modernization of the tourism infrastructure in order to increase the quality of tourism services and to support the sustainable use of natural resources. .

176. **Targeted measures are needed in order to preserve and enhance the touristic assets of the region.** The West Region has been endowed with a wide range of natural, cultural and historical assets, including mountainous regions and thermal waters as well as important historical sites and monuments. Targeted measures need to be implemented in order to preserve these assets and give them a real economic value by integrating them into attractive tourism circuits. The local administration can identify and promote projects to rehabilitate the historical sites and to modernize medical facilities in spa resorts. This type of projects can be promoted in areas such as Buzias and Baile Calacea in Timis county; Moneasa and Lipova Bai in Arad county; Baile Herculane in Caras-Severin county; and Geoagiu Bai and Baile Calan in Hunedoara County. Moreover, the potential for urban and business tourism can be further explored by the local authorities by identifying major urban agglomerations that can host large conferences and events, such as Timișoara-Arad, Deva-Hunedoara and Reșița-Caransebeș or Lugoj-Caransebeș.

177. **The second investment priority is to protect and restore soil and biodiversity and to promote ecosystem services** including NATURA 2000[51] and green infrastructure. The specific objective of this investment priority is to protect and promote the bio diversity of the national parks of the West region. This strategy can comprise two main actions: (i) including the protected natural areas for which management plans have not been developed on the list of future projects to be financed; and (ii) identifying the management plans already developed, in order to ensure the implementation of the

[51] Natura 2000 is the centerpiece of EU nature & biodiversity policy. It is an EUwide network of nature protection areas established under the 1992 Habitats Directive. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats.
(http://ec.europa.eu/environment/nature/natura2000/)

measures specified by these existing plans. Management plans are essential in order allow land or forest owners to benefit from compensatory measures, an issue which has been problematic especially for forestry. For this reason the local authorities should be involved in identifying, promoting and implementing well-designed strategies for the protected natural areas.

V.3.5. Priority Axis 3: Education for all at high standards

178. **The *first investment priority* under this priority axis is to improve the skills and competences of the labor force in order to best meet market needs.** The specific objectives of this investment priority are: (i) increasing the share of population with tertiary education; and (ii) encouraging the access to professional development, including lifelong learning programs.

179. **The analysis of the regional level economy revealed a mismatch between the available skills and the needs of the labor market in the West Region. This problem can be addressed through training programs developed under the national operational program.** Projects can be designed with the support of the regional authorities that can ensure coordination between the demand side and the training providers (schools, universities or vocational training centers) in order to identify and promote those projects that fit with the needs of the local economic actors.

180. **The limited number of vocational schools in the region (and in the country) has had a negative impact on the ability of firms to increase productivity and to expand. This issue affects all the sectors in the region and is one of the most important bottlenecks that have to be addressed through future investments.** In this respect, adapting theoretical education and vocational training to the demands of the labor market, increasing the relevance of the educational and vocational training offer by anticipating private sector requirements, and ensuring the applicability of the learning material, are key role for the economic development of the region. These goals can be ensured by: i) developing on-the-job training through apprenticeship schemes, internships, and scholarship programs that aim to develop specific competences and skills by providing on-the-job training; and, ii) strengthening the capacity of vocational training providers to deliver attractive and high-quality education and training programs in correlation with labour market demands, especially for sectors with significant growth potential, in order to ensure complementarity with the competitiveness strategy. Other type of measures that can be financed in order to develop entrepreneurial and business management skills training are: i) promoting partnerships and networks for companies and training providers, so as to increase the applicability of training in the market; ii) supporting lifelong learning through the development and implementation of measures to enhance the relevance of higher education programs, including through an increased focus on problem solving, creativity and development of entrepreneurial skills; iii) developing and strengthening the partnerships between higher education institutions, business environment and research institutes.

181. **The *second investment priority* under this priority axis is to invest in education, skills and life-long learning by developing education and training infrastructure.** The specific objective of this investment priority is the rehabilitation, modernization, development and expansion of pre–university, university education and continuous vocational training infrastructure.

182. **Soft Measures such as educational and vocational training programs have to be properly sustained by the educational infrastructure and proper endowment of schools and vocational training centers** to ensure a high-quality teaching process, using appropriate pedagogical and technical resources. Investments that have started under the current period should continue in order to build an appropriate educational infrastructure endowment at the level of the region.

183. **In addition to the investments priorities under the overall priority axes described above, local road and transport infrastructure has emerged as a key issue for the competitiveness of**

the private sector in the region. **However, presenting detailed measures for infrastructure enhancement is outside the scope of this assessment.** Analysis conducted as part of this project ("Economic Geography Assessment: Territorial Development Challenges in the West Region" (2013) provide evidence that improving internal connectivity with the region's main urban agglomerations, particularly with the Timișoara-Arad conurbation, is critical for addressing territorial disparities in the West Region. Consultations with local firms have reinforced these findings. The chapter does not provide detailed measures for infrastructure enhancement due to the fact that infrastructure investment priorities are eligible for EU co-financing in the 2014-2020 period *only* if linked to a national transport master plan, which is beyond the span of this study.

184. **It is important to stress, however, that a future regional development program should identify a list of priorities for the improvement of regional transport infrastructure**[52]**,** including key secondary and tertiary connectivity projects. Project prioritization should take into account the economic role and importance of urban or rural centers that need to be linked to the main cities in the region and to the TEN-T Network, and which can be financed through national programs, as well as the degree of dependence of the rural economy on increased connectivity to larger urban centers. The selection of the main national and county roads that need to be connected through secondary and tertiary nodes to the TEN-T network should be correlated with the traffic analysis and the conclusions of the General Master Plan for Transport, developed at national level.

V.4. Detailed strategy overview for the region

185. **The successful implementation of the proposed interventions relies on the coordination between national and local authorities, with regard to all of the five thematic objectives that best fit the specific development needs of the West Region.** In order to support the goal of smart specialization, both the national and regional structures should concentrate their efforts on the first two thematic objectives defined by the EU Cohesion Policy: Thematic Objective 1 "Strengthening research, technological development and innovation" and Thematic Objective 2 "Enhancing the competitiveness of small and medium-sized enterprises (as defined by EC)". At national level, investment priorities could concentrate on supporting (i) the national institutes for research and development, structures under the coordination of the Romanian Ministry of Education, as foreseen in the Decision of the Government 185 from April 2013, and (ii) the research, development and innovation, within the large enterprises. At regional level, the investment priorities could concentrate on regional competitiveness enhancement and smart specialization and need to envisage a mix of interventions aimed at (i) fostering the research and innovation potential of the sectors and actors with potential and interest in this regard, and (ii) increasing the capacity of SMEs to consolidate their position in the market, through innovative and sustainable investments. The projects to be financed under these two thematic objectives have to be in line with the national research and innovation strategy for smart specialization, which is an integral part of a new industrial policy, which is under preparation by the Romania Government. This type of interventions can support the valorization of national fields of excellence and comparative advantages, and reflect demand-driven inputs. The projects to be financed under Thematic Objective 11 "Enhancing institutional capacity and an efficient public administration", have to be in line with the national strategy for reinforcing Romania's administrative efficiency, including the program for public administration reform, which is under preparation by the Ministry of Regional Development and Public Administration. This thematic objective will be financed from the European Social Fund (ESF), most probably within a separate operational programme for increasing the administrative capacity of the country. Regional

[52] Regional Development Agencies will identify, as part of the Regional Development Plans, a list of priority projects on transport infrastructure.

structures could present their own projects and manage their implementation. The Thematic Objective 6 “Protecting the environment and promoting resources efficiency”, which can be financed from ERDF and CF, supports both national and regional investment priorities. At national level, the priorities could focus on supporting water and waste sectors (financed from CF), while at regional level, the investment priorities could concentrate on investments financed from ERDF, such as protecting, promoting and developing cultural and national heritage as well as the preservation of biodiversity through the proper implementation of management plans. Thematic Objective 10 “Investing in education, skills and lifetime learning”, which can be financed from ERDF and ESF, supports both the national and regional investment priorities. At national level, these investment priorities could concentrate on type of actions which can be supported by the ESF, and at regional level on ERDF type of interventions, such as upgrading and modernizing education infrastructure. The support for education infrastructure should be sustained by a national strategy and by planning provision needs at local level. This approach should be based on a mapping of the existing structures and their level adequacy, taking into consideration projected demographic trends in school population.

186. **The detailed program overview, including specific objectives for each investment priority are presented below,** along with the potential financing sources which can include national, local, and EU financing .

Table 18: Overview of the investment strategy and main funding sources

Priority axis	Thematic objective	Investment priorities	Specific objectives corresponding to the investment priorities	Financing resources / programme
1. Regional competitiveness enhancement and smart specialization	TO1. Strengthening research, technological development and innovation	1.1. Enhancing R&I regional infrastructure and capacities to develop R&I and promoting centers of competence	Contribute to EU 2020 strategy by increasing the investments in research and development Increase the research and innovation capacity of the region aiming to create new products and technologies Increase the cooperation between the local and regional actors responsible for research, technological development, innovation and business development	National, local and EU financing West Regional Operational Programme
		1.2. Promoting business investment in innovation and research and developing links and synergies between enterprises, R&I centers and higher education in particular products and service development, technology transfer and networking	Contribute to EU 2020 strategy by increasing the investments in research and development Promote the transfer of knowledge and innovation in regional economy Improving access to support services for SMEs, to foster their development	National, local and EU funds, West Regional OP
	TO3. Enhancing the competitiveness of small and medium-sized enterprises	1.3. Supporting the capacity of SMEs to engage in growth and innovation process	Contribute to EU 2020 strategy by increasing the investments in research and development Contribute to EU 2020 strategy by increasing the level of employment Supporting access to international markets Promoting the diversification of activities with modern technologies	National, local and EU financing West Regional OP
		1.4. Enhancing growth potential of the rural areas through investing in agro-food sector	Improve the competitiveness of agriculture sector Increase the wealth in rural areas	National, local and EU financing
		1.5. Supporting the development	Create new financial mechanisms	National, local

Priority axis	Thematic objective	Investment priorities	Specific objectives corresponding to the investment priorities	Financing resources / programme
		of innovative finance capacity for regional development	supporting economic development Create the Regional Development Fund	and EU funds, West Regional Operational Programme
	TO11. Enhancing institutional capacity and an efficient public administration.	1.6. Developing institutional framework supporting innovation in West Region	Ensure the management of smart specialization investments	National, local and EU funds from West Regional Operational Programme or Technical Assistance Operational Programme
2. Protect the nature and , culture assets of the region	TO 6. Protecting the environment and promoting resources efficiency	2.1. Protecting, promoting and developing cultural and national heritage	Restoration and sustainable valorization of cultural heritage and setting up/ modernization of related infrastructure Creation, development, modernization of the tourism infrastructure for sustainable valorization of natural resources and for increasing the quality of tourism services	National, local and EU funds, West Regional Operational Programme
		2.2. 2.2 Protecting and restoring biodiversity, soil protection and restoration and promoting ecosystem services including NATURA 2000 and green infrastructure	Promote the bio-diversity of the National Parks of West region	National, local and EU funds, West Regional Operational Programme

Priority axis	Thematic objective	Investment priorities	Specific objectives corresponding to the investment priorities	Financing resources / programme
3. **Education for all at high standards**	TO 10. Investing in education, skills and lifetime learning	3..1. Improving skills and competences required in labor market	Increasing the share of population with tertiary education Encouraging the access to professional development, including lifelong learning programs	National, local, and EU financing
		3..2. Investing in education, skills and long life learning by developing education and training infrastructure	Rehabilitation, modernization, development and equipping of pre–university, university education and continuous vocational training infrastructure	National, local and EU funds, West Regional Operational Programme

187. **The operationalization of the measures highlighted above encompasses, in some extent, the implementation of investment projects.** The table below lists 14 examples of competitiveness and smart specialization investment pilot initiatives that could be developed and implemented starting with 2014. ***These investment projects have not been appraised nor endorsed by the World Bank*.** This list should be considered as merely illustrative. Additional details regarding these potential pilot initiatives are provided in Annex 2.

Table 19 -Examples of investment pilot initiatives

1. Innovation center for the West Region which could play a key role in the promotion of the innovative potential of the region
2. A ICT competitiveness pole
3. A regional development fund focused on financing innovative projects in the West Region
4. Upgrade of the existing industrial parks and industrial areas to regional industrial and technology parks
5. Regional exhibition and training center
6. Laboratory and innovation center for the auto industry
7. Laboratory and innovation center for the textile industry
8. Laboratory and innovation center for wood processing industry
9. Agro-food market center including a regional accredited laboratory for food safety and veterinary tests
10. Launch of feasibility study to assess the regional priorities for land irrigation
11. Innovation center for green energies and energy efficiency
12. Center for protection and promotion of natural parks
13. Geo therapy center
14. Pilot initiative on development solutions for the mining areas

188. **Against this background, increasing overall R&D expenditure to reach the target of 2% of regional GDP[53] is a highly ambitious goal for the West Region and progress towards the target should be continuously monitored.** Therefore, it is important to establish quantifiable objectives as part of the policy design, as well as a monitoring and evaluation framework that allows for regular assessment of progress. In this context, Table 20 below outlines the manner in which the overall proposed actions respond to each investment priority, along with the best modalities to finance projects under each investment priority, and suggests types a set of general results indicators.

[53] Established at the national level as part of the EU 2020 Strategy.

Table 20- Actions to be supported under the investment priority

Investment priorities	Proposed pilot initiatives	Guidelines for selection of operations/ Financial instruments	Results indicator
1.1. Enhancing R&I regional infrastructure and capacities to develop R&I and promoting centers of competence	Regional innovation center pilot initiative on development solutions for the mining areas An innovation center for green energies and energy efficiency Regional center for wood processing	List of preselected projects identified in the Regional Development Plan	Number of R&D personnel working in the newly built or equipped research infrastructure
1,2. Promoting business investment in innovation and research and developing links and synergies between enterprises, R&I centers and higher education in particular products and service development, technology transfer and networking	Enhancement of the local technology parks Support for ICT projects in the West Region An innovation and competitiveness center for the auto industry	List of preselected projects identified in the Regional Development Plan	Number of enterprises that introduced new or significantly improved products, new to the market as a result of supported innovation of R&D projects
1.3 Supporting the capacity of SMEs to engage in growth and innovation process	An agro-food market center and a regional accredited laboratory for food safety and veterinary tests A regional innovation center for the textile industry	List of preselected projects identified in the Regional Development Plan	No of jobs created No of SMEs assisted
1.4 Enhancing growth potential of the rural areas through investing in agro-food sector	Restructuring of farms, in particular through on-farm investments, investments related to the processing, marketing and development of agricultural products or investments in infrastructure for the development and adaptation of agriculture; Better integrating primary producers into the food chain through support for quality schemes, promotion in local markets, horizontal and vertical cooperation, new marketing and networking opportunities, the development of short supply chains and the setting up of producer groups;	Call for projects	Number of farms supported Number of SMEs in rural areas created/developed

Investment priorities	Proposed pilot initiatives	Guidelines for selection of operations/ Financial instruments	Results indicator
1.5. Supporting the development of innovative finance capacity for regional development		Financial scheme and mechanism Call for projects	Number of jobs created No of SMEs assisted
1.6. Developing institutional framework to support innovation in West Region	Setting-up an institution responsible for managing smart specialization investments		Number of institutions created No of institutions supported
2.1.Protecting, promoting and developing cultural and national heritage	Improvement of natural sites with tourism potential Valorization of touristic potential in mountainous areas by construction of the necessary infrastructure: Rehabilitation and arrangement of access ways to the main tourist natural objectives, alpine refuges, signposting hiking paths, informative board, camping platforms, mountain rescue posts Development of spa tourism - improvement, modernization and endowment of treatment facilities, including therapeutic salinas, development of captivation and/or transport networks for mineral and saline springs etc. Creation, rehabilitation, and extension leisure tourist infrastructure and related utilities A regional multi exhibition and training center regional pilot project for a geo therapy center aiming to use the local natural resources in order to create anti-aging and medical tourism programs integrated in a new regional network of clinics and spas	List of preselected projects identified in the Regional Development Plan – for more than 5 mil Euro Call for projects for a budget under 5 mil Euro	Number of visits at supported sites
3.1 Investing in education, skills and lifetime learning by developing education and training infrastructure	Rehabilitation, modernization, development, and equipping of pre–university, university education and vocational training infrastructure	List of preselected projects identified in the Regional Development Plan	Service capacity of supported education infrastructure

Investment priorities	Proposed pilot initiatives	Guidelines for selection of operations/ Financial instruments	Results indicator
	Development of technical education to ensure a better link between training and industry		

189. **The implementation of the overall initiatives outlined in this chapter depends on the existence of an efficient institutional framework.** The smart specialization goal can only be accomplished through coordination among local, regional, and national authorities on policy design and implementation, and in close cooperation with the private sector and research bodies. Taking into consideration the current institutional setup at the regional level (see Box 3), Chapter 4 has suggested the establishment of two regional committees, managed by the RDA, that could support the partnership between national and regional policy makers. This proposal can optimize policy coordination provided that it is accompanied by the streamlining of existing cooperation mechanisms. As outlined in Table 21, the improvement of the existing institutional framework is a pre-requisite for the successful implementation of a regional strategy. All the other measures can be implemented concurrently over the 2014-2020 programming period.

Table 21- Overall outline and time frame for the development of smart specialization strategy in the West region

Key actions	Investment priorities	Time frame
I. Improve the institutional framework supporting innovation		Create the institutional framework for smart specialization ate regional level - by the end of 2013- by decision of the Government.
II. Priority Axis 1:	1.1. Enhancing R&I regional infrastructure and capacities to develop R&I and promoting centers of competence	Launch the call for projects by end of 2014. First tranche of contracts concluded by June 2015
	1.2. Promoting business investment in innovation and research and developing links and synergies between enterprises, R&I centers and higher education in particular products and service development, technology transfer and networking	Launch the call for projects by end of 2014. First tranche of contracts concluded by June 2015
	1.3. Supporting the capacity of SMEs to engage in growth and innovation process	Launch the call for projects by end of 2014. First tranche of contracts concluded by June 2015
	1.4. Enhancing growth potential of the rural areas through investing in agro-food sector	Launch the call for projects by end of 2014. First tranche of contracts concluded by June 2015
	1.5. Supporting the development of innovative finance capacity for regional development	Design the investment fund project by mid of 2014 using TA funds from the current programme Set-up the investment fund- end of 2014.

III. Priority Axis 2	2.1 Protecting, promoting and developing cultural and national heritage	Launch the call for projects by end of 2014. Support to the potential beneficiaries for project preparation. First tranche of contracts concluded by June 2015
	2.2 Protecting and restoring biodiversity, soil protection and restoration and promoting ecosystem services including NATURA 2000 and green infrastructure	
IV. Priority Axis 3	3.1 Improving skills and competences required in labor market	Correlate the investment priority with the Human Resources Programme financed under European Social Fund and with the list of public projects as defined at point 3.2.
	3.2 Investing in education, skills and long life learning by developing education and training infrastructure	Define the list of public projects according to the national policy by the end of 2013.

VI. Conclusion

190. **In 2010, the Europe 2020 Strategy was launched as the European Union's ten-year growth strategy which is built on three main objectives: "smart growth", "sustainable growth" and "inclusive growth.** These objectives aim to tackle both the structural weaknesses in Europe's economy exposed by the crisis, as well as the long term challenges, while reducing regional disparities in terms of income, wealth and opportunities.

191. **In this context, although the Western part of Romania has a per capita GDP that is higher than the national average, there is still considerable catch up to be done before reaching EU levels.** The West Region benefits from a number of competitive strengths, which it can use to build a strong and sustainable path to economic development. The Western part of the country is endowed with reasonably plentiful physical endowments, which are unexploited to some extent. In addition, the region is considered to have a relatively highly skilled population due in part to the prominence of its universities. The local universities are especially strong in natural sciences, mathematics, computer science, food engineering, agriculture, as well as medical and veterinary sciences. Due in part to these advantages, the region has experienced rapid economic growth which has delivered rising real wages, supported by commensurate improvements in productivity. Moreover, there are important signs of entrepreneurial activity and the West Region is one of the most firm and trade dense areas of Romania. Not surprisingly, it is also the second most export oriented and the third most import oriented in the country.

192. **Despite the good economic performance of the past decade, the region needs to overcome a series of challenges in order to shift its focus to higher value added activities and to accelerate the convergence process.** Several challenges can be highlighted. First, the fruits of economic development have not been distributed evenly across the West Region. Second, there are significant intra-regional disparities in terms of wages, productivity and exports. Third, economic activity in the region is concentrated in a handful of sectors that represent about half of the region's turnover and employment, which may lead to high volatility of value added growth and sharp drop of per capita GDP during a crisis. Fourth, the export-driven growth model of the region is potentially very vulnerable to exogenous developments.

193. **Against this backdrop, the set-up of smart specialization policies emerges as a key element to promote economic development**. These policies should follow a knowledge-driven approach to growth that: builds on existing comparative advantages; helps develop new activities in places where a strong comparative advantage might arise; and promotes a larger contribution of the knowledge factor to economic growth.

194. **The identification of the region's comparative advantage assumes a key role in the design of a strategy for smart specialization. Six sector-clusters (automotive, textiles, agro-food, ICT, construction, and tourism) were selected for in-depth analysis**, not because they are seen as "winning" activities per se, but because of their relevance and potential in the West Region's economy. This assessment has revealed, based on available information, that the region has apparent comparative advantage in focusing on automotive, textiles and ICT, while agro-food and tourism were classified as sectors with latent comparative advantage. The construction sector was classified as a sector with unclear comparative advantage.

195. **Each one of these sectors has its own constraints and specificities which define the overall challenges that will shape the future progress towards smart specialization of the region**. For the automotive sector as a whole, the overarching challenge is to diversify towards higher value activities, which requires moving up a very hierarchical structure under the international value chain.

For the textile sector, the challenge is also to increase value added by building the skills and capacities for firms to start producing their own design or brand. For the agro-food sector, given the complex – and increasingly global – features of the agro food value chain where the largest share of innovation (and value added) is generated by buyers, improving the marketing of the local products and establishing linkages with large distribution chains seems to the main challenge in the short term. For the ICT sector, which is generally regarded as an internationally competitive player in the areas of software development activities as well as design and engineering, the biggest challenge is to expand this entire set of activities. For the construction sector, the challenge is to expand the use of energy efficient materials and technologies, which, although encouraged by the European Union, is not yet widespread in the region. For the tourism sector, increased attention at the political level is key if the West Region is to take full advantage of its natural and cultural endowments.

196. **In order to tackle these challenges, broad areas for policy action have been identified; some of them are horizontal (common to all sectors) while other are sector specific**. Horizontal policy areas include: improving the link between tertiary education and the workforce and lifelong learning; improve the vocational school system for industry-relevant training; support entrepreneurial and business management skills; improving internal connectivity with the region's main urban agglomerations, particularly with the Timișoara-Arad conurbation, as well as the infrastructure to facilitate connectivity between Timisoara-Arad and more peripheral parts of the region; increasing the supply of non-reinbursable funds; improving the institutional framework supporting innovation. Sector specific policy areas encompass multiple issues. For the automotive sector: establishing local research institutes and labs to support firms in preparing prototypes, and testing new designs, products and processes; introducing vocational school providing relevant training for the auto industry, endowed with appropriate technical facilities; increasing awareness regarding the activities of the auto cluster initiatives in the region. For the textile sector: provision of tax incentives, subsidies and better financing terms on productive investments, especially on acquisition of new technology and machinery as a way to support the development of new design or products; and establishment/improvement of vocational programs focused on textile–relevant training with appropriate technical facilities. For the agro-food sector: supporting innovation in the industry, especially as food engineering, agriculture, and veterinary sciences are areas of strength of the West Region universities; and establishment/improvement of vocational school focused on agro–food industry– relevant training with appropriate technical facilities. For the ICT sector: expansion of services offered by incubators and business accelerators; support for mentorship programs; support for the connection between angel investors and potential entrepreneurs (public action to research the market and connect investors to new creative companies in need of funding); and support for the development of links with global customers and with downstream user sectors. For the construction sector: supporting the development of energy efficient materials using local inputs and expertise; increasing awareness regarding local energy efficiency projects; and combining measures that promote firm entry and encourage startups (potential high growth firms) – and allowing firm exit. In the tourism sector: developing anti-aging treatment packages; developing integrated tourism packages; using of national resources and regional brand products; supporting eco-tourism and active tourism; and developing appropriate awareness campaigns.

197. **Against the background of these broad policy areas and building on the region's comparative advantages, this report takes a practical approach and presents key elements for a smart specialization strategic policy framework for the West region.** It follows the general guidleines for the design of the instruments to be financed in the 2014-2020 programming period from EU structural funds and other sources.

198. **The design of the policy recommendations presented here follows the guidelines of the European Commission. First, specific thematic objectives, as defined by the Cohesion Policy of the European Commission, were identified.** These are: (1) Strengthening research, technological development and innovation; (3) Enhancing the competitiveness of small and medium-sized enterprises; (6) Protecting the environment and promoting resources efficiency (10) Investing in education, skills and lifetime learning; and (11) Enhancing institutional capacity and an efficient public administration.

199. **Second, after grouping the selected thematic objectives under priority axis, specific investment priorities were identified**. In order to help meet the goals of the EU 2020 strategy, these investment priorities aim to: increase financing in research, development and innovation process in the West Region (priority Axis 1); increase energy efficiency and the use of the renewable energy in the West Region (priority Axis 2and increasing the level of employment and education, by improving skills and competences required in labor market (priority Axis 5).

200. **Third, a number of 14 large integrated competitiveness and smart specialization regional pilot initiatives are presented as an illustration of how to enhance local growth potential based on the assets and characteristic specific to the West Region.** The regional integrated pilot initiatives refer to: an ICT competitiveness pole; a regional development fund focused on financing innovative projects in the West Region; upgrade of the existing industrial parks and industrial areas to regional industrial and technology parks; a regional exhibition and training center; laboratory and innovation center for the auto industry; laboratory and innovation center for the textile industry; laboratory and innovation center for wood processing industry; an agro-food market center including a regional accredited laboratory for food safety and veterinary tests; launch of feasibility study to assess the regional priorities for land irrigation; an innovation center for green energies and energy efficiency; center for protection and promotion of natural parks; a geo therapy center; a pilot initiative on development solutions for the mining areas. *These investment projects have not been appraised nor endorsed by the World Bank.* This list should be considered as merely illustrative.

201. **The implementation of the overall initiatives outlined in the report depends on the existence of an efficient institutional framework.** An effective institutional framework is key to enhance the innovation capacity, promote the local innovative potential, and increase the competitiveness of the private sector at the region**.** These goals can only be accomplished through coordination among local, regional, and national authorities on policy design and implementation, and in close cooperation with the private sector and research bodies. This report suggests the establishment of two regional committees, managed by the RDA, that could support the partnership between national and local policy makers. This proposal can optimize policy coordination provided that it is accompanied by the streamlining of existing cooperation mechanisms.

202. **Overall, the suggested policies and recommendations presented here aim to tackle the main challenges that prevent the West Region from catching up with its more developed peers over the next programming period (2014-2020).** The region has a dynamic economy, and stands out among the other regions of Romania as result of a high level of economic development, solid export growth rate, relatively skilled human resources, a large diversity of natural resources, and a favorable geographical location. In the 2014-2020 period, the West Region has the opportunity period to use its specific human, natural, and financial resources to ensure a consistent and sustainable development path and a gradual convergence with Bucharest and the highly developed regions of Europe. It has to exploit to the maximum assets and the available financing and seek synergies between the EU Funds and other financial sources in a strategic and integrated approach in order to face the tremendous development challenges and reach the strategic EU 2020 targets.

Annex 1 –Definition of Sector Clusters

Among all NACE activities covered by the SBS dataset, some specific sector clusters deserve particular attention: ICT, automotive; agro-food; textiles and leather; tourism; construction; energy; and health. The following tables display the precise NACE 2 description of each one of them, following consultation with the ADR-Vest. It is worth acknowledging that since information on NACE 2 sector is available only for the 2008-2010 period, all cluster analysis is restricted to this time period.

Table A1.4. ICT cluster: NACE 2 sector list

Sector	NACE CODES		Comments
ICT		261	all (Eurostat definition)
		262	all (Eurostat definition)
		263	all (Eurostat definition)
		264	all (Eurostat definition)
		268	all (Eurostat definition)
		474	all (our definition)
		582	all (Eurostat definition)
		611	all (our definition)
		612	all (our definition)
		62	all (Eurostat definition)
		63	all (Eurostat definition)
		582	all (Eurostat definition)
		951	all (Eurostat definition)

Table A1.6. Agro-food cluster: NACE 2 sector list

Sector	NACE CODES	Comments
Agro food	011-016	all (agriculture)
	03	all (fishing&acvaculture)
	10	all (food processing)
	11	all (beverage)

Table A1.7. Textiles and leather cluster: NACE 2 sector list

Sector	NACE CODES	Comments
Textiles&leather	13	Manufacture of textiles (all without 1392)
	14	Manufacture of wearing apparel
	15	Manufacture of leather and related products

Table A1.5.Automotive cluster: NACE 2 sector list

Sector	NACE CODES	Comments
Automotive	1392	textile article but no clothes (optional choice)
	2219	fabrication rubber products
	2222	fabrication plastic products
	2229	fabrication plastic products
	2433	steel processing
	2511	metal processing
	2550	metal processing
	2572	metal processing
	2573	metal processing
	2593	metal processing
	2732	wires production
	2740	electric lightning equipment
	2790	electric equipment
	2822	equipments
	2841	tools making
	2849	equipments&tools making
	2892	equipments&tools making
	2899	equipments&tools making
	29	all (car manufacture)
	3299	industrial activities

Table A1.8. Tourism cluster: NACE 2 sector list

Sector	NACE CODES	Comments
Tourism	55	all (country definition)
	56	all (country definition)
	79	all (services regarding tour-operators&booking)
	932	all (services regarding entertainment)

Table A1.9. Construction cluster: NACE 2 sector list

Sector	NACE CODES	Comments
Construction	41	all (country definition)
	42	all (country definition)
	43	all (country definition)

Annex 2 –Decription of regional investment pilot initiatives

The table below lists 14 examples of competitiveness and smart specialization investment pilot initiatives that could be developed and implemented starting with 2014. These investment projects have not been appraised nor endorsed by the World Bank. This list should be considered as merely illustrative.

Pilot initiatives	Brief overview
1. Innovation center for the West Region which could play a key role in the promotion of the innovative potential of the region.	This type of entity could coordinate, monitor and evaluate investment progress in the region, in order to identify potential bottlenecks and find appropriate solutions. In this context, the goal of an institutional framework to support innovation in West Region is to ensure the effective and efficient commissioning and implementation of smart specialization investments, and to maintain dialog and coordination with regional actors and with national authorities. In addition, the center would have the capability to launch fast-moving programs that would allow researchers to work directly with businesses while conducting research and to apply innovative solutions for technologies, products, marketing, management and information systems
2. An ICT competitiveness pole	Modern software applications and new "e-west region products" could be designed in order to accelerate competitiveness in areas such as marketing of agro- food products, management of natural resources, education, health, cultural and health tourism, among others. An initiative focused on ICT competitiveness would help to develop the innovative data base of the region (such as an E-Regional Market) which could be used to identify investors, co-operation partners and innovative investments. Innovative software applications would greatly also enhance the competitiveness of the tourism sector. Note: an example of e-market for innovation–

	http://www.harvard.ch/36-0-30-0/
3. A regional development fund focused on financing innovative projects in the West Region	Local financiers of innovation have expressed interest in establishing a seed fund which could finance regional innovative activity. This initiative may be complemented by regional resources to generate a fund-of-funds structure which can be designed to re-invest a share of the revenues from successful projects. By developing and offering targeted financial products to their partners, the type of fund would help to expand SME access to finance and could promote key EU objectives such as entrepreneurship, growth, innovation, research and development, as well employment. This regional fund could support public-private infrastructure investments and guide the available funding towards innovative projects. The establishment of a development fund for the West region – either for specific finance provision for technology oriented firms or for regional development purposes in general - would require an in-depth assessment and a feasibility study. However, there are some useful examples that could work as a model. The renowned *High Tech Gründerfonds* in Germany is a valuable example of a fund that provides funding for a wide range of innovative thematic areas.[54] Examples of a fund with a regional development component

[54] *High-Tech Gründerfonds* is funded through a PPP between the German federal government (Federal Ministry of Economics and Technology), the KfW and German industry (ALTANA, BASF, B. Braun, Robert Bosch, CEWE Color, Daimler, Deutsche Post DHL, Deutsche Telekom, Evonik, Qiagen, RWE Innogy, Tengelmann and Carl Zeiss). Its main goal is to provide a high tech Seed Fund aiming to enable start-ups to take their R&D plans through to the preparation of a prototype, a 'proof of concept' or to market launch. Usually High-Tech Gründerfonds invests €0.5 million in the seed stage and up to a total of €2 million per portfolio company in later rounds, and has about €560.5 million under management in two funds (€272 million HTGF I, €288.5 million HTGF II). The fund has approximately 240 companies in its portfolio, including Trademob, a mobile app marketing platform, 6Wunderkinder, the company behind Wunderlist and Wunderkit, fruux, a cross-platform synchronization service, Mister Spex, a large German online retailer for glasses, and plista, a recommendation platform. More details can be found at: http://www.en.high-tech-gruenderfonds.de/.

	include the Norrland Fund/Norrlandsfonden in Sweden[55]
4. Upgrade of the existing regional industrial parks and industrial areas to regional industrial and technology parks	In the West Region technology transfer can be ensured through the enhancement of the industrial parks located in Arad, Resita, Hunedoara and Timisoara, in order to create technology parks that can provide support services for innovative activities. The key industrial areas of the West region can also be upgraded to industrial and technology parks, based on demand assessments. The project could potentially be coordinated through the regional innovation center pilot initiative
5. Regional exhibition and training center	A regional multi exhibition and training center in the West Region can help to promote a diverse cultural and events agenda. The cultural and event strategy can become a key element to attract tourists. A balanced events agenda that includes events in each season is an important aspect of an attractive urban destination. Events constitute opportunities to discover the traditional heritage of the city presented in a different manner. In addition, the organization of major events can represent a good way to increase touristic flows during the low season.
6. Laboratory and innovation center for the auto industry	In order for the automotive sector to continue to grow in the medium term and remain globally competitive, firms in the West Region must increase levels of value added through

[55] The Norrland Fund/Norrlandsfonden is a foundation, established in the 1960s, that aims to promote the development of manufacturing and service enterprises in the five northernmost counties of Sweden; Norrbotten, Västerbotten, Västernorrland, Jämtland and Gävleborg. The fund finances business, primarily SMEs, at start-up, development and expansion stage. The products offered include flexible loans, convertible bonds, guarantees and grants (only for research and infrastructure projects). In addition to lending, the fund aims to shape the economic and VC infrastructure of the area. The preferred sectors of interest are those businesses that are technology based, or have or will use high technology to a large extent. The Norrland Fund's share often amounts to 25 percent of the total capital, so it often works in partnership with other funding entities such as banks, venture capitalists, local government etc. More details can be found at: http://www.norrlandsfonden.se/.

	the incorporation of more knowledge and technology in production. Although there are many foreign MNCs in the region, the transfer of technology and knowledge to local firms is insufficient, mostly due to the nature of the tasks undertaken by local firms. Establishment of research institutes and labs, such as a regional auto research institute and testing laboratory, would incentivize local firms to prepare prototypes, test their new designs, products and processes will and help them to become part of the global supply chain of MNCs. Once a firm is included in a supply chain, technology transfer and spillovers are likely to be accelerated. The labs would also provide opportunities to conduct frequent quality tests, thereby increasing the reliability of local producers.
7. Laboratory and innovation center for the textile industry	The services provided by the new structure can include: computer-aided design, contract quilting, contract yarn spinning, custom printing, fabric welding, textile designers services, custom embroidery, custom slitting, specialty weaving, testing end product, training and many more. These services would offer comprehensive solutions that help improve traceability, reduce losses and improve competitiveness. Efforts to support local firms should be complemented with improvements in the education system by adjusting university curriculum to the specific needs of the sector and by providing training programs to develop necessary skills and capacities for fashion design, product development, use of frontier technology in production, and marketing.
8. Laboratory and innovation center for the wood processing industry	A center for wood processing could focus on contract-based research and on the exploration of innovative solutions for business and research in the area of wood processing. It would aim to develop cooperation between businesses interested in applying or marketing research results and would conduct ongoing market analysis to establish scientific and commercial needs for the output of its work. The center would be designed to attract motivated young scientists,

	established scientists and qualified technical staff from West region and other regions of Romania. The new structure could be set-up as a partnership between regional wood producers and researchers who could contribute to ensure the sustainability of the project. The center could support the design of new products and technologies by offering entrepreneurs a series of services, such as business development consultancy, technology transfer support, or product certification. In addition, the center could help to create favorable conditions for businesses by providing workspace for commercially viable companies that use new technology, and by attracting investors.
9. Agro-food market center and a regional accredited laboratory for food safety and veterinary tests	In order to enhance the support infrastructure for the agro-food sector, a regional supply – demand market can be established to serve a large share of the small agro food firms and help them join the agro-food value chain in optimal conditions. The local producers of fruits and vegetables, which could supply inputs for food processing activities, would thus be able to produce and sell their products in an organized manner. This would help increase their competitiveness and their ability to join the production chain. The market will make use of modern trading technologies, including electronic marketing. The new structure could support the development of SME-focused infrastructure for improving quality, health and safety standards, such as accredited laboratories for food safety and veterinary tests, and would help provide financing measures as well as marketing initiatives including the development of a regional brand. These initiatives could help build capacity in the sector and help to enhance the competitiveness of food producers in the West Region.
10. Launch of feasibility study to assess regional priorities for land irrigation	Irrigation is a national issue that affects large scale crop farming and is perceived as a major

	bottleneck for future development, particularly considering the increasing requirements for higher yields and the effects of climate change. The Regional Development Agency of the West Region could launch a feasibility study to establish local land irrigation needs in order to design and build the necessary structures, together with the authorities in charge of the program for agriculture and rural development. This type of project can be financed under European Regional Development Fund (ERDF) or under European Agricultural Fund for Rural Development (EAFRD).
11. Innovation center for green energies and energy efficiency	This type of pilot initiative could help to develop a number of innovative projects to improve energy efficiency and the diversification of energy sources. The center could be set-up as a partnership between the key regional organizations involved in green energy and energy efficiency smart solutions. In this capacity it could play a key role in promoting collaboration between state authorities, academia, and the private sector in order to increase the level of local technical expertise regarding the use of resource efficient materials. It could also, in the medium and long term, support commercially sustainable projects in order to expand the production of energy efficient construction materials and appliances in the region, which may help to reduce the cost of such inputs and increase their use in local infrastructure. Raising awareness regarding regional initiatives, such as those managed by ROSENC (the regional sustainable energy cluster)[56] would encourage knowledge exchange and help local firms to improve competitiveness and become better connected to the latest technological developments in the field. For example, a project that this type of center could undertake would be the implementation of the green energy innovation system developed under the EU competitiveness

[56] http://rosenc.ro/en/

	program for urban and rural lightening. Green energy would be provided for villages in the region confronted with lack of electricity, as part of this project.[57]
12. Center for the protection and promotion of the national parks in the West Region	The region could highly benefit from the creation of a local network of ecotourism destinations supported by green infrastructures and the use of renewable energy. The initiative would have an overarching infrastructure component aiming to rehabilitate the facilities located in natural parks. A center could be established as a partnership between the local authorities, regional tourism operators, and researchers, who could contribute to ensure the sustainability of the project and could prepare an action plan for the rehabilitation, protection and appropriate use of the tourism opportunities of the region.
13. Geo therapy center	This type of initiative would aim to build and modernize medical facilities in spa resorts. This type of projects can be promoted in areas such as Buzias and Baile Calacea in Timis county; Moneasa and Lipova Bai in Arad county; Baile Herculane in Caras-Severin county; and Geoagiu Bai and Baile Calan in Hunedoara County. The pilot center could promote high standards and innovative solutions for anti-aging and medical tourism programs. The pilot center could also provide support for the regional network of spas resorts to improve the quality and standards of services
14. Pilot initiative on development solutions for the mining areas	Regional stakeholders and policy makers could launch a pilot initiative to support the economic development of the mining and industrial regions. In initial phase a task force can be set-up to identify and design smart solutions for the recovery of the Jiu Valley and for the efficient use of the natural resources located in the area. In the second phase, a detailed action plan can be designed and

[57] Details about the pilot green energy project managed by the Polytechnic University Timisoara and ICER – TM, for one village, are presented at the following link. http://www.upt.ro/pfe7.php.

	implemented, which would encompass the creation an innovation center for the reconversion of Jiu Valley. One type of innovation that could be explored by the center could be the development of new construction materials for thermal rehabilitation using waste deposits, or the production of improved energy hard coal materials. The center could be staffed by a core team of experts who would oversee the implementation of the action plan and facilitate collaboration on research projects.

Annex 3 - Use of Integrated Territorial Investments for sustainable development of the West Region

For the 2014-2020, the European Commission has proposed new instruments that can be used by the Member States and regions in order to promote the integrated development at territorial level. One of these instruments is the Integrated Territorial Investment (ITI), which is defined as being a territorial development tool that enables the implementation of a territorial strategy in an integrated manner while drawing funds from at least two different priority axes in the same or different programs. It is important to underline that ITIs can only be effectively used if the specific geographical area concerned has an integrated, cross-sectoral territorial strategy. The key elements of an ITI are: i) a designated territory and an integrated territorial development strategy; ii) a package of actions to be implemented; and iii) governance arrangements to manage the ITI.

The detailed analysis performed at the level of the West Regions revealed some territorial characteristics either of concentration of economic activity, as it is Timisoara-Arad conurbation, or areas lagging behind the rest of the region, such as the Jiu Valley or other poorer areas in Caraş-Severin and Hunedoara counties.

Taking into account the key elements of an ITI, the following three-pronged approach can be used for a sustainable territorial development within the West Region, financed from the operational program 2014-2020. First, the use of ITI for Timişoara-Arad area. Second, the use of ITI for Jiu Valley area. Third, the presentation of development priorities for Caraş-Severin and Hunedoara counties[58].

Integrated Territorial Investment for Timisoara – Arad growth pole. Under the current EU financed program - Regional Operational Programme 2007-2013, Timisoara and Arad are considered under distinct definitions. One is considered as a growth pole (Timisoara and the surrounding areas) while the second one (Arad) is defined as an urban development pole. Though classified as different categories, these two very close biggest towns of the region need to be managed under an integrated development approach. The creation of an ITI for Timisoara – Arad growth pole will help improving the internal connectivity with the 2 cities conurbation, which represents one of the most important challenges in addressing territorial disparities in the West Region. In order to further promote the spillover effects of Timişoara-Arad conurbation, the following interventions can be promoted within an integrated strategy:

- *Supporting the capacity of SMEs to engage in growth and innovation process*, by identifying and setting up some actors essential for the facilitating the activity aiming a large number of stakeholders, such as a stock exchange center, an accredited laboratory for food safety and veterinary tests or a laboratory and innovation center for textile industry.
- *Finalizing the restoration of the historical centers of the two cities*, and integrated them in a single tourism circuit.
- *Development and implementation of low carbon strategy for the cities* that will promote energy efficiency measures and reduce the use of cars, as well as the development of innovative solutions and business for a green city.

[58] ITI is an instrument that could have been used for Caras-Severin and Hunedoara as single territory. However, taking into account that a limited number of ITIs are to be promoted within the future operational programs (the main candidates for this approach being the growth poles), an integrated approach can be used for these two counties without being promoted as ITIs, even if the principles are the same.

Infrastructure to support the productive capacity of the Timisoara-Arad agglomeration and to facilitate connectivity between Timisoara-Arad and more peripheral parts of the region are also among the main priorities to be dealt with in order to facilitate commuting towards the areas with higher concentration of economic activities.

Integrated Territorial Investment Jiu Valley. Jiu Valley can become a flourishing area if appropriate measures are taken. By creating the ITI for Jiu Valley a strong partnership of the 6 small cities of Jiu Valley will be set-up able to participate in a structure aiming to design and apply consistent and innovative solution. An ITI for Jiu Valley is justified by the main characteristics of the region: old mining territory with poor population depending on mining activities, without other job opportunities and low level of attractiveness for investments bearing a permanent declining since 1990. Integrated measures are needed to ensure the regeneration of the region, focusing on: infrastructure rehabilitation to facilitate the connection between localities; regeneration of the old mines; development of a sustainable economic environment through measures for using the coal tailings in a smart way; and, creating conditions for business development and organizing vocational training in order to ensure an adequate labor force for private sector growth.

Some regeneration plans have been prepared and partially implemented during 2000-2007 under Phare (EU pre-accession program) or financed by the World Bank. The future EU programs should take into consideration and build on the existing experience and bring new solutions for the integrated development of this area. Pilot initiative on development solutions for the mining areas, not only for Jiu Valley, can be promoted.

Development priorities for Caraş-Severin and Hunedoara counties. The two less developed counties in the West Region, Caraş-Severin and Hunedoara, present the following common features: i) large areas of forestry; ii) mountain areas and natural parks that can be exploited for tourism purposes; and iii) significant number of archeological sites. In order to exploit their potential with a view of promoting economic growth in the region, the following priorities can be identified in a common development strategy at the level of the two counties:

- *Ensuring support for competitiveness of SMEs,* focusing on wood processing industry; this can include the development of a laboratory and innovation center for this sector;
- *Developing eco-tourism and cultural tourism through:*
    - Support for tourism clusters and cooperation networks between the mountain resorts (including spa resorts) and the local administration where the archeological sites are located;
    - Draft of strategies for the two types of clusters and promoting investments under different operational programs, as part of the regional development plan for the West Region;
    - Entrust the management of the strategy to an independent body that can be set-up within the RDA, following the growth poles coordinator model.
    - Developing connection infrastructure ensuring the mobility towards the resorts and other areas of interest.