

RIS3 Regional Assessment: Thessaly

**A report to the European Commission, Directorate General
for Regional Policy, Unit I3 - Greece & Cyprus**

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Alasdair Reid, Nicos Komninos, Jorge-A. Sanchez-P., Panayiotis Tsanakas

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1. Executive summary: Overall conclusions and recommendations

Smart specialisation and the regional innovation system

The expert team notes that the past initiatives in Thessaly have focused on the agro-food sector and related industries and the value chain links to agriculture. The regional specialisation pattern is relatively diversified and other sectors such as metal production and construction materials are also important and should be considered during the RIS3 design phase. Overall, the expert team **recommends** that there is a need to enhance competitiveness of regional firms in a cross-sectoral manner through improved integration of key enabling technologies, notably ICT. Strengthening the access of regional firms to knowledge intensive business services should also be considered as a priority since this would help to foster an overall enhancement of non-technological innovation (design, marketing, etc.).

The expert team cautions against investing considerable sums of money into new additional research and innovation infrastructures and instead **recommends** reinforcing and improving the effectiveness of the existing structures created over the last decades. The regional authority should consider merging the various intermediary bodies into a single regional business and innovation support agency and targeting advisory services and funding on a limited group of companies with export potential.

Recommendations on governance

Despite a long history, since 1994, of regional innovation strategies and actions (RITTS, RIS, RIS+, RIPT), the region of Thessaly remains a relatively peripheral player in the Greek innovation system. The relatively strong and long-standing regional innovation infrastructure (Technology Park, University, TEI, EBETAM, etc.), well-informed stakeholders and active business associations reinforces the paradoxical nature of this situation. Indeed, as outlined above, the region has a weak innovation performances and an innovation system characterised by low participation of the business sector in R&D and limited synergies among stakeholders.

A loss of faith in the effectiveness of a bottom-up strategy has led to a rather risky top-down approach considering the limited experience of the newly elected Regional Authority in designing and implementing R&I initiatives. The Region has formed an Operational Programme Design Group as well as eleven thematic working groups (including one on RTDI). However, the IMA and the Regional Authority are drafting the synthesis of these working groups without involving stakeholders.

For the 2014-20 period the Region intends to focus on a limited number of strategic priorities in the areas of health, tourism, and e-governance. However, after the open discussion with the regional stakeholders, it was revealed that this strategic vision is hardly based on consultation and active participation of regional actors.

The expert team **recommends** that during the 2014-20 period, firstly, funding for innovation through the regional operational programme should be focused on a limited number of strategic areas and build on past investments and existing institutions to ensure consistency of investment and economies of learning over time. Secondly, the strategy should be based on a bottom up approach reflecting the real needs and capabilities of the region and should be supported by the majority of stakeholders. Involvement of stakeholders is of particular importance, especially those with experience and a real understanding of the region and concrete proposals.

Recommendations on innovation policy

The Thessaly innovation system is characterised by a limited -yet significant- number of institutions with low level of collaboration and synergies among them. At this level, and due to the opportunities raised by its new role, the elected Regional Authority should act as a coordinator and a connecting mechanism for these identities. From the meeting organised by the IMA it was evident that many of these stakeholders are

willing to take part in the formulation of the RIS3 and to actively get involved in all stages of planning and implementation. The expert team **recommends** that

- The Regional Authority should focus on strengthening collaboration among stakeholders of the region in order to link elements of the innovation base and transform them into an integrated system.
- Potential RIS3 actions should be selected with respect to six criteria: (1) sustainability after the funding period, (2) creation of local capabilities, (3) integrated solutions to technology-production-market-funding, (4) leverage of private funds (5) number of beneficiaries, and (6) contributing to development goals of GDP and employment growth.

Recommendations on clusters

The Regional Authority should consider the possibility of:

- using cluster mapping to identify regional competences and assets; supporting clusters to meet the objectives of smart specialisation; replicating a competitive technology industrial cluster approach to facilitate the rapid spread of good practice and ideas; providing advice on methodology to develop clusters, including the creation of a cluster secretariat;
- strengthening cluster cooperation (local and international) to make connections to global value chains; facilitating cross-clustering and the identification of innovation opportunities at the interface between different clusters;
- creating one-stop-shops within existing structures for potential investors/SME start-ups; developing incubators, providing training and supporting the creation of business angel networks with professional standards and co-investment funds;
- Ensure a qualitative upgrade of the tourism sector to develop new alternative types of tourism (eco-tourism) and avoid a temptation to favour large, potentially unsustainable development. Specific funding measures and support should be developed aimed at tourism innovation and inter-linkages with other productive sectors (bio-agro-food, crafts, design, ICT, etc.);
- Seek to enhance the competitiveness of SMEs in the agricultural and fisheries sectors where aquaculture could be a key objective of the rural development policy; deploying incentives for the fishing sector to restructure fishing organisations, producers' organisations and other stakeholders; ensuring that support in rural areas is directed to young people through support for business start-ups in the agro-food/forestry sector.

Recommendations on ICT policy – broadband – eservices

In addition to covering the referred topics of the RIS3 strategy regarding ICT, the Region should put special emphasis in the ICT support to crucial sectors of the economy i.e. farming, food & beverages, manufacturing, tourism and health services.

Broadband expansion (both wireline and wireless) is crucial for improving the competitiveness of the whole economy and improving the quality of life.

The Region should investigate viable policy tools to provide incentives for new IT-enhanced products and services from local enterprises, and also award funds for the fast transformation of traditional businesses using ICT tools.

Special attention should be given to keeping the talented ICT professionals and attracting new ICT businesses by creating new and viable demand for innovative ICT services. The coverage of citizens in isolated areas is another important task that can be partly fulfilled by the deployment of reliable telemedicine and home-care services.

Particular emphasis should be placed in setting proper rules for the substantial involvement of the private sector of ICT, by assuming part of the risk of the planned investments.

2. Regional Innovation Performance and potential

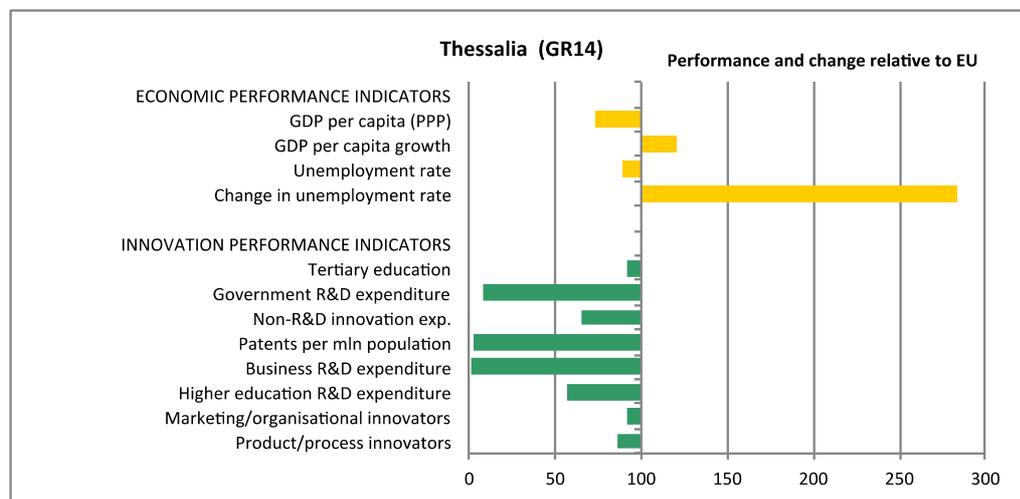
2.1 Regional profile and specialisation

Thessaly is located in the centre of mainland Greece and is formed of a mix of mountainous areas, a large fertile plain (notably wheat, cotton and livestock production), coastal zones and the Sporades islands in the Aegean sea. The region hosts 6.5% of the Greek population (2010, 735,700 inhabitants) making it the third largest region in terms of population¹. With a gross domestic capita (GDP) per capita of €17,000 (2009), the region is only the ninth wealthiest in Greece and has only 72% of the EU27 average income. However, like the rest of Greece, the region is hit by the economic crisis leading unemployment to increase to 16.8% in 2011 (7.8% in 2007).

In 2009, the tertiary sector accounted for 68.4% of the regional GDP and industry and construction sector 22.8%. However, Thessaly remains one of the major agricultural zones in Greece with a share of the primary sector in regional GDP of 8.75%. The tertiary sector is essentially tourism, retail and wholesale trade and transportation services. In the manufacturing sector, the larger firms are located mainly along the axis between the two largest cities, Volos and Larissa, and are active in medium to low technology sectors, such as food and beverages, textiles and wearing apparel, manufacture of furniture, manufacture of wood and of products of wood, manufacture of basic metals and manufacture of fabricated metal products.

According to data from the European Cluster Observatory (see Appendix F), Thessaly is relatively specialised² in the manufacture of structural metal products, cement, lime and plaster, and the maintenance and repair of office, accounting and computing machinery. Although the main regional employer is crop growing, market gardening and horticulture, it ranks only 8th in Europe when considering relative specialisation.

Figure 1 Summary benchmark of regional innovation performance



Source: Regional Innovation Monitor, data used is 2011 or latest available year. Trend data is over latest three year period for which data is available.

Despite its relative size and importance within the national economy, Thessaly has a weak research and innovation performance and lags behind within the national

¹ All data provided is sourced from Eurostat unless stated differently.

² The minimum degree of specialisation is 1.5 (meaning that the region has 50% more employment in the industry than the size of the region), and the industry must have at least 500 employees in the region (in order to eliminate high specialisations in very narrow industries).

innovation system. In 2005, the region invested only €30m in research and development (R&D) and accounted for only 2.6% of the national gross expenditure on R&D (GERD). Regional GERD was equivalent to 0.3% of GDP, considerably below the Greek (0.6%) and the EU27 (1.83%) averages. This under-performance is largely due to the low business sector investment accounting for only 1.77% of GERD (Greece, 31%; EU27 63%). In contrast, 89.7% of regional GERD occurred in the higher education sector (47.5% in Greece, 22.5% in EU27) and for 7.45% in the government sector (20.3% in Greece, 13.6% in EU27). Not surprisingly given the low level of business investment in R&D, the regional patenting activity is particularly low with 2.04 patents registered at the European Patent office per million inhabitants in 2008, against 8.04 in Greece and 111.58 for the EU27. According to the RIM report this would reflect the very low level of technological specialisation of the region. In addition, since 2008, private investments are strongly affected by the crisis, which would have most probably reduced further the already low levels of private R&D investments within the region.

Over the last decade, the educational level has improved with 24.4% of the population aged 25-64 with tertiary education in 2011 (2000: 14.4%) but is still below both the Greek (25.4%) and EU27 rates (26.8%). Lifelong learning rates are also low with only 1.6% of adults aged 25-64 participating in training (Greece: 2.4%; EU27 8.9%). In terms of Human Resources in Science and Technology (HRST), the regional has a relatively low share of the Greek total (5.7% in 2011), with HRST accounting for 28.4% of the regional workforce³. In 2005 (latest available data), there were 800 full-time equivalent (FTE) R&D personnel (0.25% of the regional active population compared to 0.69% in Greece and 0.95% in the EU27). Not surprisingly, most R&D personnel were in the higher education sector (89.7%), with only 43 FTE in businesses and 34 in the government sector. Looking specifically at researchers (0.16% of active population against 0.4% in Greece and 0.59% in EU27), 91% of the 515 regional researchers worked in the higher education sector and only 32 in businesses. The low number of researchers in regional firms was confirmed by a 2008 survey⁴, conducted by the Regional Innovation Pole, of 115 regional firms which found that only 24% employed R&D personnel on a permanent basis (13% in small firms, 40% in large firms). However, a significant share used part-time or ad hoc staff to conduct R&D.

In terms of scientific activity and specialisation, the University of Thessaly (UTH) has increased annual scientific output⁵ from 31 publications in 1996 to 452 in 2010. From 2006-10, the UTH had 2,136 publications (32% with international collaboration) or 5.2% of total Greek academic publications, and a citation impact of 0.84. The main scientific fields of the UTH are medical and health sciences (1,071 publications from 2006-10, citation impact of 0.85) and natural sciences (776, 0.79). There is also some activity in engineering and technology but only 238 publications in agricultural sciences although the citation impact is higher than for the other fields (0.93). The Technological Education Institute (TEI) of Larissa produced 170 publications from 2006-10 and was ranked fourth out of the 16 Greek TEI, but the citation impact is relatively low at 0.64. The TEI Larissa is particularly active in natural sciences (94, 0.62), engineering and technology (56, 0.67) and agricultural sciences (46, 0.74). To sum up, the two HEI do have some degree of specialisations in technologies relevant for the regional business structure as well as emerging fields of specialisation.

³ This indicator gives the percentage of the total labour force in the age group 15-74, that is classified as HRST, i.e. having either successfully completed an education at the third level or is employed in an occupation where such an education is normally required.

⁴ A questionnaire of 50 questions was sent to 115 industrial firms. The firms selected in the survey were in the upper part of the regional distribution, that is, the largest and more established industrial firms in Thessaly, with a total employment representing 12% (7,326 employees) of the total regional industrial employment. The analysis divides the sample in three size classes in order to detect differences in the performance and behavior of small (1-20 employees), medium (21-50) and large (over 50) firms.

⁵ <http://metrics.ekt.gr/en/report02/index>

The European Regional Innovation Scoreboard⁶ ranks Thessaly (grouped in the mega-region Voreia Ellada) as a modest-high innovator (the lowest of four performance categories) along with all other Greek regions aside from Attica. Similarly, the 2011 Regional Innovation Monitor (RIM) annual report classified the region amongst a group of knowledge absorbing innovating regions (again along with all other Greek regions except Attica). From a positive perspective, this group of 19 EU27 regions has the highest average score (amongst the RIM regional grouping) on ‘innovative entrepreneurship’ (based on the share of SMEs that declare to have introduced innovations in the Community Innovation Survey) but the lowest score on ‘technological innovation’: business R&D and patenting is very low, while the non-R&D innovation expenditures (as a % of turnover) are higher than in any other group. This implies, as would be expected, that innovation mostly takes place through purchasing ‘off-the-shelf’ technologies.

Despite this weak innovation performance, the 2008 survey by the Regional Innovation Pole of Thessaly (reported in Petrakos et al., 2011) of regional businesses found that labour productivity had increased between 2004-8. The survey further underlined that the vast majority of business activity is based on regional or national demand with limited export orientation, notably of smaller firms, suggesting a low level of international competitiveness of regional firms. In general, regional industrial firms considered the main advantage of the region is its central geographic position and its potential access to national markets. However, they were not satisfied by the quality of infrastructure, human resources and financial support for investment; and the lowest score was given to the nascent business support services in the region.

Figure 2 : SWOT of regional innovation potential and specialisation – Thessaly

Strengths	Weaknesses
<ul style="list-style-type: none"> • Good quantity and quality of scientific production • Improving education level of the population • Presence of regional academic research capacities • Central geographic position • Mixed economic structure with niche in primary and manufacturing sector and tourism services 	<ul style="list-style-type: none"> • Low R&D investment intensity notably by business sector • Traditional economic structure dominated by small low-tech companies • Low level of ICT diffusion and use • Low level of life-long learning practices • Low level of science-business collaboration • Lack of innovation culture within firms
Opportunities	Threats
<ul style="list-style-type: none"> • Opportunities for increased interaction between science-industry at regional level to develop new business niche through public-private partnerships (e.g. health, bio-energy, etc.) • Under-exploited agro-food and bio-economy potential • Potential for higher-value added tourism in both mountain, eco- and traditional coastal tourism 	<ul style="list-style-type: none"> • Economic specialisation in low-tech sectors • Environmental degradation from unsustainable agricultural practices and manufacturing waste • Competition from low-cost economies • Brain drain

According to Petrakos et al. (2011), these results suggest that targeted policies, carefully structured investment incentives, and campaigns would be required in order to challenge the regional ‘autarkical’ entrepreneurial culture. Firms, in particular, smaller ones, need incentives and guidance to cooperate with each other. In the absence of internal economies of scale, they ought to seek to improve their collective efficiency and to improve their cooperation with the regional research base, as a potential source of solutions to a wide range of technical or operational problems.

⁶ MERIT & Technopolis 2012, http://ec.europa.eu/enterprise/policies/innovation/files/ris-2012_en.pdf

The expert team notes that the past initiatives in Thessaly have focused on the agro-food sector and related industries and the value chain links to agriculture. The regional specialisation pattern is relatively diversified and other sectors such as metal production and construction materials are also important. Overall, the expert team **recommends** that there is a need to enhance competitiveness of regional firms in a cross-sectoral manner through improved integration of key enabling technologies, notably ICT. Strengthening the access of regional firms to knowledge intensive business services should also be considered as a priority since this would help to foster an overall enhancement of non-technological innovation (design, marketing, etc.).

2.2 The strengths and weaknesses of the regional innovation system

The main regional research performers (see also Appendix C) are the University of Thessaly founded in 1984 with over 12,000 students, the TEI of Larissa, the Centre for Research and Technology – Thessaly (CE.RE.TE.TH, created in 2006), the Technology Park in Volos and the Regional Innovation Pole of Thessaly established in 2006.

Petrakos et al. (2011) highlights that although significant progress has been made in basic and applied research in the region, the interaction of the academic world with the local economy is still limited, which impedes a cross fertilisation of the academic knowledge with the regional economic capacities. In terms of co-operation patterns, about one third of the firms, keeping in mind that the firms in the sample are local leaders, had co-operated with the University of Thessaly, about a quarter with the TEI and 20% with the regional research centres. Promisingly, about 35% of the firms declared that they would like to cooperate in the future with the University and 50% with the research centres.

Both the RIP Thessaly and CERETETH can be viewed as efforts to structure the scientific know-how. The main objective of the Regional Innovation Pole of Thessaly (RIPT) was to support a development strategy in three main areas, to explore and take advantage of the regional the primary agricultural production, by supporting three industrial sectors: Food Processing, Agro Materials, cultivation of crops for production biofuels. During the meeting with stakeholders, divergent views were expressed on the outcomes of the RIPT.

CERETETH is structured in four main departments: Mechatronics, Agrotechnology, Biomedical and Kinesiology and was created in order to get round the administrative and legal restrictions placed on the way Greek Universities can operate in terms of securing project funding, recruiting staff, co-operating with industry, etc. The centre is therefore more a means of managing research projects, including applied research, secured by staff of the university (and to some extent the TEI) rather than an autonomous centre (this is evident from the personnel structure outlined in the 2011 business plan, 40 staff in 2009 of which 15 PhD students and 13 administrative staff). Nevertheless, it may be considered as a basis for the further development of more structured relationships between the higher education and public research potential and industry in the region.

Finally, in terms of intermediaries, there are a number of long-standing business and agricultural associations, local development agencies (e.g. ANKA for Karditsa), etc. that operate on a project by project basis to deliver business support or rural development (LEADER) etc. initiatives. Aside from EBETAM (MIRTEC), which is the Greek multidisciplinary multi-technology laboratory for testing and certification of industrial and consumer products, materials, facilities, and systems management, there are however, no specialist technology or innovation advisory services.

The expert team cautions against investing considerable sums of money into new additional research and innovation infrastructures and instead **recommends** reinforcing and improving the effectiveness of the existing structures created over the last decades. The regional authority should consider merging the various intermediary bodies into a single regional business and innovation support agency and targeting advisory services and funding on a limited group of companies with export potential.

3. Stakeholder involvement and governance of research and innovation policies

3.1 Stakeholder involvement in strategy design and implementation

Despite a long history, since 1994, of regional innovation strategies and actions (RITTS, RIS, RIS+, RIPT), the region of Thessaly remains a relatively peripheral player in the Greek innovation system. The relatively strong and long-standing regional innovation infrastructure (Technology Park, University, TEI, EBETAM, etc.), well-informed stakeholders and active business associations reinforces the paradoxical nature of this situation. Indeed, as outlined above, the region has a weak innovation performances and an innovation system characterised by low participation of the business sector in R&D and limited synergies among stakeholders.

The regional authority noted that the numerous support mechanisms and initiatives established in the region since the late '90s tended not to survive after the end of funding. As many of these initiatives were developed either after public consultation or with the participation of regional stakeholders, the Regional Authority seems to have lost faith in the effectiveness of a bottom-up strategy. This is leading to a rather risky top-down approach considering the limited experience of the newly elected Regional Authority in designing and implementing R&I initiatives. In the 2007-13 period the design and implementation of RDTI policies were centralised by the GSRT. However, the Region intends to ensure that in the new programming period, the policy is designed and delivered via a regional development strategy.

To date, the Region has formed an Operational Programme Design Group as well as eleven thematic working groups (including one in the field of RTDI). However, the synthesis of the outputs of these working groups is being drafted mainly by employees of the IMA and the Regional Authority without the involvement of stakeholders from the private sector and academia. In order to encourage participation and to integrate the opinion of local stakeholders, the IMA has distributed questionnaires on the formulation of strategic priorities for the 2014-20 period.

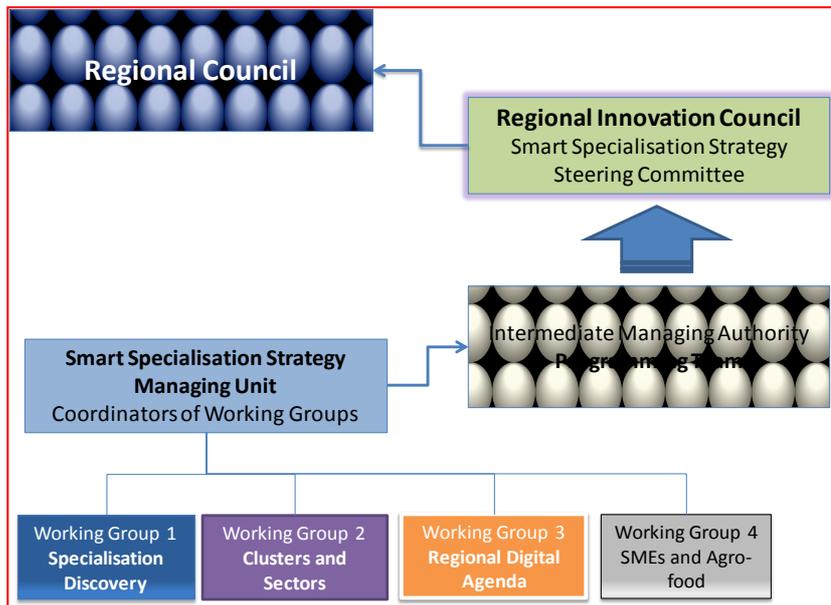
The Regional Authority appears to have already decided on strategic priorities for the next programming period that were described during the internal meeting with the REGIO experts organised by the IMA on 2nd October 2012. However, following the roundtable with the regional stakeholders, it was clear that this strategic vision is not based on consultation and active participation of regional actors.

During the meeting with the stakeholders, many participants mentioned the need to simplify procedures in terms of funding as well as to reduce bureaucracy. There is also a need for the Regional Authority to recognise that supporting fragmented initiatives without consistency over time will have the same negative outcome as in the past. The new strategy should focus on a limited number of priority issues with the support of stakeholders such as the HEIs and the Technology Park, taking advantage of the know-how created from the RIPT, which was positively assessed by a majority of stakeholders. Finally, there is a need to mobilise significant private funds in any future initiatives, although this will be a hard task due to the financial crisis.

The expert team **recommends** that during the 2014-20 period, firstly, funding for innovation through the regional operational programme should be focused on a limited number of strategic areas and build on past investments and existing institutions to ensure consistency of investment and economies of learning over time. Secondly, the strategy should be based on a bottom up approach reflecting the real needs and capabilities of the region and should be supported by the majority of stakeholders. Involvement of stakeholders is of particular importance, especially those with experience and a real understanding of the region and concrete proposals.

The bottom up process can be modelled (see diagram) on the proposal made to other Greek regions: (1) the institution of a process that guarantee bottom-up planning

along the entire planning process and, (2) technical support that will facilitate the technological discovery process of required technologies and niche markets for regional products.



3.2 Multi-level governance and synergies between policies and funds

The draft strategy developed by the region is to a certain degree aligned with the priorities set on a national and European level. The regional authority expects a local design, management and implementation of regional funds without an intervention from the central government. Lack of involvement in the tasks of design and implementation by the regional authorities during the current period should not be an obstacle to developing synergies with the national strategy. In addition, the region should be open for collaboration with other regions. The expert team **recommends**

- RIS3 funding should cover all funds that will become available in the region from the regional and national OPs.
- The region should develop synergies with other regions with similar problems or due to links between stakeholders, such as with Sterea Ellada for business growth (given the joint Association of Industries for Thessaly and Sterea Ellada).

3.3 Vision for the Region

In the 2007-2013 Operational Programme, the vision of the region is: “*Accelerating real convergence, spatial-economic and social cohesion and sustainability of the Region, through its elevation into a dynamic Greek regional pole with distinctive identity in terms of qualitative and technologically innovative industrial, agro-food and ecotourism sector, but also in terms of cultural identity within Europe but also internationally*”. The main objectives included economic convergence to the EU average within 15 years, the constant pursuit of sustainability, as well as the enhancement of social and spatial cohesion through the reduction of inequalities, fighting of unemployment, and elimination of social exclusion etc (OP Thessalia – Stereas Ellada 2007-2013, pp. 135-137).

For the 2014-20 period, the Regional Government intends to focus on a limited number of strategic priorities and strengthen areas that considers as important. The preliminary strategy of the Region, which was described to the expert team, is to focus on the areas of health, tourism and e-governance. However, during the round-table

discussion with the region’s stakeholders, it was rather suggested that the region should focus on economic restructuring and shift to a new development model.

The expert team **recommends** that the region of Thessaly should ensure that the adopted vision truly corresponds to the region’s competitive advantages and reflects the choices of stakeholders. The strategy should include specific objectives for sectors of particular importance such as manufacturing, agriculture and tourism.

4. Towards a regional smart specialisation strategy

4.1 Current regional research and innovation policy

The 2007-14 Regional Operational Programme (ROP) for Thessaly-Stereia Ellada-Epirus has three priorities for Thessaly (see Figure 3) including one on digital convergence and entrepreneurship (Figure 4). The total ROP public expenditure allocated to Thessaly is €604m (i.e. 33,1% of the total ROP). The digital convergence and entrepreneurship priority accounts for a little over 20% of funding. Research and innovation had a relatively low priority within the current ROP.

Figure 3 Priorities and funding of OP Thessaly 2007-2013

Priority axis	Total funding EU + national	%
1. Infrastructure and accessibility	142.050.000	23,51
2. Sustainable development and quality of life	327.900.000	54,26
3. Digital convergence and entrepreneurship	122.700.000	20,30
Technical support	11.635.714	1,93
TOTAL	604.285.714	100,00

Figure 4 Current regional R&I priorities, OP Thessaly 2007-2013

Policy Documents	Digital Convergence and Entrepreneurship for the Region of Thessaly
<p>Operational Programme of Thessaly, Sterea Ellada, Epirus 2007-2013, Athens 2007</p> <p>Επιχειρησιακό Πρόγραμμα Περιφέρειας Θεσσαλίας, Στερεάς Ελλάδας, Ηπείρου, 2007-2013, Αθήνα 2007</p>	<p>1. Improving the competitiveness of Thessaly local products and services especially quality products of certified quality</p> <p>2. Enhance openness of the Thessaly economy</p> <p>3. Strengthening entrepreneurship, new technologies and innovation</p> <p>Regarding development and competitiveness, the strategy poses as a general objective true convergence. In addition, it includes the improvement of competitiveness of regional products and services of certified identity, the diffusion and adoption of new technologies (e.g. digital) and innovation and the inclusion within international entrepreneurial and research networks.</p> <p>Regarding digital convergence, the strategy sets as general objective the improvement of productivity with the use of ICT. This can be achieved through the promotion of ICT to enterprises, the provision of digital services, the promotion of local entrepreneurship in areas that use ICT etc.</p>

As noted above available funds for research and innovation from the ROP were centralised under the management of the GSRT in the national OP for Competitiveness. By October 2012 (see Appendix E), 112 RTDI projects from Thessaly based organisations had been awarded funding from the GSRT amounting to a total budget of only €7m or 2.96% of the national total. Some 66% of the funding was awarded to enterprises and 30% to research organisations. In terms of thematic focus, 42% of the funding is allocated to engineering and technology projects followed by medical sciences (25%) and agricultural sciences (21%). A second thematic classification suggests that agriculture, farming and food/biotechnology projects were the main focus (29%) of all project funding, followed by high value added products and technologies in traditional industries (20%) and ICT projects (17%).

In terms of future policies, it is worth noting, that in the 2008 RIPT survey, the three most popular policy measures were the provision of information (63%), cooperation with Universities and Research Centres (59%) and investment incentives for clusters (56%). These results suggest that firms recognise their weaknesses, which are limited specific knowledge, lack of cooperation with the research base of the region and lack of inter-firm cooperation. Other policies receiving a significant support from the firms include best practices transfer from abroad (47%), subsidies for innovative activities (46%) and better local support mechanisms (45%).

As noted above, the Thessalian innovation system is characterised by a limited -yet significant- number of institutions with low level of collaboration and synergies among them. At this level, and due to the opportunities raised by its new role, the Regional Authority should act as a coordinator and a connecting mechanism for these identities. From the meeting organised by the IMA it was evident that many of these stakeholders are willing to take part in the formulation of the smart specialisation strategy and to actively get involved in all stages of planning and implementation.

The expert team were left with the impression that the strategy developed by the Region of Thessaly includes a limited set of targeted priorities that do not correspond to the regional productive structure and needs; moreover, they do not seem to have the consent of the regional stakeholders. Hence, we recommend:

- The Regional Authority should focus on strengthening collaboration among stakeholders of the region in order to link elements of the innovation base and transform them into an integrated system.
- Potential RIS3 actions should be selected with respect to six criteria: (1) sustainability after the funding period, (2) creation of local capabilities, (3) integrated solutions to technology-production-market-funding, (4) leveraging private funds, (5) number of beneficiaries, and (6) contribution to development goals of income and employment creation.

4.2 Cluster policies

In Thessaly, the more traditional sectors are loosely connected to the regional innovation system and with the exception of a few cases there are no collaboration schemes or facilitators or sectoral associations active; in more high-tech sectors connections to the regional innovation system are improving. The RIPT had an impact but was not sustainable and stopped operations after the public funding ended.

Box 1 Cluster – Size, Specialisation and Focus in Thessaly

Size⁷, Specialisation⁸ and Focus⁹ in Thessaly is mainly around *Farming and Animal Husbandry* with 3 stars in the Cluster Observatory start system, and *Agricultural*

⁷ The 'size' measure shows whether a cluster is in the top 10% of all clusters in Europe within the same cluster category in terms of the number of employees. If employment reaches a sufficient share of total European employment, it is more likely that meaningful economic effects of clusters will be present. Those in the top 10% receive one star.

⁸ The 'specialisation' measure compares the proportion of employment in a cluster category in a region over the total employment in the same region, to the proportion of total European employment in that cluster category over total European employment. If a region is more specialised in a specific cluster category than the overall economy across all regions, this is likely to be an indication that the economic effects of the regional cluster have been strong enough to attract related economic activity from other regions to this location, and that spill-overs and linkages will be stronger. If a cluster category in a region has a specialisation quotient of 2 or more it receives a star. If a cluster category in a region has a specialisation quotient of 2 or more it receives a star.

⁹ The 'focus' measure shows the extent to which the regional economy is focused upon the industries comprising the cluster category. This measure relates employment in the cluster to total employment in the region. If a cluster accounts for a larger share of a region's overall employment, it is more likely that spill-over effects and linkages will actually occur instead of being drowned in the economic interaction of

Products and Tobacco with 2 stars. *Processed Food* and *Construction* are also significant sectors with 1 star in the Cluster Observatory start system.

Overall, **sector-specific support services** have been only partially deployed and tested in Thessaly, such as, the Regional Innovation Pole of Thessaly. However, in the 2008 RIPT survey, the majority of firms considered that there was need for cooperation in the majority of fields (production, promotion, product design, product distribution, supplies). However, the only areas in which a majority of firms expect benefits from cooperation are joint research for new product development (53.6%) and acquisition of know-how (57.5%). The analysis by size shows that small firms are in general less willing to cooperate than large firms. The minority of the firms that are willing to engage in cooperation prefer on average to cooperate with competitors rather than upstream or downstream-related business. They also tended to have a slight preference for local cooperation. Petrakos et al. (2011) consider that these two elements may be a starting point for the design of regional cluster policies.

Entrepreneurial and Innovation Support Services (kind of **one-stop-shops**) have been underpinned in Thessaly by numerous institutions, incubators, associations or projects. Despite the efforts of such intermediaries the coordinated collaboration between innovation actors is limited. The RIPT survey found that the industrial firms of Thessaly have not introduced any change at all in the domains of marketing (58%), administration (56%), advertisement (66%) and exports policy (62%) over the two years preceding the survey. This suggests that there is scope for competitive gains from both technological and non-technological advisory services to regional firms.

An **incubator** has been created via national OP funding but has not achieved a critical mass of innovative firms. It offers incubator and one-stop-shop services to start-ups, SMEs, investors and other actors. Furthermore, in Thessaly there are three **Industrial Areas** that have good critical mass but are not sector specific. As might be expected, there are no regional **venture capital funds**, nor even business angel networks in Thessaly. The commercial banks are limited to providing standard business traditional loans but access for these are now scarce due to the financial crisis. However, two regional cooperative banks operate in the region (Box 5).

It is **recommended** that the Regional Authority should consider:

- using cluster mapping to identify regional competences and assets; supporting clusters to meet the objectives of smart specialisation; replicating the competitive technology industrial cluster approach of the mi-Cluster to facilitate the rapid spread of good practice and ideas; providing advice on promoting clusters, on what methodology to use to develop clusters, including the creation of a regional cluster secretariat.
- strengthening cluster cooperation (local and international) to make connections to global value chains; facilitating cross clustering and the identification of innovation opportunities at the interface between different clusters.
- creating one-stop-shops within existing structures for potential investors/SME start-ups; developing incubators, providing training and supporting the creation of business angel networks with professional standards and co-investment funds;
- ensuring a qualitative upgrade of the tourism sector to develop new alternative types of tourism (eco-tourism) and avoid a temptation to favour large, potentially unsustainable development. Specific funding measures and support should be developed aimed at tourism innovation and inter-linkages with other productive sectors (bio-agro-food, crafts, design, ICT, etc.);

other parts of the regional economy. The top 10% of clusters which account for the largest proportion of their region's total employment receive a star.

- seeking to enhance the competitiveness of SMEs in the agricultural and fisheries sectors where aquaculture could be a key objective of the rural development policy; deploying incentives for the fishing sector to restructure fishing organisations, producers' organisations and other stakeholders; ensuring that support in rural areas is directed to young people through support for business start-ups in the agro-food/forestry sector.

4.3 Digital economy and ICT policies

In Thessaly, demand for ICT products and services is the lowest amongst the Greek Regions due to low income and the lack of “digital” skills in a large portion of the citizens. According to the “Internet Users in Greece” survey (March 2010)¹⁰, both PC and Internet usage was at around 29% of the population. A quite small number of very small ICT enterprises are present in the Region, focusing on system integration, maintenance, and software support for state agencies and for the local industries. Neither the University nor the TEI is highly specialised in ICT. As demand for ICT jobs is limited, young ICT graduates are likely to move to other regions, thus creating additional challenges to any ICT revival effort.

Most ICT projects that have been implemented during the 2007-13 period were through the national OP and included metropolitan access optical networks (MAN), municipal wireless hot-spots, local e-government services, tourism-related applications, the development of content for the disabled, digitising of cultural archives, natural disaster management system, and the linking the HEI and schools to the national research and education network and the Internet.

According to the preliminary strategic directions of the Region¹¹, the following sectors are best suited to benefit from modern ICT tools and technologies:

Farming: represents a significant portion of the regional economy, with growth potential if combined with modern ICT tools. The local agriculture enterprises are in urgent need to accommodate modern control, administration, monitoring, marketing, and logistics tools. Added value bio-agricultural and alternative agriculture producers can benefit from internet-based marketplace participation, to widen their distribution channels and optimise branding, procurement, packaging etc. Farmers could also be supported to optimise their production activity, by employing modern control and monitoring tools, especially in reducing water consumption in irrigation, and cutting the cost of energy by using renewable sources.

Food & Beverages: SMEs in food and beverages can also improve their profit margins by better branding and advertising, using new-generation ERP and CRM tools, along with e-commerce and procurement platforms.

Manufacturing: the existing production sites of the plastics, metal, textile, and cement industries should be supported to improve their competitiveness, by applying modern ICT tools in the production chain, as well as in marketing, planning and procurement.

Tourism: the Region includes some areas of unique natural beauty, capable to attract a significant number of visitors. SMEs should be motivated to exploit modern internet-based technology and synergies to maximize the outreach of the Region, minimise management and advertising costs, and thus create more and better jobs.

E-government and learning: the low level of regional IT skills implies that the cost of dealing with the regional public services is enormous for both citizens and regional and national government. There is no master plan for e-government services and most

¹⁰ Ταυτότητα χρηστών internet στην Ελλάδα”, Παρατηρητήριο για την ΚτΠ, Μάρτιος 2010. http://www.observatory.gr/files/meletes/A100526_%CE%A0%CF%81%CE%BF%CF%86%CE%AF%CE%BB%20%CF%87%CF%81%CE%B7%CF%83%CF%84%CF%8E%CE%BD%20internet%202010.pdf

¹¹ “Η Θέση της Περιφέρειας Θεσσαλίας στο Εθνικό, Ευρωπαϊκό και Διεθνές Περιβάλλον”, Περιφέρεια Θεσσαλίας, Νοέμβριος 2012.

(cadastre, e-prescription, e-invoicing, etc) are administered by national authorities. However, other e-services, like local taxation or regional permits, could be administered regionally. All e-government services should adhere to well-defined interoperability standards, and be based on dependable cloud computing platforms¹². Properly designed and interoperable e-government apps would be a major contribution towards efficiency and transparency. These services could be easily combined with proper initial training applications, to overcome the barriers of low IT skills. The region should also to prepare an inventory of ICT infrastructure.

Health: health services are beyond reach for several citizens living in remote mountainous or insular locations. This problem can be partially solved by using new telemedicine or home-care services. The Region should provide support to the private sector, to deploy affordable telemedicine or home-care platforms, for selected citizens. These services would be provided as public-private partnerships (PPPs), in cooperation with local state hospitals and health centres, to ensure sustainability.

Broadband Internet: the availability of affordable broadband connections for all the households is a major European target. The Region should complement all the related national- and EU-level actions, to further extend broadband in the Region. More specifically, it should help making local Industrial Zones/Parks as “FttH-ready”, i.e. bringing fibre connectivity to each hosted enterprise. It is also crucial to facilitate additional actions like setting-up of public free-access hot-spots in public places, in ports, schools, sports/recreation areas, churches, etc. The Region should also investigate ways to improve the utilisation of existing MANs, and provide proper incentives for the fast expansion of next generation cellular networks (e.g. LTE). In the 2014-20 regional strategy, there is no reference to viable plans for the deployment of new, and the extension of existing NGA networks.

Finally, the Region should consider a flexible mechanism, tailored for its particular size and needs, to ensure a substantial private sector involvement in the project cycle and risk sharing. This can be best carried out by flexible PPPs, or by the establishment of targeted ICT Vouchers for selected households or SMEs.

Active involvement of the private sector in ICT activities has to be addressed by the Region, in a way to both leverage community funding and improve sustainability, especially for the delivery of products and services.

5. Monitoring and evaluation

The capabilities for monitoring, evaluation and analysis of innovation programmes and performance should be further solidified and embedded in both the new regional government structures and the wider partnership. A specific budget line could be set aside for a partnership based regional innovation observatory that could fund studies and doctoral/post-graduate research into innovation practice in regional firms, etc.

Guidance on evaluation methodologies for innovation measures is already available for the 2014-20 period¹³ and the IMA, regional authorities, etc, should make themselves aware of and use such materials to develop an evaluation plan. At a minimum, one official should be specifically tasked with setting up an evaluation and monitoring system for innovation measures in the IMA.

¹² http://ec.europa.eu/information_society/activities/cloudcomputing/docs/com/com_cloud.pdf

¹³ See: <http://bit.ly/Igzx5T>

Appendix A List of people attending regional workshop

1. ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
2. ΜΟΝΑΔΑ ΚΑΙΝΟΤΟΜΙΑΣ ΚΑΙ ΕΠΙΧΕΙΡΗΜΑΤΙΚΟΤΗΤΑΣ (ΜΟ.Κ.Ε.) ΤΟΥ ΠΑΝΕΠΙΣΤΗΜΙΟΥ ΘΕΣΣΑΛΙΑΣ
3. Α.Τ.Ε.Ι. ΛΑΡΙΣΑΣ
4. ΜΟΝΑΔΑ ΚΑΙΝΟΤΟΜΙΑΣ & ΕΠΙΧΕΙΡΗΜΑΤΙΚΟΤΗΤΑΣ (ΜΚΕ) Α.Τ.Ε.Ι. ΛΑΡΙΣΑΣ
5. ΠΑΝΕΠΙΣΤΗΜΙΑΚΟ ΝΟΣΟΚΟΜΕΙΟ ΛΑΡΙΣΑΣ
6. ΚΕΝΤΡΟ ΕΡΕΥΝΑΣ & ΤΕΧΝΟΛΟΓΙΚΗΣ ΑΝΑΠΤΥΞΗΣ ΘΕΣΣΑΛΙΑΣ (ΚΕΤΕΑΘ)
7. ΕΤΑΙΡΕΙΑ ΒΙΟΜΗΧΑΝΙΚΗΣ ΕΡΕΥΝΑΣ & ΤΕΧΝΟΛΟΓΙΚΗΣ ΑΝΑΠΤΥΞΗΣ ΜΕΤΑΛΛΩΝ (ΕΒΕΤΑΜ ΑΕ)
8. ΤΕΧΝΟΛΟΓΙΚΟ ΠΑΡΚΟ ΘΕΣΣΑΛΙΑΣ Α.Ε.
9. ΕΛΓΟ ΔΗΜΗΤΡΑ (ΕΘΙΑΓΕ) ΛΑΡΙΣΑΣ
10. ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΙΔΡΥΣΗΣ, ΟΡΓΑΝΩΣΗΣ, ΔΙΑΧΕΙΡΙΣΗΣ & ΛΕΙΤΟΥΡΓΙΑΣ ΒΙ.ΠΕ. (ΕΤΒΑ ΒΙΠΕ ΑΕ)
11. ΤΕΧΝΙΚΟ ΕΠΙΜΕΛΗΤΗΡΙΟ ΕΛΛΑΔΑΣ - ΤΜΗΜΑ ΚΕΝΤΡΙΚΗΣ & ΔΥΤΙΚΗΣ ΘΕΣΣΑΛΙΑΣ
12. ΤΕΧΝΙΚΟ ΕΠΙΜΕΛΗΤΗΡΙΟ ΕΛΛΑΔΑΣ - ΤΜΗΜΑ ΜΑΓΝΗΣΙΑΣ
13. ΓΕΩΤΕΧΝΙΚΟ ΕΠΙΜΕΛΗΤΗΡΙΟ ΕΛΛΑΔΑΣ - ΠΑΡΑΡΤΗΜΑ ΚΕΝΤΡΙΚΗΣ ΕΛΛΑΔΑΣ
14. ΟΙΚΟΝΟΜΙΚΟ ΕΠΙΜΕΛΗΤΗΡΙΟ ΘΕΣΣΑΛΙΑΣ
15. ΕΠΑΓΓΕΛΜΑΤΟΒΙΟΤΕΧΝΙΚΟ ΕΠΙΜΕΛΗΤΗΡΙΟ ΚΑΡΔΙΤΣΑΣ
16. ΕΠΑΓΓΕΛΜΑΤΟΒΙΟΤΕΧΝΙΚΟ ΕΠΙΜΕΛΗΤΗΡΙΟ ΛΑΡΙΣΑΣ
17. ΕΠΑΓΓΕΛΜΑΤΟΒΙΟΤΕΧΝΙΚΟ ΕΠΙΜΕΛΗΤΗΡΙΟ ΜΑΓΝΗΣΙΑΣ
18. ΕΠΑΓΓΕΛΜΑΤΟΒΙΟΤΕΧΝΙΚΟ ΕΠΙΜΕΛΗΤΗΡΙΟ ΤΡΙΚΑΛΩΝ
19. ΣΥΝΔΕΣΜΟΣ ΘΕΣΣΑΛΙΚΩΝ ΒΙΟΜΗΧΑΝΙΩΝ
20. ΣΥΝΔΕΣΜΟΣ ΒΙΟΜΗΧΑΝΩΝ ΘΕΣΣΑΛΙΑΣ - ΚΕΝΤΡΙΚΗΣ ΕΛΛΑΔΑΣ
21. ΕΝΩΣΗ ΑΓΡΟΤΙΚΩΝ ΣΥΝΕΤΑΙΡΙΣΜΩΝ ΛΑΡΙΣΑΣ - ΤΥΡΝΑΒΟΥ – ΑΓΙΑΣ
22. ΕΝΩΣΗ ΑΓΡΟΤΙΚΩΝ ΣΥΝΕΤΑΙΡΙΣΜΩΝ ΦΑΡΣΑΛΩΝ
23. ΕΝΩΣΗ ΑΓΡΟΤΙΚΩΝ ΣΥΝΕΤΑΙΡΙΣΜΩΝ ΕΛΑΣΣΟΝΑΣ
24. ΕΝΩΣΗ ΑΓΡΟΤΙΚΩΝ ΣΥΝΕΤΑΙΡΙΣΜΩΝ ΚΑΡΔΙΤΣΑΣ
25. ΕΝΩΣΗ ΑΓΡΟΤΙΚΩΝ ΣΥΝΕΤΑΙΡΙΣΜΩΝ ΒΟΛΟΥ
26. ΕΝΩΣΗ ΑΓΡΟΤΙΚΩΝ ΣΥΝΕΤΑΙΡΙΣΜΩΝ ΑΛΜΥΡΟΥ
27. ΕΝΩΣΗ ΑΓΡΟΤΙΚΩΝ ΣΥΝΕΤΑΙΡΙΣΜΩΝ ΠΗΛΙΟΥ - ΒΟΡΕΙΩΝ ΣΠΟΡΑΔΩΝ
28. ΕΝΩΣΗ ΑΓΡΟΤΙΚΩΝ ΣΥΝΕΤΑΙΡΙΣΜΩΝ ΤΡΙΚΑΛΩΝ
29. ΕΝΩΣΗ ΑΓΡΟΤΙΚΩΝ ΣΥΝΕΤΑΙΡΙΣΜΩΝ ΚΑΛΑΜΠΑΚΑΣ
30. ΟΜΑΣ Α.Ε. – ΣΥΜΒΟΥΛΟΣ ΥΠΟΣΤΗΡΙΞΗΣ
31. ΠΕΡΙΦΕΡΕΙΑ ΘΕΣΣΑΛΙΑΣ : ΔΙΕΥΘΥΝΣΗ ΑΝΑΠΤΥΞΙΑΚΟΥ ΠΡΟΓΡΑΜΜΑΤΙΣΜΟΥ
32. ΜΕΛΗ Ο.Σ.Π. ΘΕΣΣΑΛΙΑΣ

Appendix B List of key documents and reference materials

Υπουργείο Ανάπτυξης, Ανταγωνιστικότητας και Ναυτιλίας (2012) 1η Εγκύκλιος Σχεδιασμού και Κατάρτισης Αναπτυξιακού Προγραμματισμού 2014-2020 (1st Directive for Setting the Development Programme 2014-2020)

ΓΓΕΤ (2012) Πρόταση ΓΓΕΤ για τη Διαμόρφωση Κατευθύνσεων Αναπτυξιακής Στρατηγικής 2014-2020 (Proposal of GSRT for Defining Directions of Development Strategy 2014-2020)

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Petrakos, G. et al. (2011) 'Entrepreneurship, Innovation and Regional Development: A Southern European Perspective' In K. Kourtit, P. Nijkamp, and R.R. Stough (Eds.) 'Drivers of Innovation, Entrepreneurship and Regional Dynamics' Springer

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Regional Innovation Monitor (2012), <http://www.rim-europa.eu/index.cfm?q=p.baseline&r=GR14>

Eurostat data accessed on 1 November 2012, <http://epp.eurostat.ec.europa.eu>

Observatory for Digital Greece (2010), Internet Users in Greece. <http://www.observatory.gr>

MERIT, Technopolis (2012), Regional Innovation Scoreboard 2012, Report for the European Commission, DG Enterprise and Industry, available here: http://ec.europa.eu/enterprise/policies/innovation/files/ris-2012_en.pdf

Appendix C Key actors in the regional innovation system

Emerging Clusters/Sectors:

Farming and Animal Husbandry, Agricultural Products, Processed Food, Agro Materials, Biofuels, Metallurgical products.

Leading Businesses:

Fasmetrics, BioMar, Loulis Group, Sovel, Vemekep, Biodak Lab, Prognosis Biotech, Elin Biofuels, Euromedica Larissa, Future Technology Systems, Epsa, Vioser, Epilektos, Epikinonia, Exin, Zeyxis, Intramet, Kioleides, Metka, Bekrodimitris, Papageorgiou, Technometal, Sidenor, Temka, Trailers, Xyloependitiki, Selected Textiles, Hydroelectrica, Halyvourgia Thessalias, Brain, Linomedia, Planning, Agricultural Cooperative of Tyrnavos, and noteworthy spin-offs: K-Meditura, SEMIA, etc.

Key Research Actors:

The research fabric is composed of the University of Thessaly, the General University Hospital of Larissa, the Technological Educational Institute of Larissa, the Centre for Research and Technology Thessaly (CERETETH), the Metallurgical Industrial Research & Technology Development Centre (MIRTEC), the Hellenic Agricultural Organisation Demeter, etc.

Innovation Financing:

Cooperative Bank of Thessaly, Cooperative Bank of Karditsa

Incubators, Industrial Areas/Zones

Technology Park of Thessaly, Industrial Zones of Larissa, Karditsa, Volos (3).

Principal Intermediaries:

Association of Industries of Thessaly & Central Greece, Association of Thessalian Industries, Chambers of Larissa, Karditsa, Magnesia, Trikala, Unions of Agricultural Cooperatives of Larissa-Tyrnavos-Agia, Farsala, Ellassona, Karditsa, Volos, Almyros, Pilio-Sporades, Trikala and Kalambaka, Development Company of Magnesia, Development Agency of Karditsa, Development Agency of Prefecture of Trikala, Development Agency of Chamber Of Magnesia, Education & Training Centre of Magnesia, Regional Development Fund of Thessaly, Association of Municipalities of Larissa, Technical Chamber of Greece – Central and Western Thessaly and Magnesia, Units of Innovation and Entrepreneurship of the University of Thessaly and the Technological Educational Institute of Larissa.

Appendix D Gross value added at basic prices by sector - Thessaly

% of total Gross value added at basic prices	2005	2006	2007	2008	2009
A - Agriculture, forestry and fishing	12.52	8.22	8.04	7.72	8.75
B-E - Industry (except construction)	13.75	17.19	15.44	14.55	15.99
C - Manufacturing	12.32	15.48	13.79	12.85	14.11
F - Construction	7.92	9.29	8.42	7.86	6.82
G-I - Wholesale and retail trade, transport, accommodation and food service activities	24.25	24.59	26.16	27.75	23.54
J - Information and communication	1.56	1.78	1.56	1.17	1.33
K - Financial and insurance activities	2.88	2.77	2.59	2.34	2.54
L - Real estate activities	8.80	8.25	8.87	9.43	9.76
M_N - Professional, scientific and technical activities; administrative and support service activities	3.60	3.64	3.66	3.26	3.37
O-Q - Public administration, defence, education, human health and social work activities	20.82	19.85	21.00	21.42	23.47
R-U - Arts, entertainment and recreation; other service activities; activities of household & extra-territorial organisations and bodies	3.90	4.42	4.25	4.47	4.42
TOTAL (in million euro)	9,040.0	9,619.9	9,900.5	10,345.9	10,353.6

Source: Eurostat

Appendix E Regional RTDI funding under the OP Competitiveness and Innovation

Allocation by region of GSRT grants for RTDI projects (State Aid) under the OP Competitiveness and Innovation

Region	Enterprises	Research organisations	Other entities	Grand Total	% share
Attiki	€ 78,383,203	€ 33,291,462	€ 480,411	€ 112,155,076	47.4%
Central Macedonia	€ 22,588,727	€ 13,566,039	€ 38,300	€ 36,193,066	15.2%
Western Greece	€ 22,841,816	€ 8,901,221	€ 7,000	€ 31,750,037	13.4%
Crete	€ 3,623,524	€ 13,728,214	€ -	€ 17,351,738	7.2%
Stereia Ellada	€ 9,388,903	€ 1,397,119	€ -	€ 10,786,022	4.6%
East Macedonia & Thrace	€ 5,886,928	€ 1,864,884	€ 25,090	€ 7,776,902	3.3%
Thessaly	€ 4,648,471	€ 2,134,643	€ 253,000	€ 7,036,114	3.0%
Epirus	€ 2,403,100	€ 1,887,252	€ -	€ 4,290,352	1.8%
Peloponnese	€ 3,382,986	€ 545,200	€ -	€ 3,928,186	1.7%
Βορείου Αργαίου	€ 1,813,280	€ 425,506	€ -	€ 2,238,786	0.9%
West Macedonia	€ 1,355,665	€ 524,695	€ -	€ 1,880,360	0.8%
Ionian Islands	€ 388,000	€ 120,000	€ -	€ 508,000	0.2%
Νοτίου Αργαίου	€ 476,000	€ -	€ 18,750	€ 494,750	0.2%
Grand Total	€ 157,180,603	€ 78,386,235	€ 822,551	€ 236,389,389	100%
	66.5%	33.2%	0.3%		

Source: data received from the GRST on 10 October 2012. Calculations authors.

Appendix F Relative regional specialisation in 20 industries – Thessaly

	Industry	Rank in Europe	Specialisation	Employment
1	Manufacture of structural metal products	1	2.91	5 687
2	Manufacture of cement, lime and plaster	4	13.04	1 674
3	Maintenance and repair of office, accounting and computing machinery	4	3.48	761
4	Preparation and spinning of textile fibres	5	7.86	1 687
5	Provision of services to the community as a whole	6	3.51	13 145
6	Adult and other education	7	2.80	5 593
7	Growing of crops; market gardening; horticulture	8	11.33	52 425
8	Veterinary activities	10	2.37	655
9	Farming of animals	11	4.88	7 132
10	Repair of personal and household goods	15	2.44	926
11	Architectural and engineering activities and related technical consultancy	17	1.71	6 198
12	Processing and preserving of fruit and vegetables	17	4.28	1 825
13	Manufacture of dairy products	20	3.02	1 895
14	Secondary education	20	2.33	10 510
15	Maintenance and repair of motor vehicles	26	1.61	4 403
16	Quarrying of stone	26	3.10	549
17	Manufacture of beverages	28	2.11	1 684
18	Site preparation	32	2.08	1 786
19	Manufacture of other textiles	38	2.03	779
20	Forestry, logging and related service activities	48	2.09	1 019

Source: Smart specialisation in Europe: European specialisation data by region Centre for Strategy and Competitiveness, Stockholm School of Economics, April 2011