Strategic Evaluation on Innovation and the Knowledge Based Economy in relation to the Structural and Cohesion Funds, for the programming period 2007-2013

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Executive Summary

The general view of the Cypriot economy presents a satisfactory rate of growth, full employment conditions and a low inflation rate. A basic characteristic of the country's profile is the advanced educational level and its highly qualified working force. However, high tech manufacturing and R&D intensity remain at low levels mainly due to the low level of public and business R&D funding, the dominance of low technology, low competitiveness levels and small firms with limited involvement in innovative and R&D activities, the small size of the economy, the labour force and the domestic market, and finally the country's limited experience in innovation policies as well as the lack of innovation culture.

The service sector – in particular tourism, commercial and financial services and maritime navigation companies – is considered as the backbone of the Cypriot economy and employs 67% of the working population. However, even these dynamic sectors give small importance to innovation and R&D related investments.

However, the R&D expenditures in Cyprus have increased significantly over the past decade, performing an average annual growth rate of 12%. This trend is expected to continue with the contribution of the Structural Funds, in an effort to meet the Lisbon strategy goals. Private investments in R&D are also expected to increase if the proper incentives are offered to the enterprises.

The overall responsibilities for the coordination of the country's participation in the Community Programmes, the coordination of the development work carried out in the various Ministries, Departments, Services and Semi-Government organisations, as well as the designing of the national RTDI strategy are carried out by the Cyprus Planning Bureau. Beside the Planning Bureau, there are several ministries and departments responsible for specific aspects of the RTDI policy.

Over the current programming period, a number of problems related to the management of RTDI measures of the SF occurred, related mainly to coordination issues between the various public bodies and particularly between the Planning Bureau and those ministries directly involved with RTDI measures within the Structural Funds. This can mainly be attributed to the inexperience of these bodies since they are still adjusting to the rational of the SF. Moreover, the adjustment of the regulatory framework that took place in order to support the timely and efficient implementation of the RTDI measures also lead to further delays.

Although there is no clear policy mix assessment for innovation and knowledge, the provision of an innovation friendly environment for SMEs as well as measures supporting research are among the top priority objectives.

During the 2004-2006 period Cyprus is a recipient of the Objective 2 regional development programme funded by the ERDF. A significant percentage of these funds, amounting to 24.8%, were allocated toward RTDI interventions. However, only 0.1% of these funds have been disbursed during the first two years of Structural Fund Management. This significant delay has been indicated mainly due to the very short time period in which the country was expected to adjust its administrative procedures to the SF framework. Additionally, the framework itself has been considered to be especially demanding and procedure – complexed, creating more administrational problems.

Due to the fact that Cyprus is a recipient of SF only since 2004, it has very limited experience concerning the management of Structural Fund interventions in favour of innovation and knowledge.

It must be noted that, within 2004 which was Cyprus' first year as an official EU-25 member, the total absorption of Structural Funding was 4.7%, which is very close to the 5.8% average of the 10 new member states. Therefore the negligible disbursement of the RTDI funds within the 2004-2005 period is not characteristic of the country's overall SF management.

The main factors that could influence future innovation potential in Cyprus can be summarised in the following basic policy headlines, which are based on the country's sectoral strengths and weaknesses:

➢ Potential for further promoting the Banking and Financial Sector
➢ Potential for Tourism Services upgrading
➢ Development of rural areas through the promotion of multi functional agricultural space
➢ Development of rural areas through the exploitation of renewable energy sources
➢ Support the declining manufacturing sector by promoting technology transfer

The policy priorities for the next programming period in terms of innovation and knowledge should be focused on the increase of secondary and tertiary sector value added, as well as the targeted upgrading of human capital and production methods based on specific sectoral needs such as converging technologies in manufacturing.

According to the draft version of the NSRF and the interviewed experts, the new Framework is in line with the development needs and challenges of Cyprus and contains priority pillars with special emphasis given to innovation related measures.

The increase of public investments in research, technological development and innovation is a top priority for the next programming period. Specifically, the NSRF foresees the doubling of R&D expenditure.

The suggested basic strategic and operational orientations for Structural Fund investments in innovation and knowledge can be summarised as following:

1. Reinforcement of Innovative dynamic in Cypriot SMEs by providing incentives for competitiveness, attraction of foreign technology intensive enterprises, the creation of new technology based firms and spin-offs in selected sectors etc.

2. Incentives to young researchers and increase demand for qualified researchers

3. Increase the importance of Innovation throughout the Production Base with a combination of measures promoting secondary and tertiary sector investments in RTDI

4. Reinforce the declining rural areas by promoting alternative development paths

5. Improvement of the SF implementation results by establishing an exclusive instrument for RTDI support, guidance and funding procedures.

1   Introduction

In March 2000, the EU Heads of State and government launched an ambitious political initiative for the European Union to become "the most competitive, dynamic, knowledge-based economy by year 2010". The agenda, which has become known as the 'Lisbon Strategy', has included a broad range of policies and regulatory measures to achieve this goal.

At the 2005 Spring Council of European Union, Heads of State and government concluded that all appropriate national and Community resources, including those of Cohesion Policy, should be mobilised in order to renew the basis of Europe's competitiveness, increase its growth potential and its productivity and strengthen social cohesion, placing the main emphasis on knowledge, innovation and the optimisation of human capital. In short, the Council recognised that while some progress has been made since 2000 in moving towards the goals enshrined in the Lisbon Strategy there remains a need to create "a new partnership for growth and jobs"[1]

In launching the discussion on the priorities for the new generation of cohesion policy programmes, the Commission published on 6 July 2005 draft Community Strategic Guidelines entitled "Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013". One of the specific guideline is to improve the knowledge and innovation for growth. More specific areas of interventions, which are proposed by the Commission, include: improve and increase investment in RTD, facilitate innovation and promote entrepreneurship, promote the information society for all, and improve access to finance.[2]

Innovation is an important factor in releasing the potential of the Lisbon agenda. The knowledge captured in new technologies and processes can drive growth and competitiveness and create new jobs. But knowledge must be treated as part of a wider framework in which business grow and operate. Developing knowledge-based economy requires adequate levels of investment in R&D, education, and ICT as well as creating a favourable environment for innovation.

Less developed areas of the Union are also confronted with this new competitiveness challenge. Increasing cohesion leads to improvements in living standards and the reduction of economic and social disparities, which depend to an important extent on increases in productivity. Increasing competitiveness implies economic change through the introduction of new technologies and new methods of production as well as the development of new skills. Innovation is at the heart of this process. Technological and organisational change and new demands generated by rising income levels and factors which create new economic opportunities and therefore, contribute to the growth potential of these countries.

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[1]   Communication to the Spring European Council (2005) "Working together for growth and jobs: A new start for the Lisbon Strategy", COM(2005) 141. Available at:
http://www.europa.eu.int/growthandjobs/key/index_en.htm.

[2]   Communication from the Commission (2005) "Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013", COM(2005) 0299. Available at:
http://www.europa.eu.int/comm/regional_policy/sources/docoffic/2007/osc/index_en.htm.

Structural Funds are the main Community instruments to promote economic and social cohesion. In the past and current programmes, they have contributed to enhance the research potential and innovation in businesses and to develop the information society, particularly in the less developed areas. Cohesion policy has also promoted the development of regional innovation strategies and other similar initiatives in the field of the information society.

The overall objective of the strategic evaluation study, as set out in the terms of reference, is that the study should provide conclusions and recommendations for the future of Structural Fund and Cohesion policy. In particular, the Strategic Evaluation will be used to prepare the negotiations with the Member States for 2007-13, to prepare the next operational programmes and to provide input into the 4th Economic and Social Cohesion Report.

In line with the tender specifications, this country report addresses the following issues:

- An analysis of the current situation in the field of innovation and the knowledge-based economy at national and regional level. For the national level, performance is compared to the average performance for the EU25 Member States plus Romania and Bulgaria; and at regional level, where possible given available statistics, compared to a typology of EU regions;
- Lessons from the past and current experience of implementing innovation and knowledge economy measures in the Structural Funds, both in terms of priorities and strategic approaches; as well as in terms of operational implementation;
- Main needs and potential for innovation in the eligible regions drawing on available studies, strategy development and future and foresight studies; and
- Recommendations on main investment priorities for Structural Funds over the programming period 2007-2013 and their implications for regional development.

2 Investing in innovation and knowledge: a comparative overview of regional performance

This section provides a synthetic overview of the relative performance of the country, and where relevant main regions, with respect to the EU25 average for a number of selected key structural indicators of innovation and knowledge. The analysis aims to identify **main disparities and needs** at national, and wherever possible, regional level with a view to supporting the definition of priorities for future Structural Funds interventions (see sections 5 and 6 of this report).

2.1 Country overview: innovation and the knowledge economy

Exhibit 1 below provides a snapshot picture of the relative position of Cyprus compared to the EU-25 average for a series of key knowledge economy indicators.

Exhibit 1: Relative country performance for key knowledge economy indicators
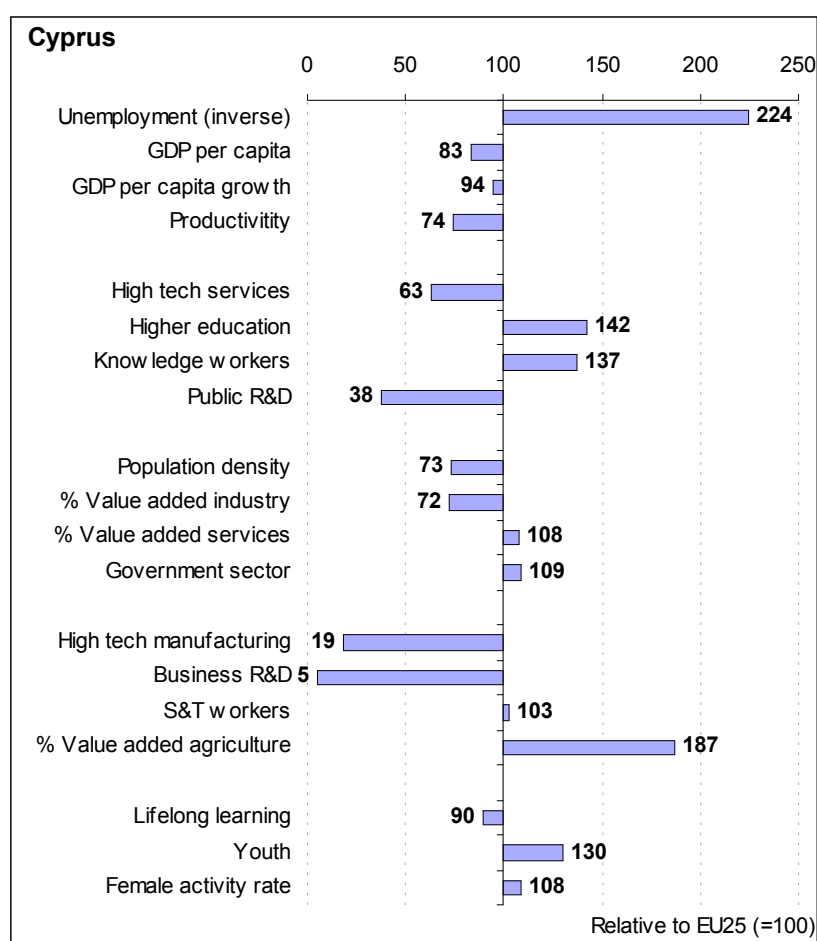
Source: The bars are stapled factor-scores showing the deviation (1=standard deviation) per factor from the average of 215 EU regions (0.00). The longer the bar, the bigger is deviation. Detailed regional scorecards can be found in Appendix B.

The general view of the Cypriot economy presents a satisfactory growth rate, full employment conditions and a low inflation rate. Cyprus has achieved a remarkable level of real convergence with EU25 economies with a per capita GDP standing at 83% of the EU average during the time period of 2002-2003. The economy is expected to grow at about 4% in the medium term, presents macroeconomic stability and retains a low inflation rate at about 2%. The real convergence of the Cypriot economy with the EU is ahead of most new EU member states.[3]

A basic characteristic of the country's profile is the advanced educational level and its highly qualified working force, respectively 142% and 137% of the EU-25 average as presented in exhibit 1. It is considered to be a high – income country in terms of GDP per capita. Living standards are high in Cyprus and per capita incomes are forecasted to expand by about 3% annually in the medium term.[4]

The relatively low labour productivity – 74% of the EU average – is mainly due to the small size of the economy, the labour force and the domestic market, which constitute an adverse factor in the realisation of economies of scale. Furthermore, the small size of the labour force, given the small population base, results in certain quantitative and qualitative imbalances in the labour market, i.e. both at the sectoral and occupational level. At the sectoral level, the imbalances are more evident in the sectors of hotels and restaurants, construction, agriculture and manufacturing, whereas at the occupational level, the shortages are observed in technical and low-skilled occupations which are mostly covered by a significant number of foreign workers, accounting for approximately 13% of the labour force.[5]

The service sector – in particular tourism, "off-shore" commercial and financial services and maritime navigation companies – is considered to be the backbone of the Cypriot economy and employs 67% of the working population.[6] However, even these dynamic sectors give little importance to innovation and R&D related investments. The continuing upward trend of the share of the tertiary sector of services in the GDP reflects the comparative advantages of Cyprus in these sectors.

Tourism and financial services dominate the Cypriot economy, accounting for more than 40% of gross value-added. Specifically, tourism contributes more than 30% of gross value-added including the secondary benefits of the sector on retailing and construction. Financial services provide partial diversification away from the tourist sector. Financial intermediation and business- related services, including parts of the banking and real – estate services, account for 23% of gross value – added. However, despite the existence of a highly developed banking system, private equity is not oriented towards innovative ventures. An important factor contributing to the competitiveness of these sectors was the favourable tax treatment of offshore companies.

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[3]   Standard & Poor's Republic of Cyprus Credit Rating Report
[4]   Standard & Poor's Republic of Cyprus Credit Rating Report
[5]   International Monetary Fund Cyprus Report 2005
[6]   http://www.innovating-regions.org

Moreover, as a consequence of its size, the economic specialisation of Cyprus[7] is restricted in a limited number of sectors. In the tertiary sector the main economic activities in which Cyprus is specialised are hotels (tourism), financial intermediation (strong banking system), community and other business services. Cyprus also appears highly specialised, in terms of value added and employment, in the construction industry, a fact which is in congruence with the extended presence of Cypriot companies in the sector particularly in the Middle East. Finally, in the primary and secondary sectors, Cyprus appears specialised in agriculture, food, non metallic minerals and furniture, i.e. sectors with low R&D intensity.

Liberalisation and restructuring, coupled with a prolonged drought, have resulted in the long-term decline of agriculture and traditional manufacturing sectors which account for an estimated 3.9% and 8.9% of gross value – added respectively. The public sector accounts for 16% of gross value – added and public sector employment is estimated at 18.5% of the total.[8]

The relatively low performance in the high tech services (see exhibit 1) and the public R&D expenditures can be partially attributed to the small size of the Cypriot enterprises (4,4 persons on average per unit in 2000), which constitutes an impediment for the adoption and development of advanced technologies and modern management methods, despite the fact that the private sector dominates the country's production. Business units are generally small and family – run. More than half of the total number of enterprises (58%) employs only one person. The large enterprises with a workforce exceeding 250 employees amounted to solely 67, representing a percentage of 0.1% of the total number of enterprises.[9]

R&D expenditures in Cyprus have increased significantly over the past decade, rising from 0.18% of the GDP in 1992 to 0.32% in 2002[10], and 0.37% in 2004. The average annual growth rate of R&D expenditure over the period 2001 to 2004 in Cyprus was 12%. This trend is expected to continue with the contribution of the Structural Funds, in an effort to meet the Lisbon strategy goals. The participation of the business sector in R&D financing remains relatively low in the country, contributing only 20% of total financing compared to EU25 average at 54%.[11] However, private investments in R&D are expected to increase if the proper incentives are offered to the enterprises.

At the same time, during 2003, public support for research activities, i.e. public funding of BERD in enterprises, was limited with only three services sectors, community services, other business activities and real estate activities. Moreover, during 2003, the services sectors accounted for 53.8% of BERD with the IT services and other business activities contributing the largest shares. Similarly in the manufacturing sector, the pharmaceuticals, food and chemicals industries account for 37% of BERD[12].

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[7]   Future data requirements of the ERAWATCH base load inventory: Feasibility study on R&D specialisation, ERAWATCH NETWORK ASBL (forthcoming), NIFU STEP, Logotech SA, SPRU, Fraunhofer ISI and Joanneum Research, 2006
[8]   Standard & Poor's Republic of Cyprus Credit Rating Report
[9]   Cyprus Strategic Development Plan 2004-2006
[10]   Cyprus Research Promotion Foundation 2004
[11]   IST-EC2 Project
[12]   Same as 7

Despite the high percentage of knowledge workers and persons possessing higher education (32,5% of the total employed population are graduates of tertiary level education)[13], only a small fragment is employed in R&D activities both in the public and private sector. This is mainly the result of low demand by enterprises for R&D collaborations and of their conservative behaviour regarding RTDI activities.

The Cypriot government, in its attempt to reverse the above mentioned negative trends, is trying to increase the demand for R&D activities by firms on one hand, and on the other hand is trying to create the appropriate infrastructures that will support these activities (for example the establishment of a polytechnic university[14], a technology park etc).

With regard to scientific specialisation[15], Cyprus presents a dual picture partly attributed to its relative small size. Thus during the period 2001-03 Cyprus was specialised in several social sciences fields such as psychology, education and social sciences, but also in a number of natural sciences such as physics, mathematics and computer sciences. In terms of technological specialisation, Cyprus during 2001-2003 was specialised in a limited number of sectors such as instruments, chemicals, petroleum and textiles. In addition, within a decade, Cyprus became under –specialised in several sectors including food, machinery, plastics, basic metals and non mineral products.

To sum up, the country has not, so far, developed significant technological or scientific competences but during the last five years there has been increasing governmental interest and effort to establish a strong science and technology system focused on certain priority areas. Health and environment are among these priorities, as well the diffusion of new technologies to the entire production system and the promotion of high-technology industries.[16]

Although Cyprus is the richest among the new member states, exhibiting the best growth competitiveness index, its relative position with respect to other structural indicators does not follow the same pace. In terms of innovation performance the country is lagging behind in many of the standard R&D indicators such as GERD, BERD and patents, as well as in the diffusion of ICT. Specifically, the Global Competitiveness Report 2004-2005 ranked Cyprus in 39th position in its technological index, due to its performances as 65th in the innovation subindex, as 54th in the technology transfer subindex and as *29th* in the ICTs subindex[17].

However, because of the high number of positive changes in trend indicators the European Innovation Scoreboards in 2003 and 2004 has classified Cyprus as a "catching up" country and highlighting the importance of "innovation diffusion" for the economy against "R&D based innovation".[18]

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[13] Cyprus Labour Force Survey - 2003
[14] Cyprus NSRF 2007-2013
[15] Same as 7
[16] European Trend Chart on Innovation, Annual Innovation Poliy Trends and Appraisal Report for Cyprus 2004-2005
[17] Centre for International Development, *Global Competitiveness Report 2004-2005*, World Economic Forum, 2005
[18] European Trend Chart on Innovation

2.2   Regional disparities and recent trends

In order to analyse and describe the knowledge economies at regional level in the EU, the approach adopted was to reduce and condense all relevant statistical information available for a majority of regions. The approach involved firstly reducing the information from a list of selected variables into a small number of factors by means of factor analysis. These factors are:

- Public Knowledge (F1): human resources in science and technology combined with public R&D expenditures and employment in knowledge intensive services is the most important or common variables in this factor. Regions with large universities will rank high on this factor.
- Urban Services (F2): The most important variables for this factor are value-added share of services, employment in government administrations and population density. A key observation is that academic centres do not necessary co-locate with administration centres.
- Private Technology (F3) This factor is most strongly influenced by business R&D, occupation in S&T activities, and employment in high- and medium-high-tech manufacturing industries.
- Learning Families (F4). The most important variable in this factor is the share of the population below the age of 10. The Learning Families factor could also be interpreted as an institutional factor indicating a child-, learning- and participation- friendly environment, or even a 'knowledge-society-life-style' based on behavioural norms and values that are beneficial to a knowledge economy.

Exhibit 2: Regional factor scores per region

Source: MERIT. The bars are stapled factor-scores showing the deviation (1=standard deviation) per factor from the average of 215 EU regions (0.00). The longer the bar, the bigger is deviation.

The "mono- region" country of Cyprus falls into the cluster group of 'learning regions'. It demonstrates good performances in the sectors of public knowledge, urban services and particularly learning families in comparison to the EU25 average. While the unemployment rate is negligible, GDP per capita growth and productivity remain well below EU average. At the same time, as in other learning regions, Cyprus is lagging in terms of private technology, with private R&D expenditures being extremely low.

Exhibit 3: recent trends per region in key indicators

	Unemployment	GDP per capita growth 1996-2002	High tech services	Higher education	Knowledge workers	Public R&D	Population density	% Value added industry	% Value added services
EU25	9,2	4,8	3,2	20,7	11,6	0,69	117	27,0	70,9
Cyprus	4,1	4,5	2,0	29,5	16,0	0,26	85	19,4	76,7

	High tech manufacturing	Business R&D	S&T workers	% Value added agriculture	Lifelong learning	Youth	Female activity rate
EU25	6,6	1,24	20,7	2,1	8,7	10,8	48,3
Cyprus	1,2	0,06	21,3	3,9	7,8	14,1	52,4

Source: MERIT based on Eurostat data for period indicated

During the past 20 years, the Cyprus economy was characterised by high growth rates with the services sectors being the main engine of growth. The differentiation in the structure of production in favour of the tertiary sectors and against the primary and secondary sectors led to regional (spatial) inequalities, with the concentration of economic development in urban and coastal areas and the degradation of rural areas.

The population density in Cyprus is below the EU average, with approximately 70% of the total population being concentrated in the urban centres. The basic characteristic of the urban areas is the predominance of the services sector, which accounts for 76.7% of the GDP and over 70% of the labour force. This fact reflects the gradual restructuring of the Cypriot economy from an exporter of minerals, agricultural products, and manufactured goods during the previous decades, to an international tourist, business and services centre.

Specifically, rural areas with the exception of some suburban communities and those that have significant competitive advantages (and attract mainly tourist development) are characterised by depopulation and ageing population trends, due to urbanisation. These developments resulted in the decrease in the share of rural population (31% of total population compared to 57% prior to the Turkish invasion). On the other hand, all major urban areas have significant comparative development advantages which have resulted in high growth rates.

Nevertheless, the main historical centres of all four Cypriot urban areas as well as traditional centres which have been incorporated in the urban web, face the complex and complicated problems of downgrading and underdevelopment that are also observed in other major European centres. An unavoidable consequence is the deterioration of the natural and man made environment in urban areas in decline, the abandonment of a number of buildings and the downgrading of public spaces. As a result the areas are progressively transformed in non-attractive ones both for the local population and the broader public.

Therefore, a primary goal of the 2004-2006 Strategic Development Plan was to promote balanced regional development by regenerating urban and rural areas in decline, and specifically[19] focusing on the:

➢ Improvement of competitiveness of the agricultural and the fisheries sectors
➢ Convergence in the level of development and income between urban and rural areas
➢ Economic and social regeneration of downgraded urban areas
➢ Strengthening of local authorities

2.3 Conclusions: innovation and knowledge performance

Cyprus is a small open economy, with the private sector dominating production. Within the private sector, services are the most dynamic economic activities and particularly the tourism, financial intermediation, business and community services. Despite the high growth rates, high income per capita and the high educational level of the workforce Cyprus still faces significant structural disadvantages compared to EU15 countries with regard to its National Innovation System.

On the one hand, the small size of enterprises inhibits the adoption of new technologies and modern management methods and also results in reduced predisposition for the development of collaborations in R&D with public research centres and universities. On the other hand, due to the small demand by enterprises and of the small size of the economy, the public research infrastructures have not aligned their priorities with the needs of the economy and have not yet developed to a larger extent their technology transfer mechanisms.

Finally, the disparities between urban, rural and coastal regions in terms of specialisation of economic activities and existence of a skilled labour force do not constitute an insurmountable problem due the proximity of these areas for policy making. Furthermore, the segmentation of the country into smaller regions would only increase the bureaucracy without contributing significantly to a more targeted regional policy[20].

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[19] Cyprus Strategic Development Plan 2004-2006
[20] This statement appears to be a common held belief among the experts interviewed in the context of the project.

Exhibit 4: summary of key disparities and needs per region

Region / group of regions	Key factors explaining disparity of performance (weaknesses)	Key needs in terms of innovation and the knowledge economy
Cyprus	• Despite the advanced educational level and the highly qualified working force, high tech manufacturing and R&D intensity remain at low levels • Low public and business R&D funding • Industry is dominated by low technology, low competitiveness and small firms with limited involvement in innovative and R&D activities • Small size of the economy, the labour force and the domestic market • Small size of enterprises with limited technology absorption capacity • Limited experience in innovation policies, lack of innovation culture • Small number of collaborations between public research institutes and firms.	• Reorient public R&D in areas of economic interest • Significantly increase public R&D spending • Provide incentives to increase firms R&D expenditure. • Further strengthening of the RTDI policy designing and implementation frameworks with the participation of a large number of stakeholders • Promotion of networking, clustering and the alignment of enterprises and research centers in international value added chains. • Promotion of Cypriot participation in international research programmes such as the 7th FP. • Support lifelong learning by taking advantage of the high educational level • Infrastructure reinforcement focused on economic needs and development of efficient technology transfer mechanisms. • Provide incentives for collaboration between the various actors of the National Innovation System. • Promote the development of new technology based firms (NTBF's) • Orient abundant private equity towards high tech and innovative ventures by creating suitable market mechanisms and reducing risk.

3 Innovation and knowledge: institutional context and policy mix at national and regional levels

Structural Fund support for innovation and knowledge is contingent on and seeks to strengthen the existing national (and/or regional) innovation system[21] in each Member State. In particular, institutional, legal and financial factors in the innovation system can limit the potential for certain types of intervention. Moreover, within the framework of the EU's "Lisbon objectives", Structural Fund interventions are expected to complement and provide added value to national (or regional) policy framework. In some Member States, Structural Fund interventions in favour of innovation and knowledge are marginal with respect to the national investment and policy effort, in others Structural Funds provide a main source of funding for such interventions. In both cases, there is a need to identify relevant national and EU policies which can have an impact on decisions on funding priorities.

3.1 Institutional and legal framework for innovation and the knowledge economy22

This section of the report appraises two broad factors that condition the potential for coordinated intervention of EU and national (regional) policies in favour of innovation and knowledge:
- The first concerns the organisational structures of public and semi-public bodies responsible for the design, implementation and monitoring of innovation and knowledge economy policies. In particular, the analysis considers the responsibilities for funding or managing specific types of measures liable to be considered for support under the Structural Funds;
- The second concerns the institutional, legal and financial frameworks, which condition the linkage of national (regional) financing with EU financing.

Up until the early 90's, the level of RDTI activities in Cyprus was rather low. In order to reverse this condition, the government established a series of institutions and policy measures to reduce the gap with the EU average. The results of these measures are yet to be seen.

No single entity is formally responsible for the design, implementation and co-ordination of innovation policy measures. But, by its central position, the ***Planning Bureau*** could play this role. The overall responsibilities for the coordination of the country's participation in the Community Programmes, the coordination of the development work carried out in the various Ministries, Departments, Services and Semi-Government organisations, as well as the designing of the national RTDI strategy are carried out by the Cyprus Planning Bureau.

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[21] The network of organisations, individuals and institutions, located within or active within national or regional boundaries, that determine and shape the generation, diffusion and use of technology and other knowledge, which, in turn, explain the pattern, pace and rate of innovation and the economic success of innovation.

[22] European Trend Chart on Innovation Annual Innovation Policy Trends and Appraisal Report Cyprus 2004-2005

Beside the Planning Bureau, there are several ministries and departments responsible for specific aspects of the RTDI policy.

The **Ministry of Commerce, Industry and Tourism** is responsible for issues related to technological development. The main axis of its operations gravitate around the New Industrial Policy focusing on the promotion of high technology industries in Cyprus through the establishment of an incubator and the creation of a Centre for carrying out applied research and development in high technology fields.

It appoints the members of the **Technical Committee for the Promotion of High-Tech Industry**, composed of representatives of the Ministry of Industry, the Planning Bureau, the University of Cyprus, the Chamber of Commerce, employer's association, the *Cyprus Institute of Technology (CIT)* and the *Research Promotion Foundation (RPF)*. This technical Committee focuses on the promotion of high-tech activities (software, biotechnology, energy, electronics etc) and on attracting Foreign Direct Investments.

Although not directly involved in innovation policy design and with no specific strategy the **Ministry of Education and Culture** contributes to the RTDI efforts of Cyprus through the General University Funds (GUF's).

The **Ministry of Labour and Social Insurance** is the main state agency responsible for life – long learning and training through its apposite organs, among which is the Human Resource Development Authority[23] .

At the moment, there is no body in charge of providing advice, medium-long-term vision and foresight to the Government. However, an Advisory Programming Committee is forecasted to be established during the next programming period.

The *Research Promotion Foundation (**RPF**)* was established in order to promote the development of scientific and technological research in Cyprus. The Foundation is an independent organization directly funded by the Planning Bureau. The Foundation's core objective is the promotion of scientific and technological research in Cyprus. RPF has also developed several activities to facilitate the creation of networks between Cypriot and foreign scientists.[24] The RPF provides funding through call for proposals targeting research and technology organisations of both the public and private sector.

The Cyprus Institute of Technology *(CIT)* was established in 1992 as a joint effort of the Ministry of Commerce, Industry & Tourism, the Cyprus Chamber of Commerce & Industry and the Employers & Industrialists Federation. The Institute is registered as an independent, non-profit organization. The CIT manages subsidy programmes targeted to companies and focusing on the technological upgrading of all sectors (subsidy for consultancy services, using and diffusing ICT, quality control and standards, etc.).

The participation of the private sector in policy planning is somewhat limited, which is mainly due to the centralised character of the Cypriot public sector. Additionally, besides the country's high level of development and the long tradition in banking activities, it lacks products and mechanisms for the support of new enterprises and entrepreneurial activities of

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23   http://www.mlsi.gov.cy
24   http://www.research.org.cy

innovative character. The high-tech ventures so far developed in the business incubators are forced to seek for appropriate funding abroad.

In addition, a few financial instruments also target the promotion of entrepreneurship. More specifically, throughout the government guarantee scheme (CY_12) loans are granted by the commercial banks to encourage financing of SMEs. In addition, the SME centre of the Cyprus Development bank provides integrated solutions to SMEs (via loans, equity and quasi-equity instruments). However, despite the significance of these schemes, the mobilisation of the banking system of the country is not considered sufficient particularly for funding innovative ventures.

Exhibit 5: Main organisations per policy area.

Policy objectives	National (&/or regional) public authorities and agencies	Key private or non-profit organisations
Improving governance of innovation and knowledge policies	• Ministry of Commerce, Industry & Tourism • Planning Bureau	• Universities • Consulting Firms
Innovation friendly environment	• Ministry of Commerce, Industry & Tourism • Cyprus Productivity Centre	• Guarantee Fund • Cyprus Development bank
Knowledge transfer and technology diffusion to enterprises	• Ministry of Commerce, Industry & Tourism	• Cyprus Institute of Technology
Innovation poles and clusters	• Ministry of Commerce, Industry & Tourism	• Universities • Financial Institutions
Support to creation and growth of innovative enterprises	• Ministry of Commerce, Industry & Tourism • Planning Bureau	• Cyprus Institute of Technology
Boosting applied research and product development	• Ministry of Commerce, Industry & Tourism	• Research Promotion Foundation

Source: study team based on national/regional policy documents, TrendChart reports, OECD reports, etc.. See appendix C for a detailed definition of the policy categories.

Over the current programming period, a number of problems related to the management of RTDI measures of the SF occurred, related mainly to coordination issues between the various public bodies and particularly between the Planning Bureau and those ministries directly involved with RTDI measures within the Structural Funds. This can mainly be attributed to the inexperience of these bodies since they are still adjusting to the rational of the SF. Moreover, the adjustment of the regulatory framework that took place in order to support the timely and efficient implementation of the RTDI measures also lead to further delays.

Exhibit 6: Policy mix for innovation and knowledge

Policy objectives	Target of policy action		
	Academic /non-profit knowledge institutions	Intermediaries/bridging organisations	Private enterprises
Improving governance of innovation and knowledge policies	• Bilateral cooperation with EU and non EU countries		Awareness Campaign for the importance of RTDI
Innovation friendly environment	• Patent Law • Familiarisation of students with research • Programme for Integration, support and mobility: PENEK	• Guarantees for Loans to SMEs • Networks of business Angels	• Patent Law • EVRESITEHNIA-Safeguarding IPR and Patent registration • Programme for Integration, support and mobility: PENEK • MENTOR = Provision of long term Consultation to SME's • DIDACTOR-PhD Degrees in Cooperation with enterprises.
Knowledge transfer and technology diffusion to enterprises			• Scheme for the subsidisation of studies and software development. • State Grants for upgrading technology • Thematic networks • Research and technology mediation system • Innovation networks
Innovation poles and clusters	-	• High technology business incubators	-
Support to creation and growth of innovative enterprises		• Technology park. • High technology business incubators	• Business Development Programme designed for owner-managers of SMEs • Support to female entrepreneurship supports start-ups • Loans to SMEs • Awareness – Training of SME's for the development and exploitation of Innovation Opportunities.
Boosting applied research and product development	• Measures to develop and support research (6°FP) • Strengthening the Laboratory infrastructure in Cyprus • Programme for support of the research infrastructure, enhancement of the existing infrastructure, networks • Research funding for new product development (EUREKA)		• Research in Enterprises and Collaboration with Public Research Organisations • Programme for support of the research, infrastructure, enhancement of the existing infrastructure, networks • Research funding for new product development (EUREKA)

Legend

Top policy priority	Secondary priority	Low priority

Source: calculations of study team based on national/regional policy documents, TrendChart reports, OECD reports, etc.

3.2 Policy mix assessment

This section provides a summary overview and analysis of the national and regional policy mix in favour of innovation and knowledge in which the Structural Fund interventions take place. The analysis is conducted with respect to seven broad categories of objectives of innovation and knowledge policies (see appendix C for an explanation of each category).

Measures identified per category of policy objectives are then further sub-divided in terms of the direct beneficiaries of funding (or legislative) action. To simplify, the report adopts three broad types of organisation as targets of policy intervention:

- Policies supporting academic and non-profit knowledge creating institutions;
- Policies supporting intermediary/bridging organisations involved in innovation support, technology transfer, innovation finance, etc.;
- Policies supporting directly innovation activities in private sector.

The matrix on the opposite page summarises the current policy mix at national level. The intensity of support (financial or political priority) for different policy areas and targets is indicated by a colour coding system.

Improving governance of innovation and knowledge policies

The policy objective within this policy area was to create a coherent policy framework for research and innovation, although innovation policy objectives as such are expressed only as a second priority of the Strategic Development Plan 2004-2006. The main measures taken in order to partially meet the abovementioned needs were the design of the Advisory Programming Committee (composed of all organisations involved in the development of the country), which will be operational for the coming programming period and the establishment of bilateral cooperations with policy makers from EU and non-EU countries. In addition, through the Framework Programme which was launched in 2003 via the Research Promotion Foundation, special actions are being implemented to address the specific needs. E-foresee is the only type of foresight activity undertaken in Cyprus.

Despite the increased financial resources, the national innovation governance system is still of low importance in Cyprus. The absence of a coordination mechanism and the limited experience of the consultation mechanism are reflected in the absence of a clear and coherent innovation policy framework. In addition there is lack of participation of private and intermediaries stakeholders in this specific policy objective.

Innovation friendly environment

The main objectives in this policy area are the creation of a new environment for innovation through the modernisation and enhancement of the research infrastructures, the strengthening of the research framework in terms of regulations and the encouragement of the private sector to participate in innovative activities and transnational learning practices. This policy area is being met through several measures such as supporting the protection of intellectual property, providing grants and loans to SMEs to upgrade their technology base through the development of a guarantee fund, and financing and improving enterprises' competitiveness through the development of their human resources. Moreover, three measures from the Ministry of Commerce Industry and Tourism (namely CY_6 "Mergers",

CY_7 "Joint-Ventures", CY_8 "Subcontracting") are addressing the improvement of innovation friendly environment, through the

- Provision of incentives in the form of government grants and tax relieves to existing manufacturing units, to cover part of the expenditure which their mergers entail.
- Provision of government grants and tax reliefs to existing manufacturing industries in order to cover part of the expenses in the context of joint-ventures for existing units.
- Provision of incentives in the form of government grants to existing manufacturing industries to cover part of the expenditure required for their restructuring so as to be able to undertake work from local or foreign companies as subcontractors.

Overall, the innovation friendly environment is sufficiently addressed. The beneficiaries of the large number of measures are both the public sector and intermediary organisations and mainly enterprises.

Knowledge transfer and technology diffusion to enterprises

This is a policy area where all measures are addressed enterprises, while intermediary and public research organisations are not directly targeted. The main policy objective was to provide direct support in order to improve the competitiveness of enterprises. This support was delivered to the companies via several measures including the promotion of product and service development, and the facilitation of the transfer and diffusion of knowledge to enterprises. Despite the relatively high political support to promote technology transfer in enterprises one of the major challenges of the national innovation system in this area is not addressed at all. Thus there is no provision for the development of technology transfer mechanisms within public research organisations and universities limiting in this way the effectiveness of the entire policy area.

Innovation poles and clusters

There is no specific cluster policy in the national innovation governance system mainly due to the fragmented economy and the limited sectoral concentration. However, during 2006 the Cypriot government is planning to launch a program regarding thematic networks[25]. This will involve collaboration between enterprises, research organisations and intermediary bodies. It is estimated that 10 thematic networks will be created by 2011. The duration of these networks will be three to five years. In addition during 2002, the Ministry of Commerce, Industry and Tourism launched a programme for the creation of 'High Technology Business Incubators'. Four incubators have already been set up that host new innovative enterprises funded according to *de minimis* rule. The main objective of this programme was the creation and development of innovation poles that would increase industry-science collaborations, with the incubators playing a pivotal role.

Support to creation and growth of innovative enterprises

The most important measures to support the innovative enterprises were funding for the establishment of incubators, financial support to SMEs (grants, loans) and for innovative start-ups. At the same time, the development of a technology park (CY_43-ongoing) and of High tech business incubators (CY_5) is expected to provide indirect support to new technology based firms. Despite these measures, there is no significant growth of innovative

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[25] Annual Innovation Policy Trends and Appraisal report, European Trend Chart on Innovation April 2006

enterprises as this is not part of a robust innovative policy combined with the lack of innovation culture in the entire innovation system.

Boosting applied research and product development

R&D expenditure in Cyprus as a percentage of GDP remains the lowest in the EU (0.33%) and lags behind the Lisbon targets. The implemented measures in order to support this policy objective (through supporting research infrastructure and the effective exploitation of research results, the EUREKA project and the funding of collaborative research) are comparably few and of low effectiveness. This is particularly so in the case of enterprises where R&D expenditure are marginal. No important measures have been taken in order to increase research expenditure of enterprises.

To sum up, the policy mix can be regarded at first sight as satisfactory with provisions for all six policy areas, particularly for enterprises and secondarily for public research organisations. The least addressed policy area (as in other countries like Greece, Bulgaria etc) appears to be the '*Improving governance of innovation and knowledge policies*' which is addressed by only two measures. The policy area '*Innovation poles and clusters*' appears also to be of low priority since it is addressed partially by only one measure. Finally the other four policy areas are addressed by several measures, particularly with regard to enterprises and public research organisations.

What is striking however in these policy areas is the lack of support for intermediary organisations, such as liaison offices and technology transfer offices that could bring together the public and private sectors.

Overall, despite the plethora of measures targeting the weaknesses of the National Innovation System, the policy mix appears to be without a coherent focus and the approach is rather fragmented than systemic.

3.3   Conclusions: the national innovation system and policy mix

The main challenges that the Cypriot Innovation System faces today is the limited expenditures for R&D mainly by firms, but also by the public research sector (universities and research organisations). Moreover, the collaboration between the above actors is limited, ad –hoc through programmes and without a long run perspective. At the same time, at the governance level there is limited consultation with the beneficiaries of the above measures and no clear long –term strategy for RTDI issues.

Similarly, limited attention is paid in the area of innovation poles and clusters. Thus the need to promote collaborations between firms and other actors, and SME's in order to consolidate their strengths and to limit the negative impacts on their competitiveness resulting from the size. The main opportunities presented for the Cypriot NIS in relation to the structural funds, but also the constraints and bottlenecks that limit the effectiveness of these funds are presented Exhibit 7.

Exhibit 7: Key opportunities and constraints for investment by the Structural Funds

Policy objectives	Opportunities for Community funding (national priorities)	Constraints or bottlenecks (factors limiting Community funding)
Improving governance of innovation and knowledge policies	• Creation of a separate body (i.e. a secretariat under the supervision of the Ministry of Commerce, Industry & Tourism who will address innovation policy directly. • Exploitation of the RIS findings. • Development of a permanent structure with the participation of a broad set of stakeholders, that will monitor developments in priority sectors.	• Lack of a national strategy for innovation. • Red tape constraints resulting in delays in policy design and implementation despite the limited number of actors involved in these procedures. • Small involvement of stakeholders in policy formulation.
Innovation friendly environment	• Creation of an Investment Guarantee Fund for SMEs. • Promotion of the e-Government in order to increase the efficiency in transactions with citizens and firms. • Build/develop entrepreneur friendly attitudes in schools and universities. • Direct the abundant and efficient financial sector towards funding innovative ventures, through the provision of incentives and the reduction of risk.	• Lack of innovation culture. • Bureaucratic problems.
Knowledge transfer and technology diffusion to enterprises	• Enhance technology transfer infrastructure and mechanisms. • Creation of support structures for the provision of specific aid to SMEs. • Provision of incentives to intermediary organisations and firms to establish long term collaborations • Increase the pool of professionals in the area of technology transfer who can offer legislative (IPR) and technical advices to researchers and firms	• Absence of technology transfer mechanisms. • Poor SME management capabilities. • Small performance and low hierarchy of RTDI among the priorities of firms. • Weak links between research and the productive sectors.'
Innovation poles and clusters	• Creation of Technology Park • Upgrading the role of incubators. • Development of clusters or innovation poles in selected economic sectors with particular focus in SME's	• Innovation poles are not among the political priorities of Cyprus. • Poor demand from the firms. • Low level of cooperation within the actors of the National Innovation System.
Support to creation and growth of innovative enterprises	• Promotion of aid schemes for the creation of spin – offs. • Incentives to private sector to participate in research activities. • Attraction of new researchers to enterprises (via aid schemes).	• Small performance and low hierarchy of RTDI among the priorities of firms. • Small relation between research and the productive sectors. • Absence of innovative culture.

Policy objectives	Opportunities for Community funding (national priorities)	Constraints or bottlenecks (factors limiting Community funding)
Boosting applied research and product development	• Reinforcement of the research infrastructure in universities and public research centers. • Creation of research infrastructure networks in specific priorities sectors (health, environment, and energy).	• Small performance and low hierarchy of RTDI among the priorities of firms. • Universities and research centres are not addressing the real needs of the Cypriot economy.

4 Structural Funds interventions to boost innovation and create a knowledge economy: 2000-2006

This section of the report provides an analysis of the patterns of Structural Fund expenditures in the fields of innovation and knowledge-based economy during the current programming period 2004-2006. It examines the patterns from both a strategic point of view (the policy mix pursued by the Structural Funds programmes) and at an operational level (consumption of funds, management of innovation measures, indications of relative effectiveness of measures, case studies of 'good' practice).

4.1 Strategic framework for Structural Fund support to innovation and knowledge

4.1.1 Strategic approach to innovation & knowledge in Structural Fund programmes

During the 2004-2006 period Cyprus was a recipient of the Objective 2 regional development programme funded by ERDF, which consists of 3 priority action lines and 6 measures. Additionally, the country receives support from 7 measures (under 3 priority action lines) in Objective 3 for education, training and employment funded by the ESF.

The Strategic Development Plan 2004-2006 set the following priorities for the country's innovation system:

> ➢ Further strengthening the framework for the support of research activities.
> ➢ Modernising and enhancing the research infrastructure.
> ➢ Encouragement and promotion of the participation of the private sector in research activities.
> ➢ Promotion of co-operation and networking of Cypriot research organisations with foreign bodies, primarily by taking opportunities offered by the European Research Programmes and particularly by the 6th Framework Programme of the EU.
> ➢ Development and commercial utilisation of existing research results or results that will emerge from new research projects and the promotion of technology transfer.
> ➢ Better use of the opportunities offered by the information society.[26]

The contribution of the Structural Funds RTDI measures to the above policy objectives can be regarded as marginal. Furthermore it appears that there is no robust alignment and coordination of the SF measures with any policy area described within the framework of the Strategic Development Plan. In contrast, SF RTDI measures focus mainly on technology transfer to SME's (Measure 1.1), to the development of business support infrastructures and provision of consultative services to firms. Thus the contribution towards R&D and utilisation of research results of the SF can be characterised as negligible.

In addition, no specific interaction between Structural Funds and RISC could be reported, (although both the Strategic Development Plan and the RISC were prepared during the same time period, i.e. early 2004). It is promising though, that the RISC strategic priorities were taken under consideration for the National Strategic Reference Framework for the next programming period

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[26]   European Trend Chart on Innovation

The calculations presented in the exhibit below are based on the EU intervention code classification. For practical purposes, the calculation of financial resources allocated to innovation and knowledge should have been limited to the RTDI codes:

- 181 Research projects based in universities and research institutes
- 182 Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes
- 183 RTDI Infrastructure
- 184 Training for researchers

But, in the case of Cyprus, there has been no funding foreseen in the above mentioned four fields of core RTDI intervention. Therefore, EU intervention codes have been widened to the following three RTDI codes:

- 162 Environment-friendly technologies, clean and economical energy technologies (only for SMEs)
- 163 Business advisory services (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology) (only for SMEs)
- 164 Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)

These fields of intervention represent innovative activities within the "broader" definition of RTDI, which has been the case in Cyprus. The respective disposed funds presented in Exhibit 8 indicate that the planned RTDI funds within the Structural Funds amount to 24.8% of the total funding. Despite the fact that the share of RTDI measures in Structural Funds is high, it amounts only to a fraction of the total R&D expenditure in the country which during 2004 was approximately 46 MEUR, i.e. 0.37% of the national GDP.

Exhibit 8: Overall allocation of resources at an objective 2 level (planned figures in Euro)

Objective	Total cost	SF			NF	
		Total	ERDF	ESF	Public	Private
RTDI INTERVENTIONS						
Objective 2	14.583.000,32	6.762.068,16	6.762.068,16	0,00	7.820.932,16	0,00
TOTAL COHESION POLICY						
Objective 2	58.692.774,00	28.022.807,00	28.022.807,00	0,00	30.669.967,00	0,00

Source: programming documents and financial data provided by DG REGIO

4.1.2 Specific measures in favour of innovation and knowledge

The entire amount of RTDI funding in Cyprus through Structural Funds is directed toward the Business Sector, and specifically to assisting the SMEs and the craft sector. The strategy of this field of intervention diffuses grants in two main directions: initial investment or modernisation of existing businesses, and general business support services. In most cases however, technological breakthroughs or investments directly related to innovation are not a prerequisite in the overall business planning for the final recipients to receive financing. Most investments aim at productivity improvement and production capacity increase through investing in equipment.

Exhibit 9: Key innovation & knowledge measures

Policy area	Number of identified measures (all programmes)	Approximate share of total funding for innovation & knowledge measures	Types of measures funded (possibly indicating importance)
Innovation friendly environment	1	16.5%	Measure 1.2 Obj.2: Business support infrastructure
Knowledge transfer and technology diffusion to enterprises	1	66.0%	Measure 1.1 Obj.2: aid to investment and business support services for SMES in the manufacturing sector
Support to creation and growth of innovative enterprises	1	17.5%	Measure 2.1 Obj. 2: facilitation of entrepreneurship and innovation – development of incubators

The policy area that concentrates the greater share of RTDI funding at a percentage of 66% is **Knowledge Transfer and Technology Diffusion to Enterprises**. The strategy underlining this policy area regards the diversification of the economic base by providing direct financial support to new economic activities, more resistant to external competitive pressures and with higher value added. The eligible investments are in fixed assets as well as business support in technology diffusion and knowledge transfer. The specific objectives of technology diffusion and knowledge transfer within this policy area focus on the introduction or adjustment of environmentally friendly technologies in the production procedures, and the use of energy saving systems or alternative energy sources.

Support to Creation and Growth of Innovative Enterprises represents a percentage of 17.5% of the total RTDI budget. The support offered to SMEs is indirect, and involves the creation of certain shared business services such as business estates, incubator units, networking etc. The overall goal is to promote development and competitiveness in ascending sectors - which in the case of Cyprus are services – through the establishment of shared business services and business advisory services.

Finally, promotion of **Innovation Friendly Environment** represents 16.5% of the RTDI budget. Its purpose is to provide advisory services to enterprises through infrastructures and institutions facilitating the development of a better entrepreneurial environment.

The overall picture obtained from the country's innovation policy and the implemented measures in the respective areas can be characterised as relatively poor. The measures concentrate on providing advisory services and fixed asset funding to SMEs and are coherent with the national policy framework and the strategic objectives of the Strategic Development Plan. However, it should be mentioned that there is a complete lack of measures for policy areas such as industrial research funding, spin-off financing, development of technology parks, innovation poles and clusters. This contribution to the country's policy mix is not promising in improving the country's performance in high-tech services. It is rather sustaining the "small firm with limited innovative activity" status than inducing the radical technological and scientific competency of the country. Furthermore, even though total R&D expenditures have been increasing over the past years, the opportunities offered through the Structural Funds have not been fully utilised.

4.2 Learning from experience: the Structural Funds and innovation since 2000

4.2.1 Management and coordination of innovation & knowledge measures

This section reviews the overall management of Structural Fund interventions in favour of innovation and knowledge during the current period. It examines the coherence, the role of key organisations or partnerships in implementing Structural Fund measures for innovation and knowledge, the linkages between Structural Fund interventions and other Community policies (e.g. the RTD Framework Programme) and the financial absorption and additionality of the funds allocated to innovation and knowledge.

The total amount disbursed from Structural Funds for RTDI actions was a mere 8.500 Euros, while for pure RTDI was zero. So far, estimates based on the current rate of absorption create doubts as to whether Cyprus will manage to absorb the allocated expenditure for RTDI by the end of 2007 or early 2008.

Due to the fact that Cyprus is a recipient of SF only since 2004, it has very limited experience concerning the management of Structural Fund interventions in favour of innovation and knowledge.

The 2004 – 2006 policy design process has been based on the past experience such as the Framework Programme for Research and Technological Development 2003-2005 managed by RPF's executives, cooperation with foreign pear organizations and the outcome of consultations with economic and political stakeholders which the RPF frequently initiates.

However, in practice there were extended deviations from best practices from the RPF framework programme, which achieved most of its initial targets, and the SF measures that tried to introduce significant novelties. These novelties were an additional factor contributing to the low absorption rates exhibited so far.

Moreover, there have been a number of synergies with other Community programmes (EUREKA, EUMEDIS, INTAS etc) that were mainly the result of "top – down" efforts driven by the RPF. Since the implementation of the 2004-2006 Strategic Development Plan, the innovation governance system continues to follow a "top – down" approach with no significant stimulus from the business and research sectors.

Responsible for the management of EU structural funding is the CSF managing authority, which is under the Planning Bureau. CSF authority is responsible for the financial coordination and monitoring of measures. The Ministry of Interior through its Department of Town Planning and Housing is the main implementing authority, whereas policy evaluations are only foreseen through the rules of EU Structural Funds

During the first two years of Structural Fund Management, the absorption capacity of the RTDI measures has been significantly low, as only 0.1% of the total allocated budget has been disbursed, as shown in the following table:

Exhibit 10: absorption capacity of innovation & knowledge measures

Objectives	Allocated SF	Disbursed total SF	Expenditure capacity
Objective 2	6.762.068,16	8.500,51	0,1%

Provided by ISMERI

It must be noted that, within 2004 which was Cyprus' first year as an official EU-25 member, the total absorption of Structural Funding was 4.7%, which is very close to the 5.8% average of the 10 new member states[27]. Therefore the negligible disbursement of the RTDI funds within the 2004-2005 period is not characteristic of the country's overall SF performance. Moreover, it appears that there is little interest this far for economic measures and the focus is more on infrastructures and the corresponding measures targeting these needs.

The main reasons for this selective delay observed in RTDI measures is related to the prolonged selection procedures related to the management of the programmes and the low initial demand by beneficiaries and particularly by SME's. This is mainly the result of the managerial problems that these firms face since most of them are family owned with conservative strategies and no professional management, struggling to solve day to day problems.

Moreover this significant delay has been also attributed to the very short time period in which the country was expected to adjust its administrative procedures to the SF framework. Additionally, the framework itself has been considered to be especially demanding and procedure – complexed, creating more administrational problems. The selection procedure for projects is carried out with the involvement of several departments, a fact that impedes the efficiency of their management procedures.

Exhibit 10a: absorption capacity of RTDI interventions

Codes	Allocated SF	Disbursed total SF	Expenditure capacity
Objective 2			
162 - Environment-friendly technologies, clean and economical energy technologies (only for SMEs)	1.419.066,60	4.250,26	0,3%
163 - Business advisory services (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology) (only for SMEs)	3.997.368,44	4.250,26	0,1%
164 - Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)	1.345.633,12	0,00	0,0%
TOTAL OBJECTIVE 2	**6.762.068,16**	**8.500,51**	**0,1%**

Thus, there is an obvious risk that the Structural Fund measures that include innovation and knowledge (even in the broad sense) will not disburse a significant percentage by the end of the planning period. In order to speed up the implementation process, the governance system should maintain a simpler structure based on past experience (as in the case with

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[27] http://europa.eu.int/comm/regional_policy/newsroom/newslet134/134_05_el.pdf

RPF), speed up the selection procedures and provide sufficient information to beneficiaries. Specifically, the management system or implementation framework that has been introduced to handle the SF specifically needs to be framed in a sharp and concise way.

4.2.2 Effects and added value of Structural Fund support for innovation and knowledge

This section of the report analyses the effects and added value of the Structural Fund interventions in favour of innovation and knowledge during the current programming period. The analysis is based on two main sources, namely: a) available evaluation reports or studies concerning Structural Fund interventions; and b) interviews and additional research carried out for this study. Accordingly, this section does not pretend to provide an exhaustive overview of the effects or added value[28] of Structural Fund interventions but rather is based on the examination of a limited number of cases of good practice.

An official evaluation of the results and impact of the RTDI measures has not yet been conducted; however the current disbursement indicators are rather discouraging. With the absorption of the allocated funds being close to zero at the end of the second year of the 2004-2006 SDP, the results of SF interventions on innovation and knowledge economy performance have not yet achieved the expected impact. Even though the county's general expenditures for R&D are rising on an annual level, it is safe to say that SF RTDI measures did not contribute toward this direction. Therefore, for the time being there are no cases of good practice to be displayed.

Over the current programming period, certain problems related to institutional, legal and financial framework created impediments for the implementation of RTDI policies and have led to the low absorption of the allocated RTDI resources. Much of this delay can be attributed to the difficulties concerning coordination processes within the organisations responsible for the implementation and the shortage of experienced personnel.

Delays and low absorption of Community Funds can also be attributed to the insufficient flow of information within the various public bodies, and the general inflexibility of governmental mechanisms. The optimum use of the Community Funds requires certain adjustments, among which are the reduction of bureaucracy and the specialised training of the opposite management and operational staff.

To sum up there appears to be little correlation between the national policy on innovation and research as expressed in the Strategic development plan 2004-2006 and the structural funds interventions. The selection of instruments is also 'conservative', such as in the case of subsidies for technology acquisition by companies or soft actions such as the provision of consultative services to firms. Such measures do not significantly add value to the National Innovation System of Cyprus since they do not confront the major challenges that it faces. For example, there are no measures in the Structural Funds supporting collaborations between the various actors of the system, the reorientation of public R&D in areas of economic interest and the promotion of networking and clustering.

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[28] A good definition is "The economic and non-economic benefit derived from conducting interventions at the Community level rather than at the regional and/or national level". See Evaluation of the Added Value and Costs of the European Structural Funds in the UK. December 2003. (Available at : www.dti.gov.uk/europe/structural.html)

4.3 Conclusions: Structural Funds interventions in favour of innovation and knowledge

As the experience of the implementation from other countries recipient of SF, most beneficiaries and managing authorities are familiar with traditional instruments such as direct subsidies for the acquisition of technologies by firms and soft actions related to the provision of consultative services particularly to SME's. Thus, these measures are expected to present the highest absorption rates in the current programming period. However, there is a need for better alignment of National Policy objectives and the Structural Funds interventions in the area of RTDI.

At the same time, the responsibilities for the implementation of the different parts of innovation policy are held by a small number of policy actors, while the relatively simple structures of the governance system allow for the horizontal coordination of actors through less formal procedures, partnerships or consultations. This simple structure and the existence of informal communications can act as a catalyst for achieving better coordination Finally, concerning the impact of RTDI measures of the structural funds on the national Innovation System no concrete conclusions can be drawn since all three relevant measures are either at an early stage of implementation or have not started yet. However, the expected outcomes of the abovementioned measures are summarized in exhibit 11.

Exhibit 11: Main outcomes of innovation and knowledge measures

Programme or measure	Capability	Added value
Measure 1.1 Obj.2: aid to investment and business support services for SMEs in the manufacturing sector	Limited absorption	Increasing R&D spending in the private sector and especially in the SMEs. Facilitating collaboration with public research sector
Measure 1.2 Obj.2: Business support infrastructure	Limited absorption	Enhancing the participation of the private sector, promotion of networking. In line with SDP priorities
Measure 2.1 Obj 2: facilitation of entrepreneurship and innovation – development of incubators	No absorption	Enhancing the participation of the private sector in R&D activities, promotion of networking. In line with SDP and national priorities

Efficiency: significant results achieved; good absorption and management performance, etc.

Added value of measures → reinforcement of national priorities, innovative approaches and solutions, institution building, etc.

5 Regional potential for innovation: a prospective analysis

This section of the report seeks to summarise and draw conclusions from the analysis of the preceding sections, available studies and interviews and focus groups carried out for this study in order to provide an analysis of the regional innovation potential. In doing so, the aim is to provide a framework for orientations in terms of future Structural Fund investments in innovation and knowledge.

5.1 Factors influencing regional innovation potential

The most dynamic sectors fuelling growth are tourism, finance, shipping, real estate and business services, with the entire service sector being a major contributor. Other specific sectors that are under a "catching up" process technology-wise, are high-tech services, health services and education.

Even though Cyprus is a mono-regional country, its economic growth has not been regionally balanced. The economic growth has been mainly concentrated in the urban centres – especially Nicosia- and some of the coastal regions with developed tourism infrastructure. However, according to the interviewed experts, the segmentation of the country into smaller regions would be considered to be completely unnecessary and would only pile up on the existing bureaucratic mechanism. The implementation of horizontal measures can adequately contribute to the promotion of innovation potentials in all the areas of the country.

The manufacturing sector has been declining during the past couple of decades, mostly in favour of the services sector. The noticeable lack of infrastructure, the very small size of local enterprises and the severe competition pressures occurring from low cost countries represent serious threats for the Cypriot manufacturing future. However, the introduction and proper promotion of an "innovation culture" throughout the production base could create the opportunity for traditional enterprises to fully or partially adopt converging technologies in order to stand up to the global competition.

Certain manufacturing sectors already exhibit optimistic potentials, such as pharmaceuticals, metal products, paper products, publishing and printing activities, electrical machinery and equipment.

The agricultural sector is also exhibiting a downward course, again mostly in favour of the services sector. The vast unexploited rural areas in combination with the cultivation-friendly climate, could present a very good growth opportunity basis if accompanied by the introduction of innovative cultivation methods, or even the development of multi-functional agricultural areas such as agro-tourism enterprises.

The opportunities regarding the further upgrading of the tourism sector via the introduction of innovative services and new approaches to logistics (though ICT related technologies) and infrastructure investments seem to be the only option in order to maintain the sector's leading position in the country's economy. The quality of services provided in the tourism sector need further enhancement both in terms of basic and technological infrastructure. The adoption or creation of innovative tourism services and recreational activities could have significant impacts for the development of both urban and rural areas.

The financial services and banking sector is especially dynamic with potential for even further development and particularly for supporting innovative ventures. The relatively advanced ICT sector significantly supports the upgrading of the financial services. Furthermore, the anticipated monetary accession of Cyprus to the EU creates additional opportunities through the unhindered access of financial services to the EU market.

The country's energy sector is considered to be sufficient in terms of meeting electricity demand, however it is heavily dependent on imported oil and petroleum products with domestic renewable energy sources covering a mere 4% of the overall needs. The energy sector has great growth potential, considering Cyprus' abundance of renewable energy resources. Public and private investments in R&D in the field of environmentally friendly technologies and energy management could produce great benefits for the Cypriot economy, while the prolonging of the country's dependence on petroleum products could become a significant threat.

Finally, the health related services are constantly being upgraded with the gradual introduction of state of the art technology investments. This sector has great potential, as one of the main governmental targets is to institute Cyprus as the health service hub of the east Mediterranean.

Exhibit 12: factors influencing innovation potential by type of region

Region / type of region	Main factors influencing future innovation potential
Cyprus mono-region	• Strengths in tourism, financial services, health, pharmaceuticals, communications • Abundance of renewable energy sources • Large number of small firms concentrated on traditional sectors with limited capacity in introducing new technologies. • Small size of landholdings with limited applications of new production technologies. • Satisfactory level of research infrastructures but with inefficient technology transfer mechanisms. • Lack of collaborative culture between firms and public research sector • Low demand by firms for R&D activities.

5.2   A prospective SWOT appraisal of regional innovation potential

The overall appraisal of the innovation potential leads to the following conclusions:

Whereas a strong potential exists in the development of RTDI activities in high value added services, there is a growing tendency for all the latest technological needs to be covered from abroad. On the other hand, although there is sufficiency in terms of research centres and institutes, there is no linkage with the needs of the private sector. This may be one of the reasons that the majority of firms in Cyprus are scoring very low in RTDI activities, as this is a minor priority. Two more factors should not be overlooked: i) the financial and banking system in Cyprus is in a position to offer funding and support towards innovation services; ii) while the existing management structures could guarantee the smooth management procedures of innovative measures if the allocation of roles and responsibilities became more transparent.

Among the main threats for the Cyprus economy are the relatively low public R&D funding (although the political intention to increase it exists) and the slow adaptation to international competition. Considering the main weaknesses of the innovation and knowledge SWOT analysis, it should be mentioned that there is no clear strategy for innovation particularly at sectoral level. The existing technology transfer mechanisms are rather weak and inefficient further exacerbating the limited public-private collaborations in RTDI projects.

Exhibit 13: Innovation and Knowledge SWOT[29,30,31]

Cyprus	Opportunities	Threats
Strengths	▪ Tourism, real estate, shipping and banking are leading economic activities with high innovation potential, with increasing business demand for R&D collaborations with research bodies to enrich their know –how.	▪ There is a satisfactory level of infrastructure (research centres, institutes etc.), but low public and business R&D funding. ▪ Slow adaptation to international competition coming from low cost producing countries particularly in most services sectors (tourism etc), manufacturing and primary sectors. ▪ Low demand from the SMEs for funding RTDI activities. ▪ Delayed exploitation of renewable energy sources and development of technologies in relevant fields. ▪ Absence of a strategy for innovation at a national or sectoral basis ▪ State aids for the SMEs address limited needs (acquisition of equipment) overlooking R&D.
Weaknesses	▪ Low hierarchy of RTDI among the priorities of firms and particularly in SME's ▪ Weak links between research and the productive sectors. Existing technology transfer mechanisms are either at an infant stage, or do not bring the expected results. Research in fields with limited relation to the productive base of Cyprus. ▪ The financial and banking organisations could provide the essential human and financial capital for funding innovative ventures. ▪ Strong tendency from firms to cover the technological needs from abroad overlooking the endogenous possibilities	▪ Absence of a robust system for technology and innovation transfer ▪ Long term decline of the manufacturing and agriculture sector ▪ Absence of investment evaluation mechanisms for innovative enterprises

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[29] RISC Management Unit (2004) Regional Innovation Strategy in Cyprus – Action Plan. Lefkosia: June 2004.

[30] Report of Cyprus (2005), Standard & Poor's

[31] Strategic Development Plan (2004 – 2006)

5.3   Conclusions: regional innovation potential

Policy headline 1: Potential for further promoting the Banking and Financial Sector
- The financial intermediation sector, one of the most dynamic sectors of the Cypriot economy presents several opportunities for further development. The institution of state of the art ICT platforms for financial transactions, the establishment of the banking network as an intermediate body referring to EU funding toward SMEs and the development of suitable market mechanisms for funding innovative ventures and high tech start-ups by limiting the risk for such investments, are among the most promising possibilities for the sector.

Policy headline 2: Potential for Tourism Services upgrading
- The tourism sector also exhibits opportunities for further development, so that it can maintain its position as a locomotive of the Cypriot economy. The adoption or creation of innovative tourism services through their combination with recreational activities, with other high value added activities such as the health sector and with multifunctional agricultural areas (agritourism) are some of the alternative paths for the sector. Moreover, the introduction of new ICT logistical technologies that will enable the personalisation of services is another dynamic niche for the tourism market in Cyprus.

Policy headline 3: Development of rural areas through the promotion of multi functional agricultural space.
- The declining agricultural-rural areas of Cyprus could reverse the negative trends by exploiting opportunities provided on the one hand by the introduction of new technologies in agriculture that can increase productivity and the quality of products and on the other hand by combining agricultural activities with other economic activities such as tourism and health.

Policy headline 4: Development of rural areas through the exploitation of renewable energy sources.
- The development of technologies for exploitation of the abundant renewable energy sources such as solar, wind, etc. and the promotion of environmentally friendly technologies that will reverse the trends towards degradation of the natural environment are vital for the rural areas.

Policy headline 5: Support the declining manufacturing sector by promoting technology transfer
- Within the declining manufacturing activities, some sectors manage to exhibit positive trends, such as the pharmaceuticals, the food industry, plastics, electrical machinery and printing. However, these sectors in order to maintain their dynamic path need to adopt converging technologies at a faster pace. This could be achieved by enhancing their collaborations with PRO's and by promoting the establishment of new technology based firms and spin-off companies that will enrich the production mix in those sectors.

6 Future priorities for Structural Fund support for innovation and knowledge: options for intervention

Having gained valuable experience from the implementation of the 2004-2006 Strategic Development Plan, Cyprus is in a position to successfully stand up to the Community Strategic Guidelines for cohesion and the National Lisbon Programme requirements through setting suitable strategic priorities within the 2007-2013 NSRF.

Specifically, the policy priorities for the next programming period in terms of innovation and knowledge should focus on increasing secondary and tertiary sector value added, as well as the targeted upgrading of human capital and production methods based on specific sectoral needs such as converging technologies in traditional manufacturing sectors.

According to the draft version of the NSRF and the interviewed experts, the new Framework is in line with the development needs and challenges of Cyprus and contains priority pillars with special emphasis given to innovation related measures. These guidelines concern the reinforcement of business competitiveness, through promoting technology intense investments and assisting new innovative enterprises to mobilize initial funding. Additionally, a significant priority concerns the linkage between research & innovation activities and the productive sectors. Synergies with other community instruments, especially the 7th RTD FP have also been foreseen.

The increase of public investments in research, technological development and innovation is a top priority for the next programming period. Specifically, the NSRF foresees the doubling of R&D expenditure. Moreover, under the Research Promotion Foundation 51,6 ME will be disbursed up to 2008 for RTDI activities according to the recent statement of the President of Cyprus (13,8 ME for 2006, 17.2ME for 2007 and 20,6 ME for 2008). These extra resources should preferably be disbursed through measures supporting endogenous development of RTDI activities from the firms and particularly SMEs and the optimum exploitation of the ICT usage in the public sector. The first key challenge for the next programming period is to increase R&D expenditure from 0.37% of GDP in 2004 to 0.65% in 2008[32].

The strategic guidelines also set as a priority the essential entrepreneurial support by promoting collaborations with academic and research institutes through various measures. In the same line, the establishment of a Technological Park – that is currently under planning- could also provide assistance in doing so, particularly for SME's. Finally, there is provision for efficient e-government upgrading, as well as the establishment of a new financing instrument under the Ministry of Commerce that will ensure easier access to finance for innovative enterprises and reduce the risk for such ventures.

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[32] National Lisbon Programme of the Republic of Cyprus, Ministry of Finance, October 2005

6.1 Strategic orientations for Structural Fund investments in innovation and knowledge

Key conclusion 1: Lack of Innovative dynamic in Cypriot SMEs

Factors such as the very small size of local enterprises and their concentration on traditional activities and sectors leave very thin margins for the essential penetration of RTDI related investments in their short or even long-term strategies.

Recommendation 1: Incentives for differentiating the production mix and upgrading of the production capacity of existing firms and particularly of SME's.

- Production base upgrading and orientation toward higher value added and RTDI related activities.

- Increase collaborations between the various actors of the national innovations systems, i.e. with research centers and universities. Furthermore, these collaborations should have a long-term perspective.

- Measures for attracting foreign technology intensive enterprises in dynamic fields through the provision of specialised infrastructures and services, highly qualified personnel and exploitation of Cyprus favourable geographic position. (Cypriots SME's can act as subcontractors, specialised suppliers etc)

- Increase the extroversion of SME's, through networking, clustering and promoting international collaborations.

- Promote technology transfer with the creation of suitable infrastructures and adoption of subversive technologies (biotechnology, advanced ICT and materials, nanotechnology, advanced environmental technologies etc)

- Support the creation of new technology based firms and spin-offs in selected sectors such as pharmaceuticals, health services, plastics etc by providing infrastructures (incubators, science parks), funding (pre-seed capital – as in the Case of PRAXE in Greece), consulting services regarding IPR and creating the suitable regulatory environment and clear strategies regarding exploitation of research result in public research institutions.

- Provision of alternative incentives for encouraging the uptake of RTDI activities by SME's, such as favourable R&D tax treatment, development of clusters and networking with the participation of research institutes.

Key conclusion 2: Insufficient incentives to young researchers and low demand for qualified researchers both from the private and the public sector

The limited RTDI activities by firms and secondarily by the public sector create constrains in the employment of young researchers who have to search for employment opportunities either abroad or in other positions. Moreover, students willing to follow a research career are forced to receive the necessary education at a large extend from foreign universities and continue to work abroad due to the lack of career perspectives in innovation fields in Cyprus.

Recommendation 2 : Development of human capital in RTDI activities

- Increase number of training courses for young researchers in universities and research centers based on the economy's needs and in particularly in new subversive technologies (bio, nano, advanced materials, renewable energy etc).

- Promotion of a new generation of scientists into the dynamic sectors of the economy by providing suitable incentives to enterprises for their training and employment.

Key conclusion 3: Low efficiency of technology transfer system

There has been little attention given to the importance of technology transfer from public research organisations to enterprises. This is the result of the low efficiency of the existing technology transfer mechanisms, the low demand by firms and particularly SME's that focus on day to day operations and follow and due to the mismatch of the technologies and services offered by technology transfer organisations and the needs of enterprises.

Recommendation 3: Combination of Measures Promoting Secondary and Tertiary sectors investments in RTDI

- Upgrading and enrichment of existing technology transfer mechanisms through the employment of qualified personnel with experience in the technology transfer process (IPR, innovation management, familiarity with the importance of venture capital, pre-seed and seed capital for spin-off's, etc)

- Create a clear and robust strategy within technology transfer mechanisms for the commercialisation and exploitation of research results by enterprises. Moreover, this strategy should focus on subversive technologies (bio, nano, materials, ICT)

- Establishment of technology and science parks for hosting spin-off and new technology based companies.

- Create suitable market mechanisms for attracting private investments in innovative ventures as in the case of TANEO in Greece.

Key conclusion 4: Declining rural areas.
- The rural areas in Cyprus today face some serious challenges as a result of enviromental degradation, migration towards the urban centers and limited penetration of new technologies in agricultural production methods.

Recommendation 4: Promote alternative development paths for rural areas
- Promote the development of technologies for exploitation of the abundant renewable energy sources such as solar, wind, etc. by public research organisations and through public –private partnerships.
- Promote the adoption of environmentally friendly technologies that will reverse the trends towards degradation of the natural environment by providing incentives to enterprises, producers etc
- Promote the development of a multi functional agricultural space by combining agriculture with tourism (agrotourism), recreational and health services.

6.2 Operational guidelines to maximising effectiveness of Structural Fund interventions for innovation and knowledge

Key conclusion 5: Poor SF implementation results, brought to surface managerial and coordination impediments

The institutional, legal and financial framework of the national innovation system created impediments for the implementation of RTDI policies which have led to low absorption of the allocated RTDI resources. The poor results can be attributed to the problematic coordination within the organisations responsible for the implementation and the lack of specialised personnel. In addition, the insufficient flow of information within the various public bodies, and the general inflexibility of governmental mechanisms can also be earmarked. RTDI related investments funded by SF should be processed through authorised organisations that have an expertised division for the handling of this special category.

Recommendation 5: Establishment of an Exclusive Instrument for RTDI support, guidance and funding procedures

- Best practices adoption from countries with long experience in Structural Funds through consultation schemes, personnel transfer, training seminars etc

- Creation of clear strategy for RTDI with transparent and clear roles for all actors responsible for its formulation, implementation and monitoring. This can be achieved through foresight exercises with the participation of a large number of stakeholders, open consultation methods, etc

- During the current programming period there are no public or private structures strictly addressing innovation and knowledge. As proposed in Exhibit 7, a separate secretariat under the Ministry of Commerce, Industry & Tourism or the Planning Bureau could efficiently manage and supervise innovation and knowledge measures.

Exhibit 14: Summary of recommendations on investment priorities

Region or group of regions	Strategic focus	Priority measures	Indicative financial resources[33]
Cyprus mono-region	Support to SMEs	• Scientific staff recruitment, • Favourable tax incentives for R&D, development of clusters, networking • Incentives for investment in Converging Technologies (biotechnology, advanced ICT & materials, nanotechnology, advanced environmental technology)	• 30% of the funds directed to RTDI since SME's form the backbone of Cypriot economy. Moreover, SME's are not excluded from the other strategic focuses.
	Promotion of the Banking and Financial Sector	• Investment in Hi-tech ICT infrastructure for financial transactions • Establishment of the Banking network as an intermediate body referring to EU funding toward SMEs • Development of market mechanisms for financing of innovative ventures	• 10% of the total RTDI funds
	Tourism Services upgrading	• Creation of innovative tourism services and recreational activities • Development of clusters that link tourism with other high value added activities	• 15% of the total RTDI funds
	Development of rural areas	• Promotion of agrotourism and introduction of new technologies in agriculture • Combine agricultural activities with other economic activities such as tourism and health • Promote the adoption of environmentally friendly technologies and exploit the abundant renewable energy sources	• 30% of the total RTDI funds
	Support the declining manufacturing sector	• Promote the establishment of new technology based firms and enhance the technology transfer mechanisms • Promote the establishment of networking and clustering and promote collaborations with PRO's	• 15% of the RTDI funds

[33] 15-20% of the total SF with at least 10% directed to pure R&D measures in contrast to the 2004-06 period where the relevant funds were null.

Appendix A   Methodological annex

A.1   Quantitative analysis of key knowledge economy indicators

A 1.1   Factor analysis

In order to analyse and describe the knowledge economies at regional level in the EU, the approach adopted was to reduce and condense all relevant statistical information available for a majority of regions. The approach involved firstly reducing the information from a list of selected variables (Table 1) into a small number of factors by means of factor analysis.

Table 1. Reduction of the dataset (215 EU-25 regions) into four factors by means of factor analysis

	The 4 factors			
	F1 'Public Knowledge'	F2 'Urban Services'	F3 'Private Technology'	F4 'Learning Families'
Higher education (HRSTE), 2003	**.839**	.151	.190	.184
Knowledge workers (HRSTC, core), 2003	**.831**	.164	.267	.327
High-tech services employment, 2003	**.575**	.367	.428	.323
Public R&D expenditures (HERD+GOVERD), 2002	**.543**	.431	.275	-.195
Value-added share services, 2002	.323	**.869**	.002	.121
Value-added share industry, 2002	-.265	**-.814**	.386	-.061
Employment government administration, 2003	-.217	**.745**	.124	-.175
Population density, 2002	.380	**.402**	.043	.038
High and Medium/high-tech manufacturing employment, 2003	-.073	-.331	**.873**	-.089
Value-added share agriculture, 2002	-.222	-.350	**-.672**	-.198
Business R&D expenditures, 2002	.335	-.050	**.664**	.267
S&T workers (HRSTO, occupation), 2003	.560	.178	**.589**	.382
Population share under 10 years of age, 2001	-.237	.060	-.015	**.868**
Life-long learning, 2003	.472	-.009	.165	**.703**
Activity rate females, 2003	.418	-.227	.281	**.620**

Note: Principal Component Analysis. Rotation Method: Equamax with Kaiser Normalization, a Rotation converged in 9 iterations. Main factor loadings are highlighted in bold. Source: MERIT, based on Eurostat data, mostly referring to 2002 or 2003

Based on the variable with the highest factor loadings we can characterise and interpret the four factors and give them a short symbolic name:

Public Knowledge (F1)
Human resources in Science and Technology (education as well as core) combined with public R&D expenditures and employment in knowledge intensive services is the most important or common factor hidden in the dataset. The most important variables in Public Knowledge are the education and human resource variables (HR S&T education and core). Cities with large universities will rank high on this factor.

One interesting conclusion is that public and private knowledge are two different factors (F1 and F3 respectively), which for instance has implications for policy issues regarding Science-Industry linkages. Public R&D and higher education seems especially related to high-tech services, whereas Business R&D especially serves high- and medium-high-tech manufacturing.

Urban Services (F2)

This second factor contains information on the structure of the economy. It is well known that industrial economies are quite different from services based economies. It is not a matter of development per se, because in the European regions the variety of economic structure is very large and for a large part based on endowments and path dependent developments like the extent to which government administration is located in a region or not. This factor takes into account the differences between an industrial area and a service based area including the public administration services of the government. Another observation is that there are two different 'urban' factors, indicating that academic centres not necessary co-locate with administration centres. What may not be surprising is that the Urban Services factor is not associated with R&D, since R&D is more relevant for innovation in manufacturing than for service industries.

Private Technology (F3)

This factor contains business R&D, occupation in S&T activities, and employment in high- and medium-high-tech manufacturing industries. A countervailing power is the existence of agriculture in the region. One interpretation could be that agricultural land-use goes at the cost of possibilities of production sites. Another interpretation is that agriculture is not an R&D intensive sector.

Learning Families (F4)

The most important variable in this factor is the share of the population below the age of 10. Locations with relatively larges shares of children are places that are attractive to start a family. Possibilities for Life Long Learning in a region seem associated with the lively labour participation of the mothers of these youngsters. The Learning Families factor could also be interpreted as an institutional factor indicating a child-, learning- and participation- friendly environment, or even a 'knowledge-society-life-style' based on behavioural norms and values that are beneficial to a knowledge economy.

A 1.2   Description of the 11 types of EU regions

Types of regions

Public knowledge   □ Urban services   Private Technology   Learning families
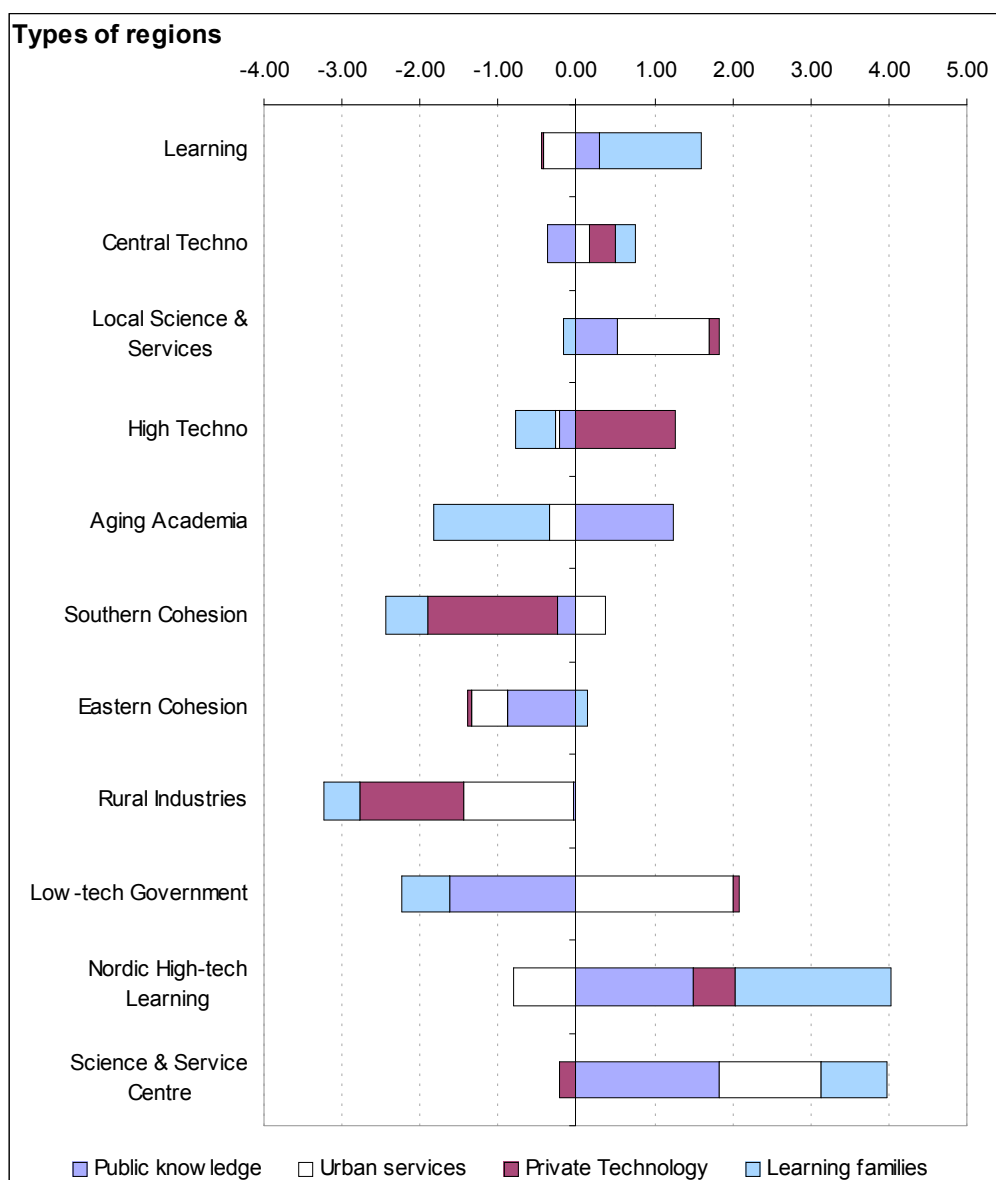
1 Learning

The Learning regions are first of all characterised by the high score on the factor 'Learning Families', and the three main components of this factor: life-long-learning, youth and female activity rate. On the other factors the regions are close to the regional average. Unemployment is on average the lowest compared to the other EU regions. Employment in the government sector is limited. GDP per capita is rather high. The regions are located in Austria, Ireland, the Netherlands, Sweden and the UK. There are many similarities with the Nordic High-tech Learning regions, but the business sector in the Nordic version invest more in R&D.

2 Central Techno

This is a rather large group of regions located mostly in Germany and France with close to average characteristic, but the share of High-tech manufacturing is rather

high. The factor-scores as well as GDP-per head is slightly above the regional average, except for the Public Knowledge factor which is slightly lower.

3 Local Science & Services

This group of regions with diverse nationality consist mainly of capital cities, such as Madrid, Warsaw, Lisbon, Budapest and Athens. These urban area's serve as national centres for business services, government administration, public research institutes and universities. Urban Services and Public knowledge are therefore the strongest factors for this type of region. GDP per capita is on average slightly below the EU25 average, but growing. The low score on life-long-learning is a weakness in most Local Science & Services regions, especially compared to the wealthier and advanced Science & Service Centres.

4 High Techno

The High Techno regions host many high-tech manufacturing industries. They are mostly located in Germany (e.g. Bayern and Baden-Wurtemberg), some in Italy (e.g. Lombardia and Veneto) and two French regions. This type is very strong in Private Technology and has a high level of GDP per capita. The factors Public Knowledge and especially the Learning Family factor shows a relative weakness, e.g. in life-long-learning. Growth in terms of GDP per capita has been low and unemployment didn't improve much in the previous years.

5 Aging Academia

This group of regions is mostly located in east-Germany and Spain and also includes the capital regions of Bulgaria and Romania. The strength in the Public Knowledge factor is mostly based on the high share of people with tertiary education. The low score on the Learning Family factor is due to little life-long-learning and hosting relatively few children. The unemployment situation has improved, but is still very high.

6 Services Cohesion

Services cohesion regions are located in Southern Europe, consisting of many Greek, some Spanish and two Portuguese regions. The low score on the Private Technology factor is striking. There is hardly any high-tech manufacturing nor business R&D. Services is the most important sector, but also agriculture is still a rather large sector. The share of manufacturing industry in value added is very limited. Population density is low, but on average it has been increasing.

7 Manufacturing Cohesion

Manufacturing industries is the dominant sector, whereas services and agriculture are rather small sectors. This type of region is mostly located in Poland, Czech Republic, Hungary and Slovak Republic. Two Portuguese regions are also included. The Public Knowledge factor is the main weakness of this type of regions. However, the score on the Private Technology factor is close to average, which means that it is much stronger in this respect than the Services Cohesion regions. Unemployment is high, even compared to Rural Industries and Services Cohesion regions.

8 Rural Industries

Besides a low per capita GDP, Rural Industries regions have in common a low score on both the factors Urban Services and Private Technology. Population density is

very low. The service sector is often very small. Especially agriculture but also manufacturing industries are relatively large sectors. Besides regions in Bulgaria and Romania

9 Low-tech Government
This type of region, mostly located in southern Italy is characterised by a very low score on Public Knowledge combined with a high share of employment in the Government sector. Unemployment is severe, on average comparable to Manufacturing cohesion regions. GDP per capita is however close to the regional average.

10 Nordic High-tech Learning
The Nordic version of the learning regions are typically strong in the Learning Family factor, but this type also has by far the highest business R&D intensity. In contrast with the popular characterisation of Nordic societies, the size of the government administration is the lowest of all the types. The low score on Urban Services is also due to the low population density. A rather unique feature of this type of regional knowledge economy is the combined strength in both the Public Knowledge and the Private Technology factor.

11 Science & Service Centre
The main characteristics of this urban group of regions are the high scores on the Public Knowledge and Urban Services factors. Population density is very high. This type also has the highest GDP per capita and productivity. The variables that are captured by the factor Learning Families also show a score above the regional average, but disappointing is the relatively low presence of high and medium-high-tech manufacturing and the business R&D intensity.

A.2   Qualitative analysis and preparation of country reports

In summary, the country reports were prepared in the following stages:

A first country document was prepared by the core study team in the form of a **template country report**. It contained overall guidance to the country experts and included a number of pre-filled tables, graphs and analysis sections based on information available at EU level.

Next, the core team members and the national experts who were involved in the pilot phase of the project commented completed elements of the templates. Drafted elements and templates were completed and compiled into **first country briefings (draft pilot reports)** by the national experts involved in the pilot phase of the project. These pilot country reports were prepared by experts for Belgium, Greece, Italy, France, and Poland.

Once the five first country briefings were completed, a **final set of guidelines** was prepared by the core team. These guidelines were agreed with the Commission services responsible for this evaluation. Prior to this, all first country briefings were reviewed during the January 2006 and presented to a first meeting of the scientific committee.

The work during the **country analysis phase** included:
Undertaking a series of key interviews (KI) with policy decision makers;
Organising a focus group (FG) with key national or regional RDTI stakeholders;
Collecting additional information and finalising short case studies; and
Preparing the synthesis notes of these various activities.

The above-mentioned work served as qualitative data and allowed the national experts to compile the draft **country reports**. All reports were subsequently reviewed, checked and finalised by the core team and the consortium members. Once this first check was completed, the core team organised a final peer reading of the document to verify its overall consistency and to ensure a final English language editing of the document. The core team then completed the final editing and layout of the document with a view to publication.
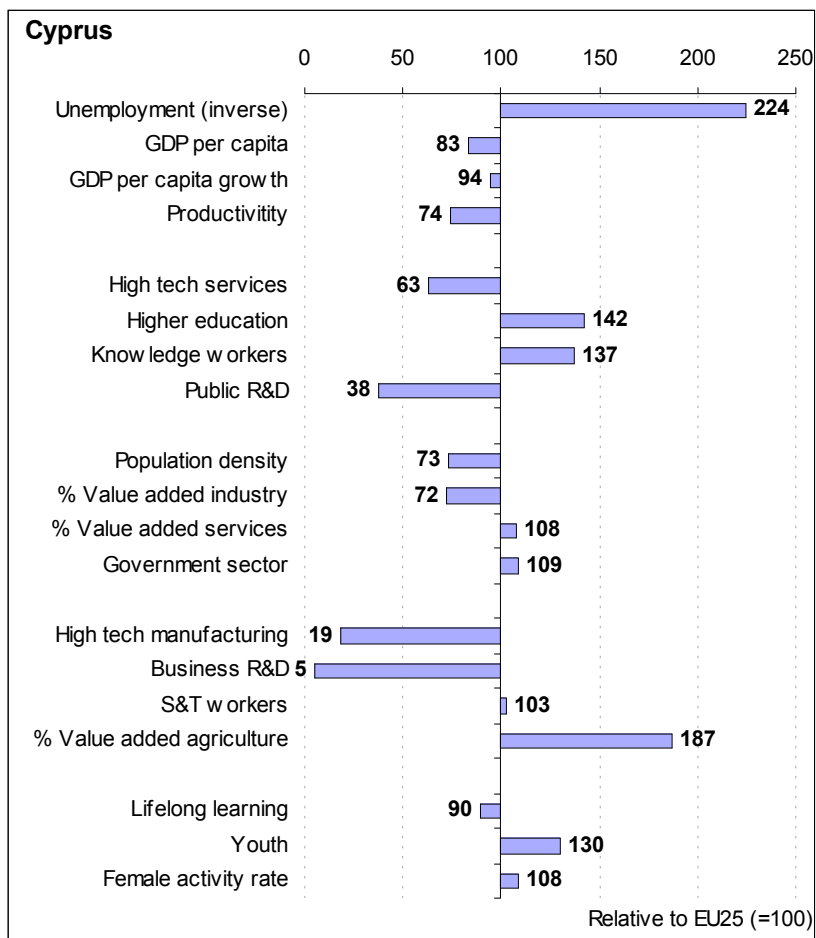
An overall synthesis report of all has been prepared and will be published by the European Commission providing an overview of the issues addressed in each of the 27 country reports produced by the evaluation team.

Appendix B   Statistical tables and regional scorecards

B.1   Overall quantitative analysis per region (CYPRUS)

Region	Cluster	Economic performance — Unemployment 2003	GDP per capita 2002	GDP per capita growth 1996‑2002	Productivity 2002	Public knowledge — High tech services 2003	Higher education 2003	Knowledge workers 2003	Public R&D 2002	Urban services — Population density 2002	% Value added industry 2002	% Value added services 2002	Government sector 2003	Private technology — High tech manufacturing 2003	Business R&D 2002	S&T workers 2003	% Value added agriculture 2002	Learning families — Lifelong learning 2003	Youth 2001	Female activity rate 2003
EU25		9,2	21170	4,8	4556	3,2	20,7	11,6	0,69	117	27,0	70,9	7,5	6,6	1,24	20,7	2,1	8,7	10,8	48,3
Regional average		9,4	18882	4,8	3914	2,8	18,9	10,7	0,49	294	28,9	66,6	7,6	6,5	0,80	19,5	4,3	7,1	10,5	47,2
Cyprus (CY)		4,1	17558	4,5	3357	2,0	29,5	16,0	0,26	85	19,4	76,7	8,2	1,2	0,06	21,3	3,9	7,8	14,1	52,4
Relative to EU25		224	83	94	74	63	142	137	38	73	72	108	109	19	5	103	187	90	130	108
Cyprus (CY)	1	4,1	17558	4,5	3357	2,0	29,5	16,0	0,26	85	19,4	76,7	8,2	1,2	0,06	21,3	3,9	7,8	14,1	52,4
Learning	1	4,3	23139	4,7	4900	3,2	22,1	12,5	0,40	216	30,5	66,0	6,0	6,2	1,12	22,0	2,4	15,1	12,2	53,8
Central Techno	2	7,5	20700	4,0	4884	2,9	18,7	10,6	0,42	182	30,0	66,8	8,2	7,5	0,84	20,7	3,1	6,7	11,2	47,6
Local Science & Services	3	9,2	19852	6,0	3780	4,3	23,6	13,7	0,88	389	22,0	76,2	9,8	4,6	0,79	22,4	1,8	5,9	10,4	46,9
High Techno	4	6,1	25202	3,6	5591	3,1	17,5	10,3	0,58	288	31,7	66,7	7,3	11,9	1,31	22,8	1,6	5,6	9,7	46,4
Aging Academia	5	13,3	17508	5,3	3649	2,5	27,4	13,2	0,67	185	30,1	66,9	7,6	6,7	0,57	18,8	3,0	4,8	7,4	46,0
Southern Cohesion	6	10,7	16213	6,3	3082	1,2	14,7	8,2	0,37	66	19,9	70,0	7,5	1,5	0,11	11,2	10,2	3,1	10,0	38,2
Eastern Cohesion	7	14,2	9776	5,3	1230	1,9	12,0	7,2	0,26	113	34,2	61,3	6,6	6,6	0,33	15,9	4,5	4,1	11,0	48,4
Rural Industries	8	10,3	8204	5,6	1120	1,6	14,8	7,8	0,17	62	33,6	52,0	6,0	4,5	0,18	12,9	14,5	2,6	10,1	45,3
Low‑tech Government	9	14,1	18553	4,1	4848	2,3	10,0	6,2	0,55	161	21,2	75,1	12,9	4,2	0,28	16,2	3,7	4,6	10,1	32,4
Nordic High‑tech Learning	10	6,4	23323	4,7	5202	4,5	28,5	18,7	0,41	67	29,9	67,9	5,4	7,6	3,05	30,2	2,3	25,0	11,9	58,2
Science & Service Centre	11	6,1	34489	5,3	6663	5,6	28,5	16,8	0,98	2118	16,8	81,2	7,4	3,8	1,00	30,5	0,8	12,8	11,4	55,5

B.2   Regional Scorecards

Cyprus

Indicator	Value
Unemployment (inverse)	224
GDP per capita	83
GDP per capita growth	94
Productivitity	74
High tech services	63
Higher education	142
Knowledge workers	137
Public R&D	38
Population density	73
% Value added industry	72
% Value added services	108
Government sector	109
High tech manufacturing	19
Business R&D	5
S&T workers	103
% Value added agriculture	187
Lifelong learning	90
Youth	130
Female activity rate	108

Relative to EU25 (=100)

591 Cyprus 060707.doc

Appendix C   Categories used for policy-mix analysis

C.1   Classification of policy areas

Policy area	Short description
Improving governance capacities for innovation and knowledge policies	Technical assistance type funding used by public authorities, regional agencies and public-private partnerships in developing and improving policies and strategies in support of innovation and knowledge. This could include past ERDF innovative action programmes as well as support for instance for regional foresight, etc.
Innovation friendly environment;	This category covers a range of actions which seek to improve the overall environment in which enterprises innovate, and notably three sub groups: innovation financing (in terms of establishing financial engineering schemes, etc.); regulatory improvements and innovative approaches to public services and procurement (this category could notably capture certain e-government investments related to provision of services to enterprises) ; Developing human capital for the knowledge economy. This category will be limited to projects in higher education aimed at developing industry orientated courses and post-graduate courses; training of researchers in enterprises or research centres[34];
Knowledge transfer and technology diffusion to enterprises	Direct or indirect support for knowledge and technology transfer: direct support: aid scheme for utilising technology-related services or for implementing technology transfer projects, notably environmentally friendly technologies and ITC; indirect support: delivered through funding of infrastructure and services of technology parks, innovation centres, university liaison and transfer offices, etc.
Innovation poles and clusters	Direct or indirect support for creation of poles (involving public and non-profit organisations as well as enterprises) and clusters of companies direct support: funding for enterprise level cluster activities, etc. indirect support through funding for regrouping R&D infrastructure in poles, infrastructure for clusters, etc.
Support to creation and growth of innovative enterprises	Direct or indirect support for creation and growth of innovative firms: direct support: specific financial schemes for spin-offs and innovative start-ups, grants to SMEs related to improving innovation management, marketing, industrial design, etc.; indirect support through funding of incubators, training related to entrepreneurship, etc.
Boosting applied research and product development	Funding of "Pre-competitive development" and "Industrial research" projects and related infrastructure. Policy instruments include: aid schemes for single beneficiary or groups of beneficiaries (including IPR protection and exploitation); research infrastructures for non-profit/public organisations and higher education sector directly related to universities.

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[34]   This is part of the wider area of in-house training, but in the present study only the interventions targeted to researchers or research functions will be analysed.

C.2   Classification of Beneficiaries:

Beneficiaries	Short description
Public sectors	Universities National research institutions and other national and local public bodies (innovation agencies, BIC, Chambers of Commerce, etc..) Public companies
Private sectors	Enterprises Private research centres
Networks	cooperation between research, universities and businesses cooperation between businesses (*clusters of SMEs*) other forms of cooperation among different actors

C.3   Classification of instruments:

Instruments	Short description
Infrastructures and facilities	Building and equipment for laboratories or facilities for university or research centres, Telecommunication infrastructures, Building and equipment for incubators and parks for innovative enterprises
Aid schemes	Grants and loans for RTDI projects Innovative finance (venture capital, equity finance, special bonds, etc.) for innovative enterprises
Education and training	Graduate and post-graduate University courses Training of researchers

Appendix D   Financial and policy measure tables

D.1   Additional financial tables

D 1.1   RTDI plus business (innovation technology) support

Objectives	Total cost	Structural funds			National funds	
		Total	ERDF	ESF	Public	Private
RTDI INTERVENTIONS						
Objective 2	14.583.000,32	6.762.068,16	6.762.068,16	0,00	7.820.932,16	0,00
TOTAL COHESION POLICY						
Objective 2	58.692.774,00	28.022.807,00	28.022.807,00	0,00	30.669.967,00	0,00

Programs	RTDI INTERVENTIONS			TOTAL		
	Total SF	ERDF	ESF	Total SF	ERDF	ESF
DOCUP Chypre Obj. 2	6.762.068,16	6.762.068,16	0,00	28.022.807,00	28.022.807,00	0,00
Total OPs	**6.762.068,16**	**6.762.068,16**	**0,00**	**28.022.807,00**	**28.022.807,00**	**0,00**

Categories 181 to 184 plus :
152 Environment-friendly technologies, clean and economical energy technologies
153 Business organisation advisory service (including internationalisation, exporting and environmental management, purchase of technology)
155 Financial engineering
162 Environment-friendly technologies, clean and economical energy technologies
163 Enterprise advisory service (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology)
164 Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs)
165 Financial engineering

D 1.2   Broad innovation and knowledge economy funding

Objectives	Total cost	Structural funds			National funds	
		Total	ERDF	ESF	Public	Private
RTDI INTERVENTIONS						
Objective 2	14.583.000,32	6.762.068,16	6.762.068,16	0,00	7.820.932,16	0,00
TOTAL COHESION POLICY						
Objective 2	58.692.774,00	28.022.807,00	28.022.807,00	0,00	30.669.967,00	0,00

This third calculation adds RTDI plus business (innovation & technology) support plus information society. As D.1.1 plus:
322 Information and Communication Technology (including security and safe transmission measures)
324 Services and applications for SMEs (electronic commerce and transactions, education and training, networking)

Finally, for pure RTDI (Categories 181 to 184) codes the allocated budget during the current programming period is null.

D.2 Summary of key policy measures per programme

Exhibit 15: main measures in favour of innovation and knowledge

Identified RTDI measure or major project	Focus of intervention (policy areas classification)*	Main Instruments**	Main beneficiaries***
Measure 1.1 Obj.2: aid to investment and business support services for SMEs in the manufacturing sector	**Knowledge transfer and technology diffusion to enterprises**	Aid schemes	Private sector
Measure 1.2 Obj.2: Business support infrastructure	**Innovation friendly environment**	Aid schemes	Private sector
Measure 2.1 Obj 2: facilitation of entrepreneurship and innovation – development of incubators	**Support to creation and growth of innovative enterprises**	Aid schemes	Private sector

* Classification of RTDI interventions: Improving governance capacities for innovation and knowledge policies; Innovation friendly environment; Knowledge transfer and technology diffusion enterprises; Innovation poles and clusters; Support to creation and growth of innovative enterprises; Boosting applied research and product development (see appendix).

**Classification of instruments: Infrastructures and facilities; Aid schemes; Education and training.

***Classification of Beneficiaries: Public sectors; Private sectors; Networks

Appendix E   Case studies

There are no case studies for the mono region of Cyprus available

Appendix F   Further reading

Bibliography of references/documents used

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Appendix G   Stakeholders consulted

Name	Position	Organisation
Adonis Constantinides	Senior Planning Officer Directorate for Economic Relations with the European Union	Planning Bureau
Dr. Alexandros Michaelides	General Director	TALOS Development Organisation
Dimitrios Lianos	General Director	LKN ANALYSIS Ltd