

# **NEW CHALLENGES AND OPPORTUNITIES FOR REGIONS AND SMES IN THE GLOBAL LEARNING ECONOMY**

## **1. INTRODUCTION**

Nowadays, globalisation is driving us to a process of transformation in economic performance, in shaping institutions and in the definition of economic policy. Globalisation is associated to positive aspects but also to mayor risks. Technology development, markets integration and international trade bring along with and increasing flow of commerce in terms of goods and services, capitals, technology and knowledge that make it possible economic growth and a better quality of life for the population. It is beyond question that the knowledge based economy implies new challenges and opportunities for regions and enterprises, specially small and medium sized firms. However, there are important costs related mainly with the environment and social cohesion.

To face actively these risks and to integrate the objective of sustainability in the public intervention makes it necessary apart from the achievement of a consensus and a balance among the economic, social, and environment objectives of the different policies to search for new competitive advantages that allow economic growth. For this reason, Europe has decided to transform itself into a knowledge based society, to reach a sustainable development based on employment of quality and a greater social cohesion.

A global and knowledge based economy requires in the context of Lisbon Strategy, to mobilize research, education, training and innovation to create growth and employment. This is to say, the revision of traditional innovation policies and the definition of new fields and forms of intervention to encourage the development of new entrepreneurial and employment opportunities.

In this way, and with the necessary support, small firms may have access to new knowledge and may become new vehicles of technology transfer and creation of employment for the whole society.

From a regional point of view, a good governance is a new source of competitiveness that facilitates cooperation and that improves public processes of learning; generation, transfer and diffusion of new knowledge, valuable for innovation. Governance will help to integrate society, less favoured regions and small sized organizations in the global networks of innovation.

The establishment of a regional framework of cooperation will facilitate coherence and integration of policies. Regional authorities are in a good place to accelerate the creation of networks and a good environment for promoting innovation.

## **2. TOWARDS A NEW CONCEPTUAL APPROACH: THE LEARNING ECONOMY**

According to the global economic changes, a new model of economy is rising up. In this model, knowledge production and transmission are strategic to open new challenges for business and new opportunities for innovation.

The OECD defines knowledge based economies as “economies which are directly based on the production, distribution and use of knowledge and information”<sup>1</sup>. This new economy is about the use and exploitation of all types of knowledge within all manners of economic activity.

The fact that knowledge is not always easily packaged as a commodity makes it necessary interaction and learning to take advantage of the whole process.

New competitive advantages are no longer associated to technology but to knowledge. Taking into account that knowledge can be very specific or tacit, human beings have the responsibility to transmit it, so that it can be assimilated and used.

The assimilation of new knowledge takes place in the context of the learning economy. Learning is the key asset to allow innovation and to improve competitiveness. Learning economy emphasizes the capacity of organisations and institutions to generate and learn new knowledge, and to adapt to global changes.

For this reason, learning economy comes out as the theoretical approach to develop new rational bases for future public intervention and for shaping a new policy of innovation.

The development of the learning economy, based on the improvement and mobilization of social capital implies the study of the global innovation process under a more integrating or systemic perspective than the one that traditional innovation theories maintain.

### **2.1. Innovation theories**

The evolution of innovation theories can be explained by the increasing importance of social ingredients.

#### *1. Technology-push theory*

It is basically a linear model where the main source of innovation lies on research and development (R&D) effort.

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<sup>1</sup> OECD (1996)

## 2. *Market-pull theory*

Innovation is the new source of ideas for solutions asked by the market. Still, R&D is the main source for developing new products or for improving processes.

## 3. *Chain-link theories*

Linkages between knowledge and market are not automatic as assumed by market-pull theories of innovation. The focus of these theories lies on the information generated through the linkages between the firm and its customers and suppliers.

## 4. *Networks theories*

These theories, under the label of “systems of innovation” put the stress on the importance of sources of information that are external to the firm: clients, suppliers but also consultants, governments, universities, research and technology centres.

## 5. *Social network theory*

The new contribution of this theory is the growing importance of accumulative knowledge as a production factor and as a determinant of innovation.

Modern approaches to innovation agree on the fact that the key aspect is to transform information into knowledge. Knowledge is the main determinant of competitiveness. As knowledge is not only generated in universities and research centres, but also in “learning by doing” and in “learning by using”, this has many implications for improving public intervention in the field of innovation and for revising the role of traditional institutions.

Organisations and institutions need to manage innovation processes to increase knowledge productivity and to facilitate learning providing an accurate confidence framework for cooperation and interaction where new competitive advantages can emerge.

## **3. THE NEW COMPETITIVE ADVANTAGES: KNOWLEDGE AND SOCIAL CAPITAL**

### **3.1. Knowledge**

Knowledge becomes a new competitive advantage. Information is no longer useful unless it is transformed into knowledge through learning. Learning requires institutions and enterprises to play an active role in helping economic actors to develop new abilities and build up innovation capabilities. For this reason, knowledge must be exchanged, assimilated and transferred to detect opportunities of innovation.

But knowledge can be tacit or codified. Tacit knowledge is transferred only through social interaction taking into account that people and organisations are the ones that actually produce, transmit and learn new knowledge. In this sense, proximity and confidence are necessary conditions for learning.

Through learning, individual actors, organisations and institutions may adapt to the global changes. For this reason, learning economy must be the new approach to define a more global and systemic policy of innovation that considers not only technology but also interaction with industrial policy, research policy or science policies to promote regional competitiveness and the capacity of SMEs to integrate in the global context of innovation through new forms or organisation such as networking.

Learning economy tries to overcome social, cooperative and interactive dimension of knowledge, this is to say, social capital. Social capital includes those elements of social organisation that facilitate coordination and cooperation and for this reason, accelerate information transfer and knowledge development. Social capital makes it possible interaction inside firms, between networks of firms and cooperation throughout the institutional environment in a globalized world.

### **3.2. Social capital**

Social capital improves capacities to acquire information, to incorporate new information to economic processes and to manage these processes to allow innovation. It is part of the collective capital of an economy, so that it increases production capabilities and therefore, makes it possible economic growth.

In a global world, networks have come out as organisations able to cooperate and interact. This new form of organisation has emerged as a successful way of fostering learning and reinforcing synergies between actors to take advantage of the use of knowledge to create new possibilities of innovation.

The specific proceeding of networks and their competitiveness depends above all, on the confidence within their integrating members. The source of this confidence is the social capital. Social capital helps to explain the relevance that networks have acquired in recent economic literature.

Confidence, proximity and culture become differential features of an economy. For this reason, they have turned out to be central aspects in the definition of new global policies of innovation.

Many definitions of social capital can be found in literature<sup>2</sup>. Nevertheless, from the innovation point of view, an approximation to the concept should include the following:

*“The capacity of a social group to acquire information, to incorporate this new information to economic processes and to manage the whole process”<sup>3</sup>.*

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<sup>2</sup> Ayerbe, M. p. 178.

According to this concept, social capital has to do with a wide range of processes and forms of cooperation and interaction through people and organisations, that allow transforming valuable productive information and accumulated knowledge into learning that finally, leads to innovation.

What is clear is that learning and social capital take place and develop themselves through certain networks, organisations and institutions that accelerate cooperation and help to coordinate activities.

These networks improve learning facilitating the exchange of information and knowledge transfer. At the same time, this contributes to a more efficient decision-making.

Organisational structures embedded in the social capital can improve the possibilities of less favoured regions and small firms to get better access to innovation participating in cooperative projects with other regions or firms, to integrate themselves in a competitive network of innovation at international level.

For the policy-makers, this new approach of performance based on interaction and social capital to allow leaning and to take advantage as much as possible of knowledge, has very important implications in terms of widening up the debate of the definition of global innovation policies, increasing participation of citizens, institutions, regions, universities and education centres. At the same time, bigger participation will contribute to better transparency, leadership and coordination of policies.

For this reason, it must be underlined the determination of public sector in the general context of innovation policies, to support the development of social capital in the community through active regulations, fostering alliances and cooperative projects and finally, providing certain institutions that are able to reinforce cooperation and interactive learning.

For a better comprehension of the new role that public authorities can play for fostering innovation, it is necessary, first of all, to analyse the general position of Europe in terms of the knowledge-based society to detect needs and priorities in order to a better definition of the public intervention.

#### **4. POSITION OF EUROPE IN THE KNOWLEDGE BASED SOCIETY**

Considering that the Information and Communications Technologies (ICT) sector accounts for 40% of recent productivity growth in Europe and 60% in the USA, this sector tends to be a good indicator of innovation capabilities. The use of this indicator to evaluate the position of Europe in the knowledge based society is justified for the power of this sector for stimulating economy-wide innovation, creativity and competitiveness and underpinning all scientific and technological progress.

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<sup>3</sup> Rodríguez, P. y Román del Río, C. p. 218.

The ICT sector itself generates 6-8% of GDP and devotes 10-20% of its output to new knowledge generation<sup>4</sup>. From a social point of view, this sector helps to meet growing demand for better health care, efficient education and lifelong learning, better quality of life, security and social inclusion. ICTs contribute for the knowledge economy and to a stronger and sustainable growth, making it possible high quality jobs. This was already highlighted by the Commission at the Lisbon Strategy.

An indigenous research capacity is essential to be able to master and assimilate technology and to exploit it to economic advantage. This is particularly true for ICT where innovation moves at an even faster pace, where the frontiers of research are increasingly broader and where people and organisations depend more and more on ICTs.

But Europe as a whole is not investing enough. ICTs account for more than a third of the total R&D budget in OECD countries but only 18% in Europe. The European ICT research investment is about one third that of the USA and is 30% lower than in Japan.

Table 1.

<b>ICT R&amp;D</b>	<b>EU 15</b>	<b>US</b>	<b>JAPAN</b>
<b>ICT R&amp;D/TOTAL R&amp;D</b>	<b>18%</b>	<b>34%</b>	<b>35%</b>
<b>Public sector investment (Euros)</b>	<b>8 B</b>	<b>20 B</b>	<b>11 B</b>
<b>Private sector investment (Euros)</b>	<b>23 B</b>	<b>83 B</b>	<b>40B</b>

B: billions. Figures from 2000. Taken out from Information Society Technologies (2005), p. 4.

Apart from the deficit in the public investments, European investment in ICT R&D within the private sector also needs substantial increase to reach the levels of mayor competing regions of world.

In addition to this problem, European scene for ICT research, and in any case, for research in any sector is very fragmented in terms of public funding across a number of structures at European, national and regional level, each with differing policies, strategies and objectives. Some of the aspects where fragmentation of markets is particularly important is in the lack of a European Stock Exchange for Technology companies. This creates an under funding of European start-ups. Venture and Seed capital initiatives can benefit to small and medium sized firms to open new markets.

In 2005, risk capital investment in the USA was 40% higher than in Europe<sup>5</sup>. This hinders the exploitation of innovation opportunities and commercialization of research results. However, from a systemic and integral point of view of innovation, more than financing, what is critical is the lack of mechanisms that accelerate knowledge transfer and facilitate cooperation between generators and users of knowledge.

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<sup>4</sup> IST (2005), p. 3.

<sup>5</sup> EC (2007), p. 12.

The European Union goals in R&D, as set by the Lisbon strategy are to achieve by 2010 a R&D intensity of at least 3% of R&D and to have 2/3 of R&D expenditure financed by the business enterprise sector. In 2004, R&D intensity, this is to say, R&D expenditure as a percentage of GDP, in the EU-27 stood at 1.87%. R&D intensity remained lower in the EU-27 than in other economies. R&D expenditure was 2.62% of GDP in the USA and 3.33% in Japan. The data, therefore, points out again that there is a considerably innovation gap between EU-25, the United States and Japan.

Table 2.

**R&D EXPENDITURE AS % OF  
GDP (2005)**

<b>US</b>	<b>2.62</b>
<b>JAPAN</b>	<b>3.33</b>
<b>EU-27</b>	<b>1.87</b>

Source: EC (2008)

In any case, innovation differs not only between OECD countries but also inside Europe. Considering the European average of R&D expenditure as 1.87% of GDP, it must be outlined that there are many differences at State Members level<sup>6</sup>, regarding the R&D effort according to the Eurostat figures. For example, R&D expenditure in Sweden is 3.86% of GDP or 3.48% in Finland. However, Spain only reaches 1.12% of GDP and Portugal or Greece are lower than 1% (0.81 in Portugal and 0.61 in Greece). To go further, in 2003, the top 10 EU regions performing R&D account for 29% of total R&D, while the other EU-27 regions only reached 70.9%<sup>7</sup>.

In terms of financing, in 2004, 55% of EU-27 R&D expenditure was financed by the business enterprise sector. At national level, only three EU-27 Member States fulfilled and even surpassed the second EU goal of having two thirds of R&D expenditure financed by the business sector: Luxembourg (80%), Finland (69%) and Germany (67%). In any case, the highest proportion of business R&D expenditure was spent in the largest enterprises (more than 500 employees)<sup>8</sup>.

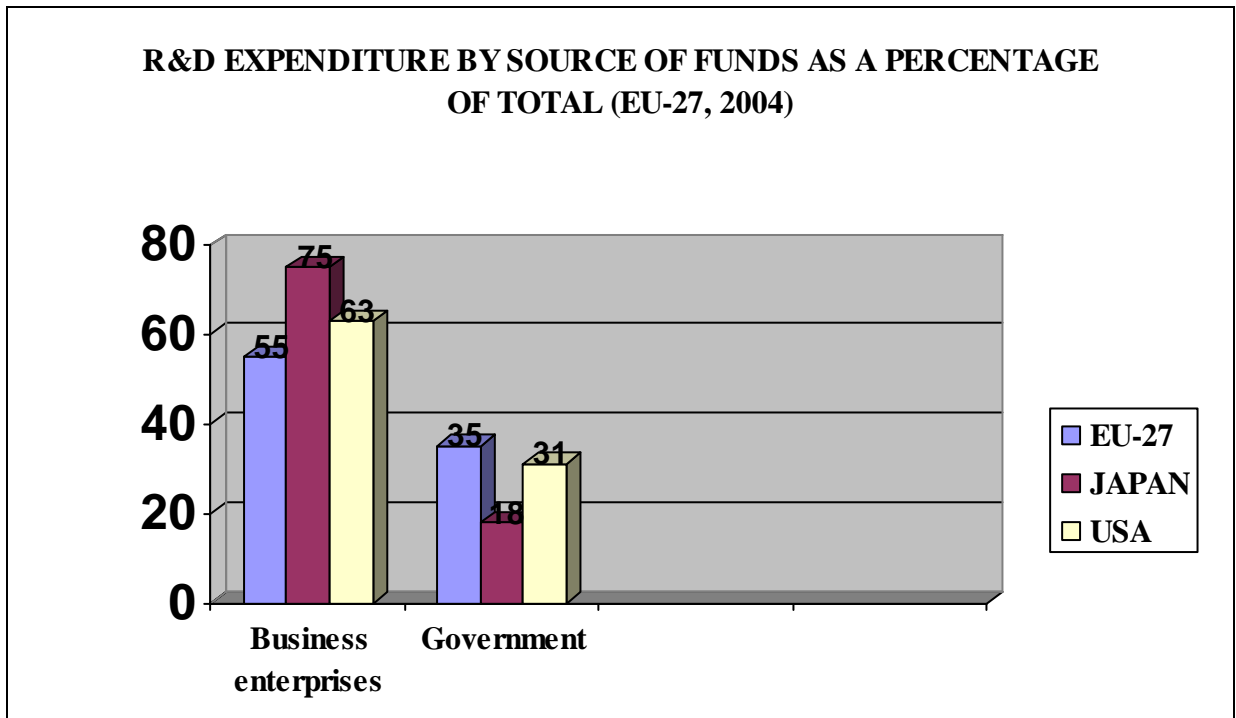
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<sup>6</sup> European Innovation Scoreboard 2005 (EIS 2005) is the policy instrument developed by the European Commission under the Lisbon Strategy to evaluate and compare the innovation performance of EU Member States. According to this scoreboard, European countries are divided into four groups, depending on their innovation performance: leading countries, average performance, catching up and losing ground. Spain is in the losing group. For further information on data, see <http://www.trendchart.org>

<sup>7</sup> EC (2008), p. 22.

<sup>8</sup> EC (2008), p.10-11.

Figure 1.



Source: Eurostat, R&D Statistics

Comparing with USA or with Japan, data remained still lower in terms of R&D financing. While business enterprises financed in 2004, 55% of total R&D expenditure, in Japan this data was 75% and in USA 63%.

In terms of employment, in 2004, 1,44% of total EU-27 employment was made by R&D personnel (1,66% in Japan in 2003). At national level, the highest shares of R&D personnel in total employment were observed in Iceland (3,53%), Finland (3,24%) and Sweden (2,51%). 49% of researchers were concentrated in the business enterprise sector<sup>9</sup>.

Unemployment tends to concentrate on low qualified people. In 2005, unemployment rate in Europe for highly qualified workers in science and technology was 3,4%, as for not qualified people was 10.3%<sup>10</sup>.

In 2003, the population with tertiary education was 38% in the USA, and 37% in Japan. However, in 2005, it was still only 23% in Europe<sup>11</sup>.

High unemployment rates in Europe suggest that some efforts should be made to better exploit the job creation potential of entrepreneurial activity to start new business and to take new risks to expand current activity.

In the EU-25, self-employment accounted for about 16% of total employment across the non-financial business economy in 2005, with over three times as many male

<sup>9</sup>EC (2008), p. 27.

<sup>10</sup> Eurostat (2007), p. 67.

<sup>11</sup> EC (2007a), p. 15.

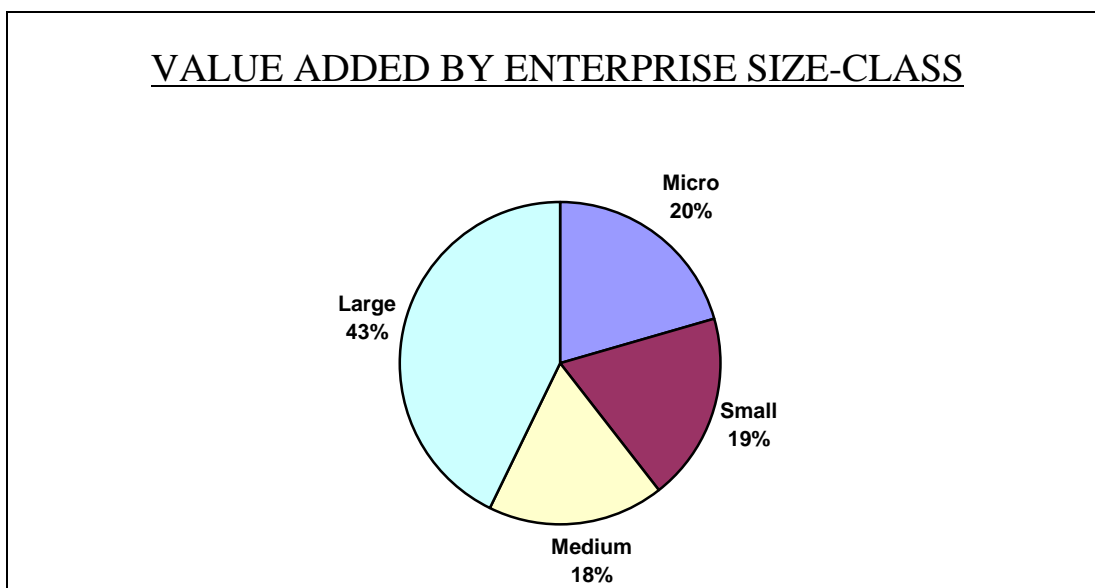
self-employed workers as women<sup>12</sup>. The main reason to be self-employed is personal independence, self-fulfilment and the possibility to create own environment. The EU's entrepreneurial gaps and potential compared to the EU average of 45% as much as 67% of USA's citizens that would prefer to be self employed<sup>13</sup>.

Regarding involvement in new entrepreneurial initiatives, 4.5% of EU citizens are currently taking steps to start a business, have set up a business or taken one over the last three years. At 13%, the rate in the USA is significantly higher<sup>14</sup>.

Considering the number of innovative enterprises, in Germany, 65% of enterprises were active in innovation in 2004, which was far more than the EU-27 average of 40%<sup>15</sup>. At EU-27 level, nearly 24% of innovative enterprises considered the hampering factor "Innovation costs are too high" to be highly important. In 2004, innovative enterprises, those that cooperated were less than 40%<sup>16</sup>.

Anyway, the position of Europe in terms of the knowledge based economy should not forget the reality of the small and medium sized firms. In this sense, SMEs are a big powerhouse of Europe's economy. SMEs are defined by the European Commission as having less than 250 persons employed. They account for 99.8% of the total number of companies, for two-thirds of employment and nearly 60% of value added<sup>17</sup>.

Figure 2.



Source: Eurostat, data for 2003.

Enterprise size-class: Micro (1-9 persons), Small: (10-49 persons), Medium: (50-249), Large: +250

92% of all European enterprises have less than 10 employees. 7% are small, less than 1% are medium-sized and only 0.2% are large enterprises<sup>18</sup>. Within SMEs, the

<sup>12</sup> EC (2006b), p.6.

<sup>13</sup> COM (2003), p. 8.

<sup>14</sup> COM (2003), p. 8.

<sup>15</sup> EC (2008), p. 59.

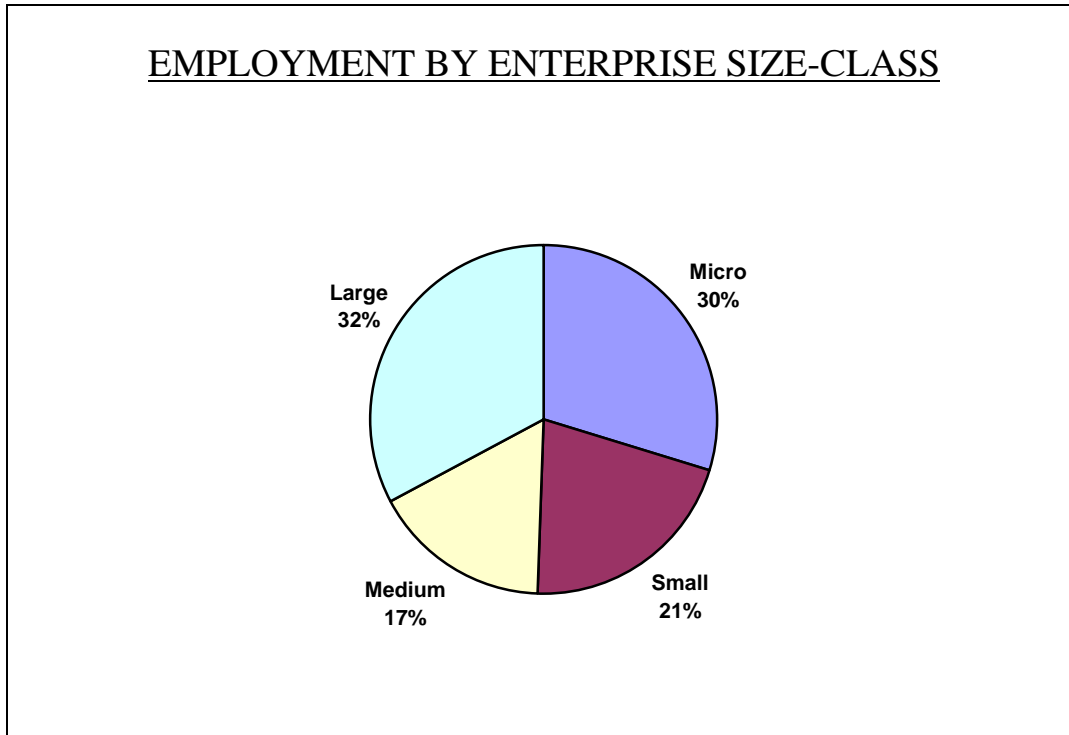
<sup>16</sup> Eurostat, Community Innovation Statistics, 2004.

<sup>17</sup> EC (2006a), p. 17

<sup>18</sup> EC (2004), p. 53.

major share of employment is in micro enterprises, enterprises employing less than 10 employees.

Figure 3.



Source: Eurostat, data for 2003.

Enterprise size-class: Micro (1-9 persons), Small: (10-49 persons), Medium: (50-249), Large: +250

According to Eurostat data for 2004, large enterprises are the ones that invest more in R&D, whilst small and medium sized firms find it more difficult to invest. They account for 17,5% of business enterprise R&D expenditure. Large firms account for 82,5%.

Table 3.

**BUSINESS ENTERPRISE R&D  
EXPENDITURE IN EUR MILLION BY SIZE  
CLASS (2004)**

0 persons employed	34
1 to 9 persons employed	1374
10 to 49 persons employed	5872
50-249 persons employed	14257
<b>SMALL AND MEDIUM SIZED</b>	<b>21537</b>
250 to 499 persons employed	8700
500 and more	93345
<b>EU-27</b>	<b>123582</b>

Source: Eurostat, R&D Statistics

## **5. NEW CHALLENGES FOR REGIONAL INNOVATION POLICIES IN EUROPE**

Europe is embarked on a race to become more innovative, competitive and sustainable. In general terms, this will depend on the ability to diffuse technologies and disseminate knowledge towards all areas of the European economy and society.

The evolutionary and systemic perspective of the innovation theories from the regional development point of view implies a conception of the space as an integrating element that makes it possible new advantages in terms of proximity and agglomeration economies.

Individual and collective relationships take place in a geographical context, it is in this background where learning emerges and makes it possible knowledge diffusion and usage.

Distance becomes a great barrier for regions because makes it difficult confidence and implies uncertainty. In a global world, enterprises competitiveness depends more and more on the local economy and on its social capital.

In this sense, regions are sources of relational advantages where informal networks, collaboration partnerships, clusters and different forms of associations appear to facilitate learning.

Regions become necessary holders of knowledge creation and of interactive learning for facilitating innovation based on highly specialized skills, institutions, related business and customers.

The challenge for any region is to be a “learning region”; therefore, source of innovation, growth and vehicle of globalisation. For this purpose, regional policy is aimed at the strengthening of social capital and at the creation of an accurate framework for interaction. This challenge implies organisational changes at the public sector to develop and integrated and global strategy to operate over the whole system of innovation.

A global strategy should incorporate the following necessary issues: innovation, financing of innovation, entrepreneurship, interaction, research and science policies, education and governance.

### **5.1. Innovation**

Innovation is the way to increase competitiveness, to create good employment and to reach an economic sustainable development.

New challenges demand:

1. The need to reinforce the efforts in R&D,
2. To face fragmented and disperse schemes fostering innovation and
3. To overcome the diversity of regions performing innovation at European level at a very different scale in terms of capabilities and results.

Considering the increasing budget of R&D, innovation policy should continue on its trend to support R&D. However, this effort should carry out now, under a new point of view, more cooperative and integrating, supporting cooperative projects of research between several institutions, regions and State Members. This is the priority of Commission research and technology Framework Programme 7<sup>th</sup><sup>19</sup>, to strengthen cooperation between industry and academia across Europe, obviously pushing for excellence.

An innovative economy requires improvement in both the level and the quality of R&D investment. With competition at a global scale, there is a need to improve significantly Europe’s attractiveness for investment in R&D, so that the world’s best researchers can be attracted to its laboratories.

This requires both higher public investment that pushes further the excellence of knowledge and skills and public funding to strengthen Europe’s centres of excellence.

### **5.2. Financing of innovation**

Private expenditures on innovation are suboptimal. This is caused on the one hand, by the limited appropriability of new knowledge and on the other hand, by problems of asymmetric information in the capital markets (when a bank has less information about the value of certain projects than the entrepreneur). This fact undermines a firm’s capacity to raise external funds.

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<sup>19</sup> See <http://www.cordis.lu/fp7/home.html>

Sometimes, a variety of instruments exist within national borders, making necessary more systematic efforts to inform and to make existing instruments simpler and more accessible.

In any case, private sector tends to be reluctant to invest in pre-seed and seed phases of research, especially considering SMEs. There are many reasons why SMEs find it difficult to raise finance from banks and equity for investors. Investing in R&D and innovation is risky and is very difficult to predict how successful the end result will be. In general, financing problems are more pressing in the start-up and early development stages, and this is particularly the case in high technology sectors.

This market failure can be faced by mobilising private funds but public financing continues to be inevitable.

In the United States, venture capital investments at the early stage of activity of a company (0.072% of GDP) were in 2002 more than three times larger than the investments in Europe in 2005 (0.023% of GDP)<sup>20</sup>.

In any case, policy has a key role to play, more than in R&D financing, in ensuring generation of new knowledge through accurate protection of intellectual property rights. European firms are less likely to patent an equivalent invention than American firms, due to possible differences in attitudes to Intellectual Property; the cost of intellectual property or knowledge about how to apply for it. The argument for policy intervention is strongest for small and medium sized firms with less than 250 employees, since larger firms are more likely to have the financial resources to exploit intellectual property.

A high percentage of Europe's largest firms also have expert service in-house and more experience in applying for a patent. SMEs tend to use non formal protection methods such as secrecy or design complexity. At the same time, SMEs have lower rates of innovative activity compared to larger firms.

### **5.3. Entrepreneurship**

Entrepreneurship is a key asset in the innovation policies because is the way to exploit new opportunities of business and to create employment of high quality. For this reason, it is necessary to encourage individuals to become entrepreneurs and to take advantage of new innovative opportunities.

This means that on the one hand, financing must be provided. Business start ups have difficulties in getting the seed and early stage finance they need. Europe should continue developing its risk capital markets as an alternative to bank lending. In this sense, risk sharing between public and private sectors can help increase the availability of finance.

On the other hand, education and training should encourage entrepreneurship, fostering a right mindset, awareness of career opportunities and accurate skills.

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<sup>20</sup> EC (2007a), p. 16.

Bottlenecks in the labour market create barriers to growth and efforts are needed to develop skills of workers.

At the same time, administrative barriers make it difficult to run a business. Regulation does not differentiate according to firm size and this affects them specially. Public authorities should reduce administrative burdens or introduce exceptions for SMEs or provide support or information for them.

Also, appropriate tax measures are necessary to promote new firms in terms of income tax rates and labour taxes.

Finally, it is necessary to foster positive attitudes towards entrepreneurship, rewarding successful business projects or promoting exchange of best practices. Technology transfer support services are strategic for the valorisation of research results and for helping to succeed in the market as a new entrepreneur. All this means that interaction between actors is another strategic issue to take into account in the innovation policies.

#### **5.4. Improvement of interaction between actors**

Actually, the great added value of European regional policy comes out from the capacity to establish new opportunities of innovation through the promotion of firm's interaction and regions networking and through the establishment of new partnerships for assisting regions and firms in innovation.

European efforts to reinforce cooperation have allowed the creation of networks through the Innovation Relay Centres or through the Innovation network for the regions in Europe that among other questions; have made it possible the exchange of best practices. All this have been supported by the regional development funds.

But interaction is not only helpful from the regions point of view but also for the SMEs and private sector in general. For SMEs, cooperation facilitates access to new knowledge and larger markets, for largest enterprises this will make it possible cost reduction.

At the same time, human resources mobility will allow to share and diffuse knowledge throughout the economy, institutions networking and linking of firms to foster innovation and taking advantage of new knowledge overcoming more ambitious projects in a cooperative way producing spin-offs as a way of exploitation of research results.

In this sense, at a larger scale, a regional cluster approach tends to be an accurate approach for the definition of a regional policy to encourage learning and knowledge development through networking.

Clusters can help to create and exploit social capital in a region. A cluster policy may contribute to link firms to regional and global technology infrastructure. The role of public organisations as mediators in encouraging joint projects and inter-firms networks within the cluster may contribute to overcome the problem of the different capabilities of European regions in terms of innovation opportunities. Public

institutions have close contact with local firms and are aware of their problems. In this way, local industry and firms could have access to knowledge and innovation and even more, participate in the policy design.

The exchange of clustering experience around Europe and existing best practices will contribute to detect opportunities of growth for less developed areas in Europe.

It is necessary a general commitment for change from all the regions in Europe that helps to set up clusters or similar structures where can emerge synergies and innovative initiatives that will meet necessary support in terms of human resources, risk capital, access to knowledge, management experience and technical assessment to reach the market.

### **5.5. Research and Science policy**

An increasingly global and knowledge based economy requires the modernisation of universities and traditional higher education institutions. At this point, it should be considered the new role that technology centres, research centres, universities and educational centres can play in producing and transmitting knowledge, in providing new skills to manage knowledge and innovation, and in transferring scientific advance results to the whole community.

The new challenges require some changes involving academic centres, universities and research and technology organisations to improve their performance, to modernise themselves and to become more competitive:

- To break down the barriers between them to cooperate themselves and to promote mobility for researchers, students and staff between institutions, disciplines, sectors and countries. There is still lack of mobility at European level.
- To provide incentives for partnerships with the business community. This also can bring additional funding for them through training, research and technology transfer projects.
- To provide skills and competences for the labour market to succeed in a global world involving firms in the definition of curricula and funding and widening training opportunities for adults and workers.
- To enhance interdisciplinary as technology and research become more complex. Interaction and mobility will help to achieve this.
- To share knowledge with community and to disseminate research results through an active communication strategy based on conferences, discussions or open dialogues with citizens.
- To acquire excellence to attract best academics and researchers in a context of global competition. European education and research centres need to adapt to the changing and globalized economy. They have to compete globally in providing graduates and on attracting students and researchers.

For SMEs is particularly interesting the help that research and science centres, universities or technology centres can offer them, specially in high technology field, as they need technical assistance, technology transfer support and opportunities to establish interactions to absorb external knowledge and to innovate successfully.

In this sense, European Cohesion Policy through European Regional Development Fund (ERDF) provides support through incubators and science parks to spin out knowledge into the market and to create better links between SMEs and universities, both in terms of regional and trans-regional interaction.

The Commission can also facilitate dialogue between universities and social partners to promote networks<sup>21</sup>.

There is certainly an important value for industry and the academic research community to work together and define strategies and agendas for research that all actors can benefit from. Interaction between universities, businesses and research and technology centres contributes to dissemination and exploitation of new knowledge.

But if academic excellence and research potential are essential for technology transfer and application of new knowledge, the competitiveness and productivity of European industry is linked to its qualified and flexible workers capable to adapt to changes and to learn during professional life. This means that education policy is essential for innovation.

## **5.6. Education**

To reach an innovative Europe, there is certainly one aspect that should be of great significance for defining global policies. This would be the role of education as an integrating element for the whole community in the challenges of new knowledge economy: citizens, small firms and less advanced regions.

As long as education level is higher, unemployment rate reduces itself. Labour market is featured by an increasing demand of qualifications. Education and training will contribute to face structural unemployment and to reach geographical and occupational mobility.

The priorities of the education policy would be the following:

- To increase access to higher education, to recycling and to continuous training as means to adapt to permanent changes, to improve labour conditions and to create and integrating labour market to reduce unemployment and regional differences.
- To mobilize social actors, institutions and private enterprises at European, national or regional level to identify market priorities in the long run and to participate in the design of coordinated education strategies.
- To promote training in enterprises as they do not tend to offer training for their workers and they should also participate in the design of training actions specifically oriented to their needs.

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<sup>21</sup> The Commission created a trans-European network aimed at facilitating technology transfer “The Innovation Relay Centres (IRCs) network. It is based in 33 countries and provides personalised assistance for universities and industry, specially for SMEs. <http://irc.cordis.lu>. Also, the establishment of a European Institute of Technology (EIT) will help to promote research institutions and industry interactions to accelerate technology transfer. This is an example as well, of innovative governance model as in its governing body take part both business and academia expertise to develop a business oriented approach to governance. COM (2007), p. 7

- To facilitate the use of new information and communication technologies in providing training and education. This is essential to achieve interactive and flexible learning and to reach higher social participation.
- To reinforce cooperation between education and training centres and enterprises to anticipate to global changes and to detect new priorities.
- To provide training for entrepreneurs to make it possible a positive mindset towards risk taking and self employment initiatives.

Finally, the last but not least ingredient of the global innovation policies to assist regions in improving their competitiveness is governance.

### **5.7. Good governance**

In the context of the knowledge based society, the relationship between citizens and public sector must change towards a new model of governance to integrate sustainability, growth and competitiveness in the long term. This means opening up the policy making process to get more people and organisations involved in shaping and delivering European policies.

The new model of governance should be based in an active communication strategy to promote transparency and information to the general public on the new challenges of the research, technology, education and innovation policies. This will be the way to the democratization of policy making and to a better involvement of the society in the science and technology challenges.

From a regional point of view, governance is a source of competitiveness that facilitates cooperation, involvement of all partners and better processes of learning, generation, transfer and diffusion of knowledge. For this reason, regional policy shaping needs to establish partnerships to take advantage from personal and direct knowledge of institutions and enterprises to make greater use of the skills and practical experience of regional and local actors.

At the same time, this cooperation will contribute to a better coherence, flexibility, responsibility when promoting innovation. This is particularly true in the context of SMEs.

In this cooperation framework the global dimension must be a reference in looking for international partners to carry out innovation. The participation and collaboration of the private sector with the public sector is essential both in planning and in implementing policies.

In this way, policy debate will be open to the whole society facilitating different mechanisms of dialogue. Apart from the information, the aim is to promote active participation, discussion, sensibilization and mobilization of the civil society, economic actors and public institutions in the definition of policies.

Another key element for governance is efficiency. In this sense, the assessment and assistance of experts in the technology fields and areas of intervention is necessary. At the same time, evaluation and feed back will help to learn and improve future actions. As long as the policy objectives are clearer and they achieve greater

transparency concerning the different levels of intervention, national, regional or local the possibilities of learning and improvement will be greater.

To sum up, the proposal is to define a more open and democratized process of intervention, from the design of policies, to the implementation and evaluation. The bigger the transparency and the information over the whole process, the better results in collective actions and establishment of partnerships on specific targets. This is a way of enhancing the dialogue and contributing to the openness of the discussion process over the future objectives of the European policies to all the citizens, institutions and enterprises.

## **6. CONCLUSIONS**

The importance of knowledge and learning as new sources of competitiveness has pushed to all the public administrations to consider its promotion as a prior objective from the regional level to the european one. Regional administrations are closer to the enterprises, especially to the SMEs and they should play a key role in the policies of innovation, in particular in the creation of social capital, in the promotion of cooperation, technology transfer, support to new start-ups and creation of clusters of excellence to take advantage from local strengths.

As a result, considering the whole aspects of innovation, more integration of policies should be reached at the decision making and definition of policies. Systemic approach of innovation has its own implications not only in terms of actors directly involved in knowledge production, but also in the policies related to innovation, such as education, science policy, research or technology policy.

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