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Executive Summary

1.1 Objective of the deliverable

The main objective of this deliverable is to profile and understand the innovation pathways and policy challenges at the regional level that may affect competitiveness on SMEs of traditional sectors. The analysis included the main pathways for innovation in SMEs of the traditional sectors, their needs, barriers and absorptive capacity.

In short, the GPrix project wanted to answer the following questions:

- Which are the main innovation-led paths?
- What are the SMEs' needs and barriers?
- How much absorptive capacity is there in traditional sectors?

1.2 Methodology

In each of targeted regions, the GPrix consortium conducted a quantitative analysis through an *Innovation Survey* with a set of questions specifically designed to target traditional sectors. The questionnaire was intentionally design to provide comparable data across regions and taking into account the intended modes of analysis;

From the responses to the survey, the GPrix consortium was able to build a very complete data set with enough information to analyse the innovation pathways of the SMEs in traditional sectors and to understand what is hampering their innovation efforts.

Innovation Pathways in SMEs of the traditional sectors

1.3 Introduction

Traditional industries have so far played a relatively minor role in the debate of economic and innovation policy. This is commonly justified by the importance of research-intensive firms in the competitiveness of a region economy. In fact, research-intensive regions show usually better growing rates than non-intensive ones but traditional industries still have a major role to play in the regional economies and can contribute to accelerate the transition to a knowledge economy. There are direct and indirect contributions that will be detailed in the next chapters.

The overall economic value added from traditional industries in total manufacturing has decreased continuously in particular in non-research-intensive industries. However, their weight in the economic value is still quite high with an EU average of about 73%. Even in the most developed regions this proportion is still quite high (for instance, Germany with 41%), showing the relative importance of these sectors in the overall economic performance of a region.

However and despite their constant loss of weight in the regional economies, traditional industries still hold many firms and offer employment, which has great value especially in regions where unemployment is becoming a major problem. Research and innovation policies adapted to their needs can support their efforts to move in a knowledge economy era. Bringing knowledge to these SME's in traditional sectors will surely help them to be more competitive and jobs can be retained.

These facts brought an increased attention to the subject in recent years and policy makers are aware of the importance of traditional sectors in their economies and innovation system. Nevertheless, it is still largely unclear how high the actual contributions of these sectors are and in particular what are the innovation strategies and pathways available for them.

This report will try to give an insight into these pathways to provide reliable inputs to improve the efficiency of future innovation support programmes.

1.4 Innovation in traditional industries

It's not easy to classify traditional sectors in terms of research-intensiveness. Each traditional sector includes a myriad of research-intensive firms and non-research-intensive in different proportions making very hard to have a "one fits all" solution in innovation support. As a corollary of the previous, today it's not possible anymore to divide sectors between high/low tech or research/non-research intensive sectors.

Innovation in traditional industries usually doesn't follow the classical "R&D to innovation" model of innovation. They generate their own alternative strategies trying to be more competitive and creating more market impact. In this, firms tend to use the feedback of their markets/clients to select an innovation pathway, promoting mainly incremental innovation in search for competitiveness without having to engage in their own R&D. Moreover the GPrix consortium observed in the SMEs responses from the survey but also from direct contact that there's an increased attention to other forms of innovation, particularly in design and marketing innovation for whom there's a lack of public support.

However, this doesn't mean less investment in innovation but a different direction of the investments made in innovation as it is clearly demonstrated in the GPrix survey with more than half of the respondents (54%) spending more than 5% from annual turnover on innovation activities. This is a surprising figure specially because is coming from firms that are not usually considered research-intensive. Product innovation is still the most dominant innovation type, followed by process innovation. Marketing and organisational innovation came next but both are perceived by SMEs as a crucial part of their innovation activities. It's not clear if this relatively less attention to market and organisational innovation comes from the lack of available support or from a clear focus on product and process innovation on these SMEs. This aspect will be further explored throughout the project in order to identify factors that may explain these preliminary findings.

Moreover, innovation in manufacturing sectors usually requires knowledge-intensive services and even non-research-intensive firms can play an important role in the innovation capacity of the region by indirectly promoting the development of the services industry as well; The increase of demand driven and user-driven innovation and the fragmentation of value-chains in manufacturing sectors represent an increasing part (40%) of the value added in service activities.

In short, innovation is essential to the economic performance of traditional sectors and impacts directly and indirectly in the overall performance of the regional economy.

1.5 Innovation-led growth paths

SMEs play a crucial role on the regional economy both in terms of turnover as well as in employment but they are struggling to stay competitive in the global economy. Generally SMEs have common fragilities that prevent them to develop their businesses even further. Some of them are listed below:

- Insufficient knowledge of the dynamic factors that influence competitiveness (management, quality, design, innovation, training, marketing, etc).
- Difficulties in access to raw materials at favourable conditions of price and quality
- Drop of selling prices and added-value (increased competition)
- Small size of the domestic market forces internationalisation
- Even start-ups have to go international at early stage
- Technological inadequacies of processes and products
- Insufficient investment in R & D and Innovation
- Micro-size of most SMEs tempers their innovation
- Low productivity when compared to EU averages.
- Weak business cooperation

The importance of the above factors is very different from sector to sector as the incentives to support the efforts of modernization in the last 20 years were put in place. Currently SMEs present an increased use of advanced technology, better cooperation between actors, high product flexibility and all contribute to a good positioning in the international markets in some segments. This commitment to internationalization by SMEs in different sectors (particularly in the covered regions) is an important factor to face future challenges ahead.

In the current framework of fierce international competition and constant change in the global markets, particularly with the new players from Asia, the competitiveness of SMEs in the region has suffered a major decline.

The government plays a key role here and although there were interesting advances recorded in the area of streamlining bureaucratic and administrative processes, there are still some hurdles to be tackled such as much discussed labour law, one of the most rigid in EU countries, that fails to meet the needs of the current business environment.

Collaboration is another key factor for success and in this field there's still a lot to do by establishing alliances with external partners. This strategy also implies the reinforcement of the local networks to explore the dynamics of the sector resulting from a corporate structure dominated by SMEs. Through sectoral associations and clustering some collaborative lines have been explored in the last years but the more efforts are required to foster partnerships and to find common goals in order to raise SMEs competitiveness.

New Markets

Traditional industries often work in a largely saturated or even shrinking market. Not surprisingly, these industries tend to focus their innovation efforts more in product and process development, i.e., the creation of new or improved products with less resources to gain market share or enter new markets.

This "fight" for more competitiveness was tempered by the recent financial crisis as the GPrix survey clearly shows. Within the analysed period (2005-2009) that covers the beginning of the financial crisis this was rather noticeable: more than 50% of respondents said that the recession impacted negatively in mature products and only 12% see a good impact in mature products.

However, when asked to estimate the same impact in new products these figures changes completely with more than 40% of respondents saying that they didn't felt any relevant impact in these category of products. Even some of them (20%) have reported a positive impact (!). This means that innovation is still the best tool to stay competitive, particularly in recession times.

Despite these difficult conditions, firms show very high orientation to quality, adaptation of products for specific customer requirements and shortening of the lead times. This is a part a result of the price pressure induced by the fiercely competition of developing countries. Some regions are more prepared than others as this pressure is more noticeable in products with fewer added values. For instance in Portugal where traditional sectors such as textile or leather are still moving up in the value chain this pressure is much higher than for instance in Germany where products tend to incorporate the most advanced technology to reach a quality and exclusiveness that keeps the competition well behind despite having a higher price tag. The delivery of high quality and highly customized products is a trend that can be observed in all of the seven regions covered by the GPrix study. In short, they are better or faster, but not necessarily cheaper than their competitors.

Export capacity

The necessity to increase exports as one of the main strategies to promote the economical recovery of the EU is also raising attention to those export-oriented companies usually found in the traditional industries. In fact, the weight of traditional industries in exports was always and still is quite high in some regions making them an obvious choice when trying to improve the exporting capacity of the respective region. Our survey shows that over 42% of their sales are exports from which 24% for other European countries and 18% for the rest of world.

However their weight in exports has been declining in many EU regions in recent years (as opposed to the constant increase of the services sector). It becomes therefore crucial to leverage their efforts in this field by redesigning the innovation support programmes, moving from a strictly research oriented approach to a more market oriented approach that take into account not only the activities related to product development but also the subsequent phases for its commercialization.

Economic opportunities

Like other sectors, the financial crisis has also affected revenue of the traditional sectors. However, it seems these sectors show more resilience than some research-intensive sectors that suffered in some cases such high revenue losses that it may even threatened their survival in the near future. The reasons are not clear yet but maybe this as to do with fact that those sectors are more dependent on the behaviour of the financial markets, e.g., risk. On the opposite the resilience of the non-research intensive sectors towards the crisis, independently of the reason behind it, shows a very positive behaviour that should be led into consideration in future policies. Supporting these sectors could be one of the best tools to promote economic recovery and presents as such an important economic opportunity for those firms.

Not surprisingly, most of the SMEs surveyed by the GPrix project mention raising exports as one of their main strategies despite the existent risk factor of high pressure on product price coming from non-European countries. The materialization of this strategy depends on the development of new markets, especially foreign target markets, while reinforcing their presence in existing market segments. This can only be achieved but extending innovation support programmes to cover the all process of innovation from R&D to market penetration. With the right public support we can expect a substantial increase of the innovation activity in traditional sectors.

Is also important to note that most of the R&D required to create new products or introduce new processed in traditional industries comes from their suppliers, therefore the impact on the R&D intensity of a region can be much higher when considering the indirect effect it can bring to many research-intensive industries that supply the traditional industries with the high-tech equipment, technologies and services that is required for the implementation of innovative solutions. This spillover effect is another key aspect on the analyses of the impact of innovation support programmes in the R&D capacity of a region.

In conclusion, traditional sectors should not only make product innovation, process and new innovation but be able also to defend their long-term competitive position and keep expanding. Overall, marketing innovation may seem less important than research and development but it will play a key role in the future competitiveness of these firms. This cannot be perceived per se as a lower propensity to innovate by these companies but a change of their focus on the various possible innovation activities.

Barriers

From the survey it was clear that SMEs of the traditional sectors are engaged in the innovation research programs because they allow collaboration both with University and large companies on innovative projects, favouring SMEs' visibility and credibility in the market.

On the other side the specific needs expressed by SMEs in participation R&D&I support programmes are concerned with administrative and financial aspects. The complexity of administrative procedures is an issue that is often found in our analysis. It also means a greater

demand for assistance from the program managers during the implementation phase of the projects, which according to the surveyed SMEs is not adequate.

The main barriers related to the financial aspects are: lack of in-house funds, difficulties to access to external financing sources, innovation costs too high. In particular owing to the financial crisis, SMEs find many difficulties to find additional resources to cofinance research projects. This has influenced SMEs behaviour which concentrated their efforts in reducing costs.

Regional specific on innovation support measures to be considered for better structuring regional R&D&I support programmes are:

- R&D&I linkages with universities and research institutes
- Formation of new partnerships and networks
- R&D&I linkages with other business organizations
- Establishment of regional critical mass of R&D&I
- Enhanced knowledge and competences.

Cluster activation vs cluster development

Cluster development on its own is not a panacea for economic development, but a powerful tool for growth. The executive decision to be made by SMEs is not if they should collaborate but to understand how to collaborate effectively, when to collaborate, and when to compete on a local basis.

In all the 7 regions that were analysed by the GPrix project we found public support programmes to promote in a first phase the creation of clusters and in later phase to dynamize its collaboration activities.

Cluster activation is focused on removing the most serious bottlenecks for higher productivity and innovation for a cluster by mobilising the capacity of cluster participants to act jointly. This approach is driven by an underlying model of economic development that views clusters as evolving over time depending on the profile of their business environments, the current composition of clusters in the region around them, and other factors driven by location and history. Joint action can affect this evolutionary process by changing the business environment, and by creating institutional structures that help to speed up the process of cluster evolution over time.

However many studies point out the fact that government-driven clusters have generally not been successful in the second phase, probably due to the lack of an active involvement of the industry in the process, i.e., industry failed to play a key role in the establishment and operation of clusters in close liaison with government.

As a corollary of the above, public money could be spent more efficiently in activating the clusters and support their activities rather than try to run it without full commitment of the industry. In a sentence – ‘Activate clusters, do not run them’.

However, cluster policy has functioned as a catalyst to leverage broader Triple Helix cooperation. As a result, the projects may have a positive impact far beyond the specific cluster or industrial branch which is perceived as the prime beneficiary. Cluster policies can create

spillover effects and parallel structures: In fact a positive indirect effect is that today there is a general recognition among traditional industries of the need for public-private partnerships and cluster policy was one of the main contributors to this emerging innovation path. Secondly, collaboration within cluster members tend to support projects highly focused R&D and relevant sub-projects which otherwise would have encountered great difficulties in finding public financial support.

Cluster development is not only important in terms of R&D intensity of the region but has proved also a very positive effect in helping SMEs to internationalize by creating synergies among members in pursuing an internationalization strategy and by this way be more effective with less resources. As the focus moves from internal to external markets, local competition is no longer a hurdle for the collaboration between SMEs of the same sector and at the same has created an opportunity for an active collaboration in accessing new markets.

This is particularly true in SMEs of the traditional industries which are many times geographically concentrated in a specific region thus already collaborating in an informal cluster but lack the knowledge and experience to engage in more intense R&D or access new niche markets. Here cluster development policies could be the right 'umbrella' under which traditional industries could establish common goals for the sector and build a common strategy to achieve them. Clusters could provide the necessary structure and guidance for those SMEs to better achieve their innovation goals than on pure research-driven programmes that tend to restrict collaboration to one-to-one relationships scattered among several individual projects.

Absorptive capacity

The "absorption capacity" of a company describes its ability to perceive, evaluate, and exploit knowledge from the outside world to improve its competitive position. The absorptive capacity of firms in traditional sectors is directly linked to their innovation intensity both at the technological level and at the customer-relation level.

Not surprisingly, our study shows that innovation in traditional sectors shows a relatively high prioritization of product and process innovation. In fact technological development is highly relevant to their overall competitiveness and in most cases they are quite able to build a similar or even superior technology absorption capability as most research-intensive businesses.

Conclusions and policy options

Traditional sectors are characterized by a large number of SMEs, but these SMEs have many different characteristics as they operate in different business environments, using different levels of technology. These huge discrepancies among companies are also transversal across sectors, making almost impossible to have a unique solution on the side of innovation support programmes that fits all. In fact, in any of the targeted sectors it is possible to find from low-tech, family-run companies with low or even inexistent innovation activities to rather innovative companies operating in high-competitive markets and using state-of-art technologies.

In the last 30 years the traditional industries have come a long way from a low price, labour intensive operation to a high-value, highly automated industry which is capable of delivering competitive products. The increased in flexibility of the production lines and the high-quality of

goods provided brought undeniable competitiveness on a wide array of markets. However, these changes didn't happen without a cost. Many of the old traditional industries have failed to move up in the value chain and remained too much exposed to the fierce competition from Eastern European and Asian countries leading to their end. This natural selection process forced many important companies to close in recent years with the consequent loss of jobs (even more problematic as mostly of them are unqualified workers with small chances to find a new job) but, on the other side, it was this same process that fostered the required changes in existent companies and fostered the creation of many new, highly-competitive firms, capable of exploring new markets.

The firms that were able to adapt to this new globalized world, have shown that the industry is still capable of stopping degradation of jobs and become competitive. However, this battle is far from being won as competitors are also moving up in the value chain thus requiring industry leaders to keep up with these challenges. In this sense, innovation became essential for these industries and is here that public funding can play a crucial role.

It's important to note that these sectors have shown better resilience to the recent economical crises than, for instance, the sector of services. This can be explained in part by the highly exporting character of these industries and by the positive evolution of the competitiveness of these sectors. Obviously, the crisis has also affected the traditional sectors, namely by restricting the access to credit but it also shows to policy makers that these industries will have an important role in the recovery as they are the main exporters of the Portuguese economy, these industries become on the major keys to boost the country's economy.

However, this strategy will only succeed if companies receive the right support to their internationalization activities by funding those activities with a direct impact in their exports, such as supporting marketing related activities, such as product design or exploring new markets.

In conclusion, the effect of public funding focused in collaborative research and networking by supporting innovation projects with a clear focus in R&D, bringing together research institutions and traditional sectors, had a positive impact and help the industry to become more competitive, but with this being achieved at least to some extent, it is important now to complement the work done so far with specific support measures targeting those activities closer to market of the innovation process. This will surely facilitate the transition to the knowledge economy.