PILOT

POLICY AND INNOVATION IN LOW-TECH

# "Low-Tech" Industries: Innovativeness and Development Perspectives

## Executive Summary of a European Research Project

**PILOT Project Consortium**

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In the movement towards a knowledge society in the European Union (EU), the competence to generate, use and absorb new knowledge is increasingly viewed as critical for economic success and societal development. Against this background, the conventional wisdom sees so-called high-tech, research-intensive and science-based industries as the key drivers of future economic prosperity. Such industries are seen as the main source of highly sophisticated products that are not easily imitated elsewhere and, therefore, the policy conclusion is that high-cost industrialised countries should concentrate their efforts on promoting these industries. In this scenario, Low- and Medium-Low-Tech (LMT) industries are deemed to offer little to enhance prospects for future growth, and as a result, they receive less explicit political attention and support. LMT sectors comprise for the most part “mature” industries such as the manufacture of household appliances, the food industry, the paper, publishing and print industry, the wood and furniture industry and the manufacture of metal products as well as the manufacture of plastic products.

A critique of this widely held view is the starting point of PILOT, an EU funded research project. The following points provide a brief summary of the results of the project.

(1) *The project found that most growth and employment in OECD countries still emanate from so-called LMT industries.* Moreover, the firms in these industries are innovative and knowledge intensive without, by definition, engaging in R&D to any great extent, thus providing a striking challenge to currently held notions about the sources of future industrial growth. These research findings show that growth is primarily based not on the creation of new sectors but on the internal transformation of sectors that already exist. Over-emphasising the role of high-tech activities ignores this major dimension of change in advanced economies. As a corollary, in order to ensure continued future growth prospects for advanced economies, policy-makers need to focus on the processes of innovation and creativity in firms in all sectors, not just high-tech firms.

(2) The micro examples of what goes on at the level of the firm aggregate to raise serious questions about the assumed relationship between R&D and innovation at the macro level of a country or region. It is clear, then, that as an alternative to – or at

least in addition to – R&D expenditures, analysts must use other indicators of innovativeness and of the general level of technology in an economy. The PILOT project has tried to address the issue of the appropriateness of currently used innovation indicators and the conceptualisation of innovation on which they are based. *We argue that improvements can be made in the use and construction of innovation indicators. In particular, we shown that the adoption of a family of indicators rather than a composite indicator is more appropriate.*

(3) What are the preconditions for innovativeness in LMT companies? PILOT research shows that R&D in the established sense is only one and generally not the most important prerequisite for an organisation's innovativeness. Drawing on the discussion in the management sciences and economics on dynamic capabilities, a concept of innovation enabling capabilities is introduced. This concept aims at analysing the facilitating mechanisms and interdependencies between available resources and innovation results of diverse kinds. *Our analysis shows that LMT innovativeness is based on a particular enabling configuration of cognitive, financial and material (machinery etc.) resources that a company possesses.*

(4) *The project findings show that internal organisation practices - knowledge management and personnel policy - unquestionably play a vital role in this matter.* Contradicting another stereotype, PILOT research reveals that there is a variety of skill levels and forms of work organisation both among and within LMT firms in a range of sectors, rather than simply the low-skill, hierarchical model that is often assumed. *Additionally, network relations between companies and supportive social networks on a regional level are of great and growing importance as resources for firm capabilities.* Network embeddedness in various forms is becoming increasingly important for the capacity of LMT industries to act, given the growing challenges of the world market and globalisation.

(5) The project findings also emphasise that future industrial development in Europe does not depend on making a choice between high-tech and LMT industries. Rather, all these sectors are inextricably linked. *As the project findings show, interrelationships of low-tech and high-tech sectors are of major importance for the innovativeness of industry in general.* The so-called LMT industries are crucially

important as customers of high-tech sectors in developed economies. This relationship means that the continued viability of the high-tech sector is inevitably linked to the on-going vitality of LMT industries, a symbiotic relationship that is often overlooked.

(6) The policy recommendations of the project focus firstly on the specific situation of the newer member states of the EU. The project results show that the performance of these economies in general and of their LMT sectors in particular cannot be grasped without taking into account historical conditions, and especially without understanding the trauma of wartime destruction and the effects of nearly 50 years of communist policy concerning the economy, culture and morality. As the example of Poland shows, LMT industries raise many policy dilemmas. *For the countries in the study in general, policy towards innovation in LMT industries can be improved; policy needs to be tailored; policy should conform to market processes; and policy needs to be broad-based.*

(7) The research findings lead to a number of problems concerning innovation policy in the LMT sector. Several policy issues can be highlighted. *First, there is little if any awareness of innovation-supporting policies other than focusing on R&D. Second, it is an important policy task to devise measures and to support activities which aim at improving the knowledge base and the capabilities of low-tech companies. Third, policy should focus on the development of firm capabilities to meet the demands of cross-company co-operation with corresponding channels of communication, gateways and personnel responsibilities. Fourth, policies should encourage both the generation of knowledge and its diffusion between low-tech and high-tech sectors, and promote the interrelationship between the sectors.*

Finally, PILOT argues emphatically that, in spite of the doubtlessly difficult economic situation of LMT industries and the challenges of globalisation and growing competition, the future prospects of many LMT sectors and companies are bright even in high-tech countries. This is true for a number of reasons:

- Firstly, the specific competences which many low-tech companies possess cannot easily be copied by potential competitors.

- Secondly, the geographical and social proximity to markets and specific customer groups as well as the capabilities of many LMT companies to use and influence these advantages in a flexible manner, are a further important reason for the relatively favourable development perspectives and prospects of such companies.
- Thirdly, a considerable number of low-tech companies are in a position to employ high-tech process technologies systematically and efficiently. In many cases, the high-tech environment is a central requirement for the development perspectives of low-tech enterprises in this case.

These considerations should lead to a new understanding of the restructuring of the economic landscape of Europe in the early years of the 21st century. This future does not appear to foretoken wholesale structural replacement of “old” sectors with “new” ones, or a substitution of “old” technologies with “new” ones, so much as a continually changing blend of technologies of various vintages. This process of change is evolving as a restructuring of sectoral and technological systems, transformed more from within than from without. It is not dominated by industrial activities for which competitive advantage, capability formation and economic change are generated by front line technological knowledge. Rather, it is dominated by what are often wrongly termed low-and medium-tech industries. And it is unambigously characterised by the continuous combination and re-combination of high and low-tech attributes.