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The business renewal networks of VTI consist of companies, universities, and research institutes. The majority of cooperating universities and research institutes are located in Finland but some are located in the other EU-15 countries. The R&D cooperation related to integrated circuits is conducted with the same companies that currently deliver chips to VTI; consequently, the vast majority of these partners are located in the US and in Germany.

The emerging new business nets consist of organizations that participate in long-term research and development. VTI has a number of research projects targeting commercialization over the next 5 to 12 years. One example of a long-term project is the development of next-generation electric cars that utilize nanotechnology. The project consortium consists of more than 30 organizations in 10 European countries. Out of these organizations, 19 are companies, and the rest are universities and research institutes. Three companies participating in the project also belong to VTI's current demand-supply network.

During the past 15 years, the structure of VTI's demand-supply network has changed drastically. On the one hand, VTI has successfully expanded to new customer segments, e.g., in the medical equipments industry. On the other hand, although VTI's primary customers remain headquartered in Western Europe and the US, their manufacturing sites are increasingly located in low-cost countries; therefore, VTI delivers its products to these locations.

The supply networks of VTI have also changed. To reduce its dependency on sole suppliers, the company has sought secondary ones. Currently, roughly two-thirds of VTI's components and raw materials are sourced abroad (in value terms); the majority of inputs, which include integrated circuits and packages, are still sourced from the old EU members (EU-15) and the US.

During the past 10 years, the main change in VTI's value chain has been related to the geographic destination of its deliveries. In the consumer electronics segment in particular, customers are still primarily European and American companies, but now these companies have plants in China and other low-cost countries. Therefore, VTI's exports in the consumer electronics and in the automotive segments are increasingly sent to developing rather than to developed countries.

Source: Ali-Yrkkö (2009).

Does offshoring replace domestic R&D? Ali-Yrkkö and Deschryvere (2008) find that the impact of foreign R&D employment on domestic employment depends on the mode of internationalization. Moreover, manufacturing and services differ in this respect. In the manufacturing sector, the in-house *offshoring* of R&D in particular has a significant negative impact on the plan to increase domestic R&D employment. However, the relationship between the in-house *expansion* of R&D abroad and domestic R&D employment turns out to be complementary. In the service sector, it is primarily offshore *outsourcing* of R&D that has a significant negative impact on the plan to increase domestic R&D employment.

In 2008, Finnish firms had 3,600-3,800 R&D employees in China, accounting for almost 15% of the Finnish firms' R&D employment abroad (Ali-Yrkkö & Tahvanainen 2008). The study by Ali-Yrkkö and Tahvanainen (2009) showed that there have been three main motivations for R&D investment of Finnish firms to China: 1) market size and