Sectoral Innovation Watch
Retail and Wholesale Trade Sector

Final sector report

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H. Schaffers, Dialogic
L. Rubalcaba, University of Alcalá
F. Merino, University of Alcalá
S. Giesecke, ARC GmbH
P. Schaper-Rinkel, AIT
E.-J. Velsing, Dialogic
C. Montalvo, TNO
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Europe INNOVA Sectoral Innovation Watch

Detailed insights into sectoral innovation performance are essential for the development of effective innovation policy at regional, national and European levels. A fundamental question is to what extent and why innovation performance differs across sectors. The second SIW project phase (2008-2010) aims to provide policy-makers and innovation professionals with a better understanding of current sectoral innovation dynamics across Europe.

**SIW Coordination: TNO**

| Carlos Montalvo (carlos.montalvo@tno.nl) | Annelieke van der Giessen (annelieke.vandergiessen@tno.nl) |

Central to the work of the Sectoral Innovation Watch is **analysing trends in, and reporting on, innovation performance in nine sectors** (Task 1). For each of the nine sectors, the focus will be on identifying the innovative agents, innovation performance, necessary skills for innovation, and the relationship between innovation, labour productivity and skills availability.

**Sector Innovation Performance: Carlos Montalvo (TNO)**

| Automotive: Michael Ploder (Joanneum Research) | Knowledge Intensive Business Services: Christiane Hipp (BTU-Cottbus) |
| Biotechnology: Christien Enzing (Technopolis) | Space and Aeronautics: Annelieke van der Giessen (TNO) |
| Construction: Hannes Toivanen (VTT) | Textiles: Bernhard Dachs (AIT) |
| Electrical and Optical Equipment: Tijs van den Broek (TNO) | Wholesale and Retail Trade: Luis Rubalcaba (Alcala) / Hans Schaffers (Dialogic) |
| Food and Drinks: Govert Gijsbers (TNO) |

The **foresight of sectoral innovation challenges and opportunities** (Task 2) aims at identifying markets and technologies that may have a disruptive effect in the nine sectors in the future, as well as extracting challenges and implications for European companies and public policy.

**Sector Innovation Foresight: Matthias Weber (Austrian Institute of Technology)**

| Automotive: Karl Heinz Leitner (AIT) | Knowledge Intensive Business Services: Bernhard Dachs (AIT) |
| Biotechnology: Govert Gijsbers (TNO) | Space and Aeronautics: Felix Brandes (TNO) |
| Construction: Doris Schartinger (AIT) | Textiles: Georg Zahradnik (AIT) |
| Electrical and Optical Equipment: Tijs van den Broek (TNO) | Wholesale and Retail Trade: Susanne Giesecke (AIT) |
| Food and Drinks: Govert Gijsbers (TNO) |

Task 3 will **identify and analyse current and potential bottlenecks that influence sectoral innovation performance, paying special attention to the role of markets and regulations.** Specifically, the analysis will cover the importance of the different factors in the propensity of firms to innovate.

**Role of markets and policy/regulation on sectoral patterns of innovation: Carlos Montalvo (TNO)**

| Katrin Pihor (PRAXIS) | Klemen Koman (IER) |

Task 4 concerns **five horizontal, cross-cutting, themes related to innovation.** The analyses of these horizontal themes will be fed by the insights from the sectoral innovation studies performed in the previous tasks. The **horizontal reports will also be used for organising five thematic panels** (Task 5). The purpose of these panels is to provide the Commission services with feedback on current and proposed policy initiatives.

**Horizontal reports**

| National specialisation and innovation performance | Fabio Montobbio (KITes) and Kay Mitusch (KIT-IWW) |
| Organisational innovation in services | Luis Rubalcaba (Alcala) and Christiane Hipp (BTU-Cottbus) |
| Emerging lead markets | Bernhard Dachs (AIT) and Hannes Toivanen (VTT) |
| Potential of eco-innovation | Carlos Montalvo and Fernando Diaz Lopez (TNO) |
| High-growth companies | Kay Mitusch (KIT-IWW) |
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The final sector report for the retail and wholesale trade sector builds on the results of various tasks in the Europe INNOVA Sectoral Innovation Watch:


Executive Summary

Innovation patterns and innovation performance

The retail and wholesale trade sector traditionally is considered as a poor innovator. Innovation is seen as driven mostly by applications of information and communication technology (ICT). This report adopts a more comprehensive definition of innovation than the traditional one, taking into account both ICT-driven technological innovation and non-technological innovation. The report emphasizes the changing concept of the retail and wholesale trade sector which not just acts as a delivery channel of products to the customer, but forms a critical part of the producer value chain shaping producer business strategies. Furthermore, the sector is a provider of customer services connected with the products sold (e.g. warehousing, financial services) and embodies the client interface where customer preferences are shaped and expressed. Innovations mostly have the character of process and service innovations, for example new ways of selling, marketing, logistics and firm operations. The on-going transformation of the sector is demonstrated by blurring distinctions between wholesale and retail, by diversity across horizontal branches, and by a diversity of organizational and strategic concepts. In this transformation, ICT (in particular e-commerce), as well as new organizational concepts, fulfil an enabling role through facilitating the formation of client perceptions, desires and needs.

A first conclusion based on the use of traditional indicators is that, although the retail and wholesale trade sector represents an economically important activity (retail trade accounts for 13% of the value added of the EU service sector, whereas wholesale trade accounts for 16 %), the share of innovative firms in this sector is clearly less important than in the overall economy (a 24% gap) and manufacturing in particular (a 31% gap). Moreover, the expenditure on innovation in % of turnover is much lower, representing less than 35% of overall innovation expenditures in the economy. The effort on research, development and innovation is also relatively small compared with other sectors, in particular as concerns intra-mural R&D.

Within the retail and wholesale trade sector, innovation seems to be more frequent in the wholesale trade sub-sector, whereas the retail trade sub-sector shows a more modest level of innovation activities. The most common innovations in these sub-sectors are linked to introducing new or significantly enhanced support activities. Interestingly, the introduction of new or significantly improved methods of production as well as new systems for logistics and distribution is relatively widespread. These innovations are expected to considerably contribute to efficiency gains for producers and final customers.

Regarding the geographical distribution of innovative activities, it was found that companies in Southern Europe more frequently introduce innovations – in particular in the domain of supporting activities - than companies in Northern and Eastern Europe. This might well be due to the relatively high levels of expansion of the retail and wholesale sector in South Europe.

Looking at the two different sub-sectors, retailing and wholesaling, the most innovative activities can be observed in wholesale trade, especially in the area of wholesale of machinery, equipment and...
supplies (NACE 51.4) and wholesale of household goods (NACE 51.4). Also the retail trade sub-sector includes some of the most innovative activities such as Internet-based retail trade in the subsector ‘retail sale not in store’ (NACE 52.6). In wholesale trade we also find relatively higher levels of cooperation arrangements regarding innovation. However, in wholesale and retail trade, cooperation in innovation on average is about 20% less than in other economic sectors.

With respect to the innovative activities deployed by companies, it is their engagement in acquisition of machinery (mainly ICT equipment) which is the most important source of innovation both for retail and wholesale. To a somewhat lesser extent, training activities (many related to computers and software) are important as source of innovation. Less developed is R&D (both extramural and, to a higher degree, intramural R&D). This seems to indicate that innovation is part of the daily work and business environment rather than a dedicated activity.

Regarding geographical differences, companies in Northern Europe are more involved in intramural R&D than companies in Eastern and Southern Europe. These companies demonstrate a higher level of cooperation in innovation activities, and achieve relatively higher levels of training. Southern and also Eastern companies are in the forefront when it comes to relying on acquisition of machinery as source of innovation, probably because they are in a different phase of growth than Northern companies. Although in Eastern Europe the percentage of innovative firms in retail and wholesale trade is smaller, the innovative companies spend a higher percentage of sales on R&D than innovative companies in Northern and Southern Europe, which might be related to the fact that sales levels per company are relatively lower in Eastern Europe. The percentage of firms located in Southern Europe that receives public funding support for innovation is relatively higher than in Northern and Eastern Europe.

In general terms, for all countries where information was available, there is a gap of around 40-50% with respect to the use of public funding for innovation in manufacturing (50%) and overall economic sectors (38%). Further investigation is needed to understand why retail and wholesale trade companies are using less public funding for innovation than companies in other economic sectors. One answer could be that public programmes do not satisfactorily address the particular needs of retail and wholesale trade companies.

Given that the specific nature of innovation in retail and wholesale trade is mostly related to process and service oriented innovations, such innovations are less subject to patents or other types of registration. Still, the percentage of firms applying for any form of intellectual property rights (IPR) is surprisingly high: 30 % of wholesalers, 20 % of retailers, and mostly related to trademark registration. Firms located in Northern Europe are taking the lead. The gap between the use of patents in retail and wholesale compared with other economic sectors is very large: more than 50% compared to manufacturing and about 32% compared to all economic activities. This finding confirms the lack of formalisation of innovation inputs, processes and outputs in the retail and wholesale trade sector and the relatively higher importance of non-formal innovation processes.
Analysing the introduction of product innovations and process (organisational) innovations, we conclude that firms in wholesale exhibit higher levels of product introductions (to the firm as well as to the market), and also somewhat higher levels of organisational innovations than in retail. More than half of the innovative companies in retail and wholesale have introduced organisational innovations, once more underlining the importance of process and service innovations. Interestingly, Eastern European firms more often introduce products new to the market or firm, and receive a larger percentage of turnover from these innovations, than companies in Southern and Northern Europe. This could be explained by the fact that these countries are lagging behind in comparison to other European regions and depart from a less well-developed situation.

A detailed analysis based on subsectors (defined at NACE 3-digit level) shows a positive correlation between expenditures on R&D and innovation results such as intellectual property protection or introduction of new products. Besides, the most innovative sectors demonstrate better performance results in terms of employment and business creation as well as operating results and investments. Most innovative subsectors show higher productivity levels, independently of firms’ size; the available data do not confirm differences in productivity increase.

Carriers of innovation

Carriers of innovation are understood as the “conditions” that help firms innovate, including general framework conditions. It can be said that in wholesale and retail trade, humans are the main carriers of innovation. A UK study into retail innovation found that it is important to identify and support the complex set of skills for retail innovation in a more integrated way, and to stimulate, manage and sustain innovation within both large and small firms. Skills include technical skills but also skills to foster a culture of innovation and skills related to the management of innovation.

It can be expected that technological and business changes in retail and wholesale trade are ongoing. This requires more attention to occupational qualities and skills differentiation. As SMEs are dominating the wholesale and retail trade sector and have limited possibilities to address the emerging skills, more emphasis is needed on vocational training. Governments and business associations could play an important role in increasing awareness and upgrading the innovation conditions in the sector.

An important carrier of innovation lies also in cooperation and networking. Around 20 % of innovative firms in retail and wholesale have arrangements for collaboration in innovative activities, more common in wholesale and less frequent among Southern European countries. Firms in both retail and wholesale mostly cooperate with domestic partners, and especially firms active in their markets. Foreign cooperation is relatively rare, with wholesalers exhibiting a higher level. The low percentage of firms cooperating with universities and public research institutes suggests that innovations developed through such forms of cooperation are seen as less useful, or that the potential of such forms of cooperation is not yet recognised and exploited.

Carriers of innovation such as education and training for the purpose of upgrading skills, and cooperation and networking within and across the value chain, play an important role in enhancing the over-all innovation system in retail and wholesale trade. Other elements are a strong role of
government support, e.g. to stimulate cooperation in innovation as it comes to ICT-related innovation programs in logistics, distribution and Internet-based supply chains. Also, governments could increasingly act as leading innovation partners through their public procurement procedures.

Another important carrier of innovation is the organisational change of firms, using knowledge intensive services like logistics and strategic consultancy to create new comparative advantages. An example is how large multinational commercial chains adapt the vertical integration of the value added chain to multi-location production units, benefiting from global demand (e.g. Zara). Organisational changes are essential to incorporate both the use of knowledge intensive services and the effective integration of ICT as two complementary ingredients of service innovation.

**Drivers of innovation**

Drivers of innovation are understood as factors that create a demand for firms to innovate. For retail and wholesale trade, drivers of innovation can be identified according to their role on different levels. At the macro-level of generic societal developments the key driving forces are globalisation, market liberalisation, economic evolution and increasing welfare standards, sustainable development, and ageing population. These are particularly relevant to determine the playing ground in retail and wholesale trade markets: new products, services, markets and customer preferences, higher levels of competition, value chain reconfiguration and networking of firms. Examples of the impact of driving forces are the emergence of green retailing, service innovation in areas such as logistics, chain reconfiguration and e-business, but also the impact of de- or re-regulation. Also the importance of macro-level developments such as the current financial crisis is highly relevant. This has already affected the viability of the retail and wholesale trade sector, driving for cost-cutting, higher levels of operational efficiency and inviting for new business strategies.

Forces operating in the retail and wholesale trade value chain are also driving change and innovation. Many trends are affecting all the value chain segments and affect the way of doing business and interacting with customers. Such trends include sustainability, convergence, new product trends, IT-integration in all processes (e.g. RFID, supply chain management, web stores, multichannel retailing), and re-regulation (opening hours, allowance for selling medicine etc.). In retail and wholesale trade it is the continuing interaction between firms and customers at the level of mass customization, user feedback and user-generated designs which is on the forefront of continuous product and service innovation cycles.

Clearly this poses some challenges to innovation and the innovation process itself. In the first place, new innovation themes emerge, related to innovative service concepts, value chain innovation, adoption of Internet channels, supply chain management, personalised customer interfaces, RFID (“Internet of Things”) and to customer experience. It also raises the issue whether the ‘innovation ecosystem” can be further improved. This report has not looked in detail into the constituting elements of retail and wholesale innovation systems, which also strongly relate to national circumstances and to innovation in related sectors such as logistics. However, there are some common issues relevant to improving the innovation system. Analysis of the innovation climate demonstrates some relative
disadvantages regarding the retail and wholesale trade sector. The potential of absorbing innovations from elsewhere is relatively low. The low level of appropriability (e.g. the difficulty of patenting) hampers innovation activities. The climate of cooperation in innovation may be further enhanced. The dominance of large players in innovation still hampers SME-level innovation.

**Future innovation challenges**

The internationalization, concentration and differentiation of retailing is challenging the traditional retail and wholesale sector organisation and its distribution structures that firms have employed to get goods and services to market. With the intensification of competition and speed of change in the sector, retailers and wholesalers have to become responsive to consumer demands by developing and differentiating retail formats and corresponding innovations.

The focus of the analysis of innovation challenges is on the retail sector, as retailers are the link between consumers on the one side and a wide range of actors on the other side, including wholesalers, suppliers, logistics services, providers of payment systems, advertising and marketing agencies, construction services, and waste industry and recycling services. Based on an analysis of the co-evolution of demand side drivers and science and technology drivers, a set of scenarios for the possible future development of the retail and wholesale sectors are elaborated. The diversification of lifestyles, transportation costs, regulation, as well as the structure of the sector (further market concentration versus a more diverse landscape of retail and wholesale services) are considered the most interesting drivers of innovation.

We have developed five future scenarios to elaborate future innovation challenges. In the first scenario “Big Boxes Everywhere & Green Big Boxes Everywhere”, discounters, supermarkets, hypermarkets, and the retail chains are omnipresent. In the second scenario “Local Markets – connected through the web”, local markets are strongly based on products that could be produced locally. In the third scenario “The Digital Consumer” the common internal market for e-commerce is fully realized and shopping takes place through e-commerce. Providing more customer choice to meet changing lifestyle preferences is the defining driver in the fourth “The Rise of Lifestyle Stores and Malls” scenario. The fifth scenario “The supermarket as a public good” may arise if values in regard to shopping are radically changing the retail and wholesale landscape.

Emerging from the scenarios and supported by our previous observations, key innovation themes are strongly related to internationalization, changes in consumer demand and to ICT solutions related to these demands. Innovation themes are not based mostly on the technology side but are strongly related to organisational and service innovation as well. Innovation themes do not only touch the organization of retail but also the structure of the companies and of the sector. There are also some linkages to developments in the food and beverage sector, the textiles and clothing sector, the construction sector, and the optoelectronics sector. Some of the main innovation themes identified in this study are the following:
• **Sustainability or “greening”**. This is a driver for various innovative developments such as new retail formats, green and eco-efficient supply chains and logistics, smart energy-efficient buildings, innovative packaging materials.

• **Personalisation**. Enabled by ICTs and changing lifestyles, personalisation leads to innovative and customised products and services as well as organisational changes in the value chain. Mass customisation combines individual customisation and mass production.

• **Planning, logistics and organisation**. This includes product assortment planning to anticipate customer needs as well as supply chain logistics and related organisational changes across the value chain. A key technology is ICT to support efficient and adaptive logistic and planning processes, as well as product life cycle management from design to maintenance and disposal.

• **Customer relations management**. This area includes new retail formats targeting customer experience and event shopping, as well as technologies for efficient customer response. Mass customisation changes the role of consumers to co-creators.

• **ICT solutions**. Underlying most of the innovations is the role of ICT as an enabling technology. This includes ICT-based services as part of product service systems across the product life cycle, enabling efficient logistics and supply chains, and enabling customer-producer interaction and co-creation.

**Barriers to innovation**

Factors specifically hampering innovation have been identified on basis of a CIS4 survey and a complementary survey towards identification of market and regulatory failures. The majority of factors identified based on CIS4 data act as driver of innovation. As barriers were identified the “lack of demand for innovation” and, of less importance, “lack of information about competitors” and “cost of innovation”. At the level of CIS4 data, “regulation and standards” does not sufficiently explain the firm’s level of engagement in innovation.

Literature suggests that labour regulations – e.g. embodied in the flexicurity concept - as well as regulation with respect to safety and health and consumer protection have a positive effect on innovation, especially on organisational innovation. Standardisation activities such as for using RFID and for customer-driven supply chains and localisation of goods also affect innovation. The complementary survey confirms that labour regulations and regulations related to safety and health, consumer protection and standards are perceived as having positive impact on innovation. None of the studied factors was found to be a significant barrier to innovation. The complementary survey also finds a significant positive correlation between specific types of regulation and specific forms of innovation. Over-all, only a few types of regulation e.g. “Judicial and regulatory differences across the EU”, “Fiscal and taxation regimes” and “European regulations” tend to be more negative for innovation.

Regarding market factors, literature does not report any strong evidence concerning hampering factors. Market factors such as competition and globalisation are found to affect innovation mostly as driver and not as barrier. The complementary survey, however, emphasizes strong evidence of
barriers for innovation in particular regarding oil and energy prices, inputs and component prices and financial global crisis. Literature findings on the effects of the business environment on innovation suggests that availability of human resources, skills and competencies acts as innovation driver and lacking skills and competencies, absence of an innovative culture and shortage of R&D funds act as generic barriers to innovation. The survey identifies availability of funds for innovation, in-house know-how to integrate and use technologies and access to information to have the most positive effect on innovation activity. However based on the survey no general conclusions can be drawn concerning the actual existence of barriers in this respect. As a conclusion a variety of business and sector factors are found to affect innovation. Many of these factors seem to act as “enabling conditions”. This also implies that the lack of such conditions e.g. resources, skills, and innovation culture hampers innovation in concrete business situations.

In terms of systemic failures in the retail and wholesale innovation systems, little concrete evidence is found for the existence of such failures. Literature provides some observations of capabilities failure especially concerning the role of small firms that may lack the capabilities to learn rapidly and effectively and hence may be locked into existing technologies. Also there might be a case for weak network failure given the difficulty for SMEs to participate in networks for learning and innovation.

**Horizontal issues**

The two main horizontal issues of relevance to innovation in the retail and wholesale sector are organisational innovation and eco-innovation. Key ICT-enabled innovations such as using article coding, electronic commerce and supply chain management are, in order to take full advantage, strongly intertwined with organisational and process innovations that result in innovations in the retail service, in actual business practice, in distribution networks and supply chain relations including customer relations.

Eco-innovation can be considered as a key development for the retail and wholesale sector as it potentially not only relates to “green products” but also to resource-efficient processes and supply chains. An emerging innovation theme which is relevant across manufacturing and service sectors related to retail and trade, and addresses eco-innovation from product design to service delivery and disposal or recovery is product life-cycle management. Eco-innovation opportunities for the sector are partly non-technical in character as they exist mainly in making available and promoting environmental-friendly products. Wholesale and retail organisations can stimulate their suppliers to make their products more eco-friendly and to work on energy efficiency. In addition eco-innovation opportunities exist for large retail organisations in the field of packaging and waste management. Besides, eco-innovation opportunities exist in improving business processes and logistics and supply chains of wholesale and retail organisations. The challenge here is to agree on technologies and eco-innovation approaches across the supply chain and value network.

**Policy analysis and conclusions**

Whereas the wholesale and retail sector traditionally is considered as a “poor innovator” and innovation is seen as driven mostly by ICT applications, this study has adopted a more comprehensive approach.
view on innovation, taking into account process-related and organisational innovations. The over-all results of this study show a level of innovation in wholesale and retail which is not in all respects reflected by quantitative data. Also the sector shows a challenging potential for future innovation related to opportunities provided by eco-innovation as well as ICT solutions in logistics and supply chains, product life-cycle management and customer engagement. Over-all, our study has not found strong empirical evidence of factors actually hampering innovation although the existence of systemic failures regarding the role of SMEs in innovation could be examined in more detail. Rather, evidence was found regarding a large spectre of regulatory and business factors positively affecting innovation. A key challenge in this respect is to enhance the skills and capabilities of firms to exploit the opportunities of innovation, and to enhance their capability to participate in innovation networks. In this respect, more attention should be paid to education, skills and innovation culture, and innovation communities. Valuable initiatives have been taken in the UK and Ireland, which could be adopted in other countries and complemented at EU level.

This study, based on empirical evidence in relation to innovation patterns and performance as well as on future scenarios, also concludes on institutional and structural requirements underlying innovation that are giving rise to several policy issues. Two of the most important issues include the stimulation of eco-innovation and fostering of open innovation environments. Eco-innovation is recognized as a key development in the wholesale and retail sector. To become a success, eco-innovation needs stimulation of innovation capabilities across the wholesale and retail supply chain and value network. In this respect, green procurement is supposed to stimulate the demand for green products and services. By creating more demand on the public sector, a home market for such products can be created within the EU. Such procurement policies should be established at the EU level, complementing national policies. A European "home market" is very important for "greening" approaches to make the sector more sustainable.

In relation to open innovation, it should be recognized that not always strong incentives exist for companies to engage in retail and wholesale innovation, especially where innovation must be collaborative and supply chain based. As wholesale and retail firms are part of wider supply chains and networks, a policy challenge is to stimulate the participation of the innovation-prone wholesale and retail firms in large-scale research and innovation programs as promoted by EU programs such as FP7 and CIP. Examples of innovation themes that are relevant for wholesale and retail companies are mass customisation, RFID (Internet of Things), product life-cycle management, and logistics and supply chain management. EU initiatives in this respect could be complemented by national initiatives.
1 Patterns and performance of innovation

1.1 Statistical definition and sector-specific indicators

According to the European Union NACE Rev 1.1 classification, the wholesale and retail trade sector is composed of three sub-sectors:

- NACE 50: Sale, maintenance/repair of motor vehicles (not covered in this report)
- NACE 51: Wholesale and commission trade, except of motor vehicles and motorcycles;
- NACE 52: Retail trade, repair of personal goods.

The distinction between the wholesale and retail trade sub-sectors is not always very clear. Firstly, examples exist of retail companies that integrate wholesale and even design and production activities. Supermarkets are an example hereof (Creusen et al., 2008). Many supermarkets have their own private buyer groups. This integrates the chain from buying from manufacturers, to distributing, to retailing. Other, more extreme, examples are Ikea and Zara, where even design and production is executed by the company itself. Another illustration of this duality is the ‘private label strategy’, a strategy where retailers transform their labels into brands and where, as a consequence manufacturers have to compete with their customers (Kumar and Steenkamp, 2007). Secondly, manufacturers extend their activities downwards (Nielson 2000). Shiseido, Estee Lauder and L’Oreal have been opening shops to be able to compete with the retailers ‘private label strategy’. Similar activities can be seen in services, where for instance mobile telephone companies operate their own shops and the German Metro-Group that is both active in the retail and wholesale industry. Because firms are often adding new activities, or discontinuing existing activities (Nielson, 2000), it is hard to specifically sub-categorize the sector. Though, a lot of companies still can be classified as wholesale or retail trade. A second problematic characteristic is that while horizontally one can speak of a wholesale and/or retail sector, when viewing vertically, a lot of differences exist between different branches. Especially when focusing on the specific features of the different products of services; it is difficult to compare a greengrocer to a hairdresser as they have to cope with different customer preferences and different changes in product or service possibilities. Still, considerable similarities exist, for example concerning the role of ICT in business processes. This report recognizes the sometimes difficult distinction between wholesale and retail trade as distribution channels and the particular characteristics of the sub-sectors. Whenever appropriate, in the following we describe the characteristics for the two sub-sectors separately, keeping in mind the similarities and differences.

1.2 Characterisation of the sector

1.2.1 Nature and importance of the sector

Although retail and wholesale trade is one of the oldest economic activities, economics literature pays relatively scarce attention to it. Traditionally, the retail and wholesale trade activity was defined as “the set of tasks that are inherent to buying goods or services in order to re-sell them with some margin that covers the financial costs and risks in the operation”. However, as production has increased and markets have changed, retail and wholesale trade is now considered a proper economic activity with
some specific characteristics that require to be studied as any other activity. Besides, this activity develops valuable functions to producers and customers of the intermediate goods and services. Consideration of retail and wholesale trade as an economic activity leads to an analysis of the economic role, perspective and significance of this activity. New technological, managerial, organisational innovations are changing the available options for agents in this activity. As the environment and the technological options become more complex, specialised agents may find their place in this market. Additionally, the outsourcing processes that firms in other sectors develop increase the market potential for firms in the retail and wholesale trade activity. The conjunction of these factors delimitates the kind of activities that the retail and wholesale trade activities will include, beyond what external observers may determine. This can be observed in the examples of warehousing or financial services. Although external observers do not consider these activities as part of retail and wholesale trade activity, in many cases they go hand-in-hand with it and companies active in that business are continuously expanding such business activities.

Retail and wholesale trade activities should not only be considered as a service delivered to customers. They are part of the producer value chain, since these activities are the final step allowing their output to become part of the market supply. Without them, the good or service will not be accessible to potential customers, and producers will not have generated value on their products. As a part of the producer value chain it becomes essential for business strategy and activities coordination. A careful choice concerning how this activity will be provided - whether internal or by external agents, and selection of agents, as well its management becomes essential. Wholesale and retail trading activities should thus be considered as a business service that producers need to incorporate to acquire the revenue of their outputs, and necessary to create the value added in other parts of the value chain. Porter, 1980 describes how the company’s value chain is embedded in a larger stream of activities, the “value system”, which includes wholesale and retail channel activities (figure 1.1).

![Figure 1.1 Value chain and value system concept](image)

Source: Porter (1980)

Many linkages exist among the set of activities in the firm value chain and across the value system connecting activities between a firm, suppliers and wholesale and retail distribution channels, including financial, logistics and marketing activities, but also product design and technological development to the extent that the channel activity generates flows of information about customer tastes and preferences that are valuable for the producer. Thus, contribution of wholesale and retail activities to
the total process is not limited to the disentangled activity but includes the provision of valuable information to the other parts of the value system.

From customer service perspective, wholesale and retail trade adds value thanks to the availability (spatial, temporal and assortment) added to the product. In advanced economies the distance between producers and customers reduces the value of the product in the market. Thanks to the activity of traders and retailers that product can be offered in a market. For this reason, wholesale and retail trade includes some kind of change in the spatial and temporal location of the good from wherever it was produced to wherever the customer desires to have it. It also entails some psychological transformation thanks to the way the goods are presented, the assortment to compare with, the other goods or services that are jointly sold, etc.

A wider and probably more adequate concept of the wholesale and retail trade activities refers not only to delivery of a good or service but also to the value created in generating information for the whole value chain of the producer and to the added value for the customer of incorporating the good or service in a larger assortment (from the same or other sectors) and making it available in a certain place, time and form. In conclusion, wholesale and retail trade activities can be analysed from three different perspectives: as an economic activity; as a service for producers that is part of its value chain as well; and, finally, as a service for customers thanks to the transformations mentioned.

### 1.2.2 Sector characteristics

Retail trade covers the resale without transformation of new and used goods to the general public for personal or household use and consumption (Eurostat 2009: 104). Various distinctions can be made; for example between non-specialized and specialized retailers; between food and non-food retailers, between in-store and other retailers (e.g. markets, door-to-door, remote); and between new and second hand goods. From a historic perspective, retail - for example in food - has gone through four stages (according to Bell, 2000): The consumer co-ops were organized on a regional basis within a country. In order to increase their buying power retailers have established chains and in the long run they were able to gain large market shares. In a second phase, large retail formats emerged across Europe, initially in Belgium, followed by France, Spain, Portugal and the UK. Large surface resulted in a crowding out of small neighbourhood stores and in the decline of downtown supermarkets. Phase three is characterized by advanced distribution systems by the large integrated retailers. Introduction of the scanning system provided the necessary information to reverse the supply chain from ‘producer push’ to ‘consumer pull’. As a consequence the number of traditional wholesalers declined, in the end at the expense of small retailers. Finally, in phase four, we see the emergence of retail chains as national brands in their own right, moving away from head-to-head price competition to a differentiation strategy based on availability, service, store format and location.

The retail sector’s main function is to pass small quantities of goods to final consumers. For this reason retail enterprises are prevailing in society, fulfilling an important role as a connection between industry and society. It is through shops that people get in contact with products and services, both in the street, by traditional mail-orders, and on the growing online marketplace. The sector’s focus is on
all consumers, meaning all the 27 EU countries’ inhabitants: nearly 500 million in 2009 (Eurostat, 2009). In terms of value added and employment, retail trade is one of the bigger sectors in the European Union. In 2005, the sector accounts for 13 per cent of the value added of the EU service sectors, and 22.5% of people employed in this sector (Alajääskö, 2008), which equals over 17 million people. Figure 1.2 shows that retail trade and repair of personal and household goods have shown a steady growth over the last years. Only specialised in-store retailing shows a considerable decline in volume of sales (Alajääskö, 2008). Development in the retail trade sector is closely related to economic welfare and development. The recent decline in the economy has already had an influence on the volume of sales and added value in the sector.

**Figure 1.2 Retail trade volume of sales index, EU-27 (2000=100)**

As well as in the wholesale sector, enterprises in the retail trade sector are mainly small, many even with no personnel. Looking at the share of value added, this is mainly composed by large companies, above 250 persons employed, over 42%, and micro companies, less than 250 persons employed, over 32% (Eurostat, 2008). These small companies generally cannot cope with large investments. Therefore, competing with larger firms is very difficult. This is an expanding problem, considering retailing colossus like Wal-Mart, Tesco, Metro Group. Although this is also a social and employment problem it is an advantage for consumers and competitiveness.
The wholesale trade sector is composed by enterprises selling to retailers or industrial, commercial, institutional and professional users (figure 1-3, Eurostat, 2008). These companies are an intermediary between producers and their customers, adding value through for example logistics, know-how, and pre- and post-production operations. Typically wholesale enterprises compete on improving the added value process and doing business more efficient. In the EU service sector, wholesale trade accounted in 2005 for 16% of the value added of the service sector (Alajäskö, 2008). Figure 1.3 shows the volume of sales index from 1996 until 2006. Within this sector wholesale companies employed in 2005 12.8% of the workforce. Noteworthy is that these people account for more value added than the nearly double amount of people working in retail (see previous paragraph: retail trade). By far the biggest sub sectors are wholesale of consumer goods, intermediate goods and machinery and equipment (Alajäskö, 2008).

**Employment specialisation differences across EU countries**

Differences between the European countries do of course exist. What is explicit for both the wholesale and retail trade sector is the relative small difference in employment specialization (Eurostat, 2008). This is not surprising, because the wholesale industry supplies goods and services to consumers and industry, which exist in all regions. The same accounts for the retail sector (Eurostat, 2008). Considering wage ‘adjusted labour productivity’, in the wholesale sector particularly Central European and Baltic states stand out (Eurostat, 2008). This is mainly because of the lower wages in these new EU entrants. For the retail trade and repair sector these countries don’t stand out that clearly (Eurostat, 2008). Here, well performing countries are also Ireland, the Netherlands, Luxembourg and the UK. More clear differences can be observed when considering market share of the largest companies. In the Scandinavian countries and Austria the three largest retailers show a market share of around 80 %. In the Czech Republic, Hungary and Italy this share is only around 30 %, in Poland even just 16 % (AC Nielsen 2007, cited in Finne and Sivonen, 2009).
Key figures retail and wholesale trade

Average annual growth rate of turnover for wholesale trade in the EU-27 from 2002-2007 was somewhat higher than 6% (almost as much as transport/communication and computer services/other business which are on top of the service statistics). The figures for retail are lower: ca. 3.6% (Eurostat 2009). Retail trade has a particular importance for economic statistics because of its interface role between producers and final customers. This allows retail sales turnover and volume of sales indices to be used as a short-term indicator for final domestic demand by households. Such short-term indicators are highly important for policy making. Eurostat distinguishes between retail turnover in value and volume. Volume statistics eliminate price effects. Over the last ten years, a continuous increase in volume of sales can be observed (Eurostat 2009). However, the latest short-term indicators (2008, 2009) have shown a dramatic decline in demand due to the economic crisis.

Based on Eurostat figures of 2008, wholesale and retail are among the most important sectors in terms of share of value added and employment in the EU27. More than 13% of the employees in the EU work in retail. In wholesale, the share is about 8%. In retail, micro enterprises, defined as employing less than ten people, play a particularly important role and account for the majority of companies. More than half of these enterprises employed only one person in 2005 (European Communities, 2009).

In retail trade, most value added is generated by large enterprises (about 35%), followed by micro enterprises (about 30%). This is a very high figure compared to the other sectors. Only in 1990, there were no retailers among the Fortune 500 largest global companies. Ten years later there were over 50, and in 2002 Wal-Mart became the largest of all companies (by turnover). In only two years, between 1996 an 1998 retailer’s share of revenues among the top Fortune 500 increased by over 25% and their share of total assets doubled (Gestrin, 2000 and Reynolds, 2004). These figures show that there is an enormous concentration process going on, at the expense of the small and micro retailers. Value added in wholesale is more evenly distributed among the four size categories of enterprises. This is very unusual for the other economic sectors where large enterprises usually dominate (Eurostat 2009).

As shown in figure 1.4, labour productivity in retail and wholesale ("distributive trades") is relatively low, especially in micro enterprises. These findings already take into account one of the major drivers of the sector. Especially in retail, there is a lot of pressure on costs, leading to larger and more efficient sizes of enterprises whereas micro business can only survive if they are maintained by a family and/or where working hours do not cause high costs (Eurostat 2009).
Figures from 2004 show that the wholesale and retail trade sector accounted for approximately 6 million enterprises in the EU15. The sector generated a total turnover of €7,140 billion in the same year. Labour statistics from 2006 show that the sector provided 33.3 million jobs, of which 80% were located in the EU15. Employment in the sector grew with 2.4% annually in the period 2000-2004 in EU15. Value added amounted to EUR 1,352 billion in 2006 (Van der Giessen et al. 2009). Wholesale and retail trade is a low-pay sector, with substantially lower wages than in the manufacturing sectors. Moreover, women earn 20 to 30% less than men. In the sector, 33% of the employees works as a service worker, followed by clerks (13%) and managers of SMEs (11%). The share of service workers reached even 47% in the new Member States (Van der Giessen et al. 2009).

Retail is the biggest sub-sector in terms of number of firms (3.7 million, 60% in 2004) and employment (55%), but wholesale is the biggest in terms of turnover (55%) and value added (46%). Almost half of all firms in retail were small or micro firms, with less than 50 employees. In 2006, 18.5 million jobs existed in retail, constituting 85% more than in wholesale (55.4% of the total number of jobs in the sector). Employment in retail grew with 2.3% annually in the period 2000-2006. It employed 17.14 million people in 2005 (almost twice as much as in wholesale); of which 79% were employees and 21% were entrepreneurs. The share of part-time jobs amounted to 30%. The retail sector has a high share of 62% women employed (Van der Giessen et al., 2009).
Wholesale accounted for 1.7 million enterprises in 2004, covering 27.2% of the total number of firms in the business sector. Statistics from 2006 show that there were 10.4 million jobs in wholesale (31.1% of the total number of jobs in wholesale and retail trade). Employment in the wholesale grew with 2.1% annually in the period 2000-2006. Wholesale employed 9.72 million people in 2006, of which 86% were employees and 14% were entrepreneurs. The share of part-time jobs amounted to 10%. Men represented two-thirds of the workforce in wholesale and more than half of the persons employed were aged between 30 and 49. The wage adjusted labour productivity in wholesale amounted to 157.6%, which is higher than the non-financial business economy average (van der Giessen et al., 2009).

A key driver in improving competitiveness and productivity is the cutting of personnel costs, mainly by increasing labour flexibility. The retail sector has a relatively young workforce with 30% aged between 15 and 29 and half of the employees aged between 30 and 49. Nevertheless, the workforce is ageing. Retail has a relatively low trade union density. In general there is a strong social dialogue between social partners, although there are several large-scale retailers that resist this. Important issues are deregulation, opening hours, labour flexibility and gender inequality (Van der Giessen et al., 2009).

In the Eastern European states the development of the retail sector was quite different. These countries have seen 50 years retail development in just 15 years. The retail business has experienced an unprecedented growth in this region as consumers demanded to catch up with consumption in the West (KPMG, 2006: 3).

1.2.3 Characterization of innovation in wholesale and retail trade

In-depth studies of innovation in retail and wholesale are very scarce. One of the few available studies studying characteristics of retail innovation is Hristov and Reynolds, 2007, who explored innovation in the UK retail sector and suggested five particular features of innovation in retail organisations:

- **Retailers as Innovation hubs.** Many of the large (multinational) retail companies occupy central positions in the supply chain. This position and their size enable them to innovate on the supply as well as on the demand side, by intermediating in the value chain and diversifying into areas such as financial services, utilities and travel, and thus increasing efficiency of market exchange.

- **Low appropriability of the retail environment.** Innovations in a retail environment are easily copied. This underlines the need to continuously focus on incremental opportunities for innovation and rapid scaling up towards profitability, or to exploit economies of scale, to keep a hold on the market and stay in front or at least at the same level of competitors. Hristov and Reynolds, 2007 cite Tesco for their approach “start small, scale up, think big”.

- **Pre-dominance of non-technological innovation.** Retailers do not primarily focus on technology when considering innovation. Emphasis is mainly on marketing methods, adding service, and/or price reducing. Technological features of products and services are also important, as well as ICT as an enabling technology (for example for price reduction due to efficiency benefits), but the central issue remains ‘how to sell’.
• **Hybrid characteristics of retail innovation.** Vertically integrated retail enterprises such as Zara play on different levels. For this reason they experience the need to innovate on these diverse playing fields. Retail innovation therefore displays hybrid characteristics deriving from the demands of these playing fields, sometimes behaving like manufacturing innovation processes, sometimes behaving more experimentally, non-linear and ad-hoc.

• **Reverse innovation cycle in retail.** In retail new ideas are often first tested on a small scale and low cost. When proven to be a success they are rolled out, which often requires considerable innovations in organisation and process. New concepts may take up even to ten and more years to be rolled out. This situation is different from product development in manufacturing, where the initial investment in R&D is high, leading rapidly to large scale implementation necessary for generating a satisfactory level of profit.

Finne and Sivonen, 2009 discuss in detail the process of developing efficient consumer response strategies for gaining competitive advantage in retailing, but provide only limited information about the role of innovation in retail. Also for wholesale trade, literature search provides only very limited results in terms of recent systematic studies of innovation. A report from Accenture 2007 about achieving high performance in wholesale distribution relates more to strategy and business models, given the threats of disintermediation, than to innovation. An OECD report on wholesale trade (Nielson, 2000) discusses the sector definition, changing structure, economic importance, and measures restricting trade as well as liberalisation opportunities but does not address innovation except the role of electronic commerce. Quinn and Sparks (2007), in their introduction to a special issue on research frontiers in wholesale distribution, again look into the changing patterns and realities of wholesale distribution driven by factors such as globalisation and ICT. Clearly, “change” in the wholesale distribution sector is a dominant theme, as markets have changed and roles of actors as well. Traditional activities of wholesalers are increasingly seen as just one of the functions that may or may not be undertaken in the wider supply chain. This would also imply that innovation issues should be studied more and more within the scope of supply chain management.

**The nature of innovation in retail and wholesale trade**

The classical approach in defining wholesale and retail trade activities is in terms of buying goods or services in order to re-sell them to whoever wants to pay for them (being a final client, or another firm that will incorporate it into its production process). As the output of this activity is defined, it seems that there are less opportunities to innovate (in products) than in other sectors such as pharmaceuticals or machinery where the development of new drug or engines presupposes product innovations. In wholesale and retail trade activities, the identification of “product innovation” is more difficult and will be linked to the perception the firm or customer has on what he receives from the trader. For example, as retailers add value for customers, offering at the same time and place items of different producers, a “product innovation” could be a new design of the assortment of goods and services that a trader offers to his potential customers, generating some competitive advantage. To develop this kind of product innovations will not demand results that can be patented (this point is from the long discussion of using the number of patents as an indicator of innovation, see Griliches, 1990). In many cases the expenditures for the firm in designing alternatives, evaluating them, and apply a strategy to enforce
them will not be considered under the category of “R&D expenditures”. Thus, we conclude that the traditional measures of innovation will miss important elements regarding the wholesale and retail trade sector.

There are also special characteristics regarding process innovation. In manufacturing, process innovation clearly focuses on the development or introduction of new ways to generate products or services, based on the use of new machinery or technologies. Although in the wholesale and retail trade activities these possibilities also exist (e.g. the emergence of e-commerce and electronic systems to track goods, as well as web-based systems that can be used to elicit customer preferences), many of the changes in the production process will take place in the internal organisation (such as the role of each department/employee, the channels for information flows, etc.).

In wholesale and retail trade (as in many other service activities) human activity plays a more important role than in manufacturing, since its weight is larger in the added value of these activities, and customer relations activities acquire more importance. A large part of the development and adoption of process innovations specific to wholesale and retail trade activities will not be translated into patents, R&D expenditures or any of the other classical indicators of innovation.

Several factors can be identified that restrain firms to develop innovation strategies that may acquire special importance in the wholesale and retail trade sector. Such elements are the difficulty of patenting some of the innovations, the possibility of being copied by other firms (see Kanwar and Evenson (2003) who evaluate empirically the effect of the appropriability possibilities on technological change). The fact that a large part of this sector consists of SMEs or micro-enterprises contributes to low efforts in innovation given the high fixed costs of innovation. This means that venture capital companies (whose role to promote innovation is well known, see Callahan and Muegge, 2003) are more reluctant to participate in these firms, or that specific difficulties to absorb external knowledge exist (Mayor and Cordey-Hayes, 2003).

1.3 Common set of indicators

1.3.1 Introduction

Notwithstanding the economic importance of the wholesale and retail sector, its share of innovative activities is relatively small. R&D in wholesale and retail trade activities is mainly focused on process innovations across the supply chain, on researching consumer trends and on developing new services that add value to the customer. In particular larger companies dedicate their R&D efforts to developing new processes and technologies related to, for example, more efficient supply chain management, tracking and tracing (Radio Frequency Identification), pricing devices on shelves, and electronic commerce. So, even when we are studying an important sector whose spillovers affect many related activities, the sector in itself represents a low intensity in their innovative activities according to the main traditional R&D and innovation indicators.

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1 Beyond the effects that firm’s structure and organisation may have on achieving a more efficient production process for a firm, recent research (Bloom et al., 2007) shows that an adequate organisation and structure amplifies the effects of IT on firms (Galende and de la Fuente, 2003) on the total innovative behaviour.
This report analyses the innovative activities of the wholesale and retail trade activities based on the Community Information Survey (CIS-4). The information has been collected from two different sources. The first one is the Eurostat website, which distributes information on aggregate terms of some of the variables captured in the survey. In this case, the information refers to the average value of the 27 EU member states. However, in some cases, there is no information from some of the member states due to different reasons (confidentiality, lack of data collection, etc.). In these cases, the figures refer only to the subset of countries where information is published by Eurostat although in the tables the label remains EU. Although the analysis for the whole section G (Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods) is based on information from most of the EU member states, a more detailed analysis for divisions G50-52 shows that information at that level is not available in most of the member states. In these cases and in some other characterisations (countries) we have used the information that Eurostat distributes through the second source: the Eurostat Safe Centre in Luxemburg. However, in this case in order to observe the confidentiality requirements of Eurostat, some of the analysis have faced some restrictions such as the exclusions of countries and subsectors where the number of cases were too low.

The analysis has differentiated three sectors in the G division, on the basis of the statistical classification. From now on, they are labelled:

- **Motor**, for division 50 (Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel); as mentioned this category is excluded from the present study;
- **Wholesale**, for division 51 (wholesale trade and commission trade, except of motor vehicles and motorcycles);
- **Retail**, for division 52 (retail trade, except of motor vehicles and motorcycles; repair of personal and household goods).

Some of the analysis will go to a more detailed level of sectors, but in all cases follow NACE rev. 1.1. In those cases, the proper names of the sectors will be indicated. Besides this, in order to develop some geographical analysis that might illustrate some differences across the EU, we will present information in that way. Notwithstanding this, given the number of covered countries, tables could be too large, little informative and generate problems to keep the privacy requirements. We have grouped the member states in three regions:

- **North**, formed by Sweden, Finland, Denmark, Luxemburg and France
- **East**, formed by Czech Republic, Slovakia, Hungary, Slovenia, Romania, Bulgaria, Estonia, Latvia, Lithuania
- **South**, formed by Spain, Portugal, Greece and Italy.

Some countries are missing (UK, Ireland, Germany, Austria, Belgium, The Netherlands, Poland, Cyprus, and Malta) due to lack of data. Finally, it must be said, that the information presented in tables refers to different populations of firms (in any case, the tables clearly indicate that). The reason is the object of analysis as well as the existence of missing values in some of the used variables.
1.3.2 Data analysis

Innovative activities

Table 1.1 reports the kind of innovations that firms of the different sectors of wholesale and retail trade have introduced, according to the results of CIS-4.

Table 1.1 Innovation in wholesale and retail trade

<table>
<thead>
<tr>
<th>Number of observations (thousands)</th>
<th>Motor</th>
<th>Retailing</th>
<th>Wholesale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any innovation</td>
<td>24.5%</td>
<td>18.8%</td>
<td>32.6%</td>
</tr>
<tr>
<td>A new or significantly improved good</td>
<td>6.7%</td>
<td>4.2%</td>
<td>13.4%</td>
</tr>
<tr>
<td>A new or significantly improved service</td>
<td>9.3%</td>
<td>5.0%</td>
<td>10.2%</td>
</tr>
<tr>
<td>A new or significantly improved method of production</td>
<td>8.4%</td>
<td>6.4%</td>
<td>9.7%</td>
</tr>
<tr>
<td>A new or significantly improved logistic, delivery or distr. system</td>
<td>7.1%</td>
<td>7.9%</td>
<td>12.6%</td>
</tr>
<tr>
<td>A new or significantly improved supporting activities</td>
<td>14.0%</td>
<td>11.1%</td>
<td>19.6%</td>
</tr>
</tbody>
</table>

Enterprise with on-going or abandoned innovation activities | 4.2% | 4.1% | 9.6%

Source: CIS-4

As was expected, the most common types of innovation in these sectors are the ones linked to the introduction of new or significantly improved supporting activities. As it was discussed previously, many of the changes in this activity, that properly could be defined as a modification of the output (as it happens for any change in the way an item is sold in of retailing), will not be identified as a product/service modification, but in a different way. Many of the additional services and activities that are bundled into the selling activity are considered as “supportive” activities for those sectors and as such identified in this class. Beyond that, it is interesting to see how the introduction of new or significantly improved methods of production (of the trading activity) as well as logistic and delivery of distribution systems is relatively common since these changes will contribute to efficiency gains that will revert to producers and final customers. In general, wholesalers’ shipments are larger than those of retailers due to the nature of the activity which is mainly focused on a broader market. It is well established in the literature that innovation is most common among larger firms and we can expect that the size-effect introduces some differences between wholesalers and retailers. Besides this the market of wholesalers covers a larger territory. The possibilities and potential profits of innovation in logistics, customers’ attendance, etc. will be larger too. Therefore, we can expect that innovation will be more common for wholesalers than for retailers. In any case, it must be noted that the current integration of the wholesaling activity by some large retailers (such as the chains of hypermarkets) also provides some of the attractiveness of innovation to firms classified as retailers. As we can see from table 1.1 wholesalers are more innovative than retailers, with more common innovations in supporting activities. Furthermore, table 1.2 shows that wholesalers are more involved in both intramural and extramural R&D activities and in all the kinds of innovative activities that are considered.
Table 1.2  Innovative activities that wholesale and retail trade firms carry out (only for innovative firms)

<table>
<thead>
<tr>
<th>Innovation indicator</th>
<th>G - Wholesale and retail trade (1)</th>
<th>G50 - Sale, maintenance and repair of motor vehicles (2)</th>
<th>G51 - Wholesale trade and commission trade (3)</th>
<th>G52 - Retail trade (4)</th>
<th>MANF GAP(*)</th>
<th>TOTAL GAP(*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of innovative firms</td>
<td>25.86%</td>
<td>20.49%</td>
<td>31.66%</td>
<td>21.17%</td>
<td>-31.19%</td>
<td>-24.27%</td>
</tr>
<tr>
<td>Firms innovation expenditure (% turnover)</td>
<td>0.98%</td>
<td>0.26%</td>
<td>1.13%</td>
<td>0.58%</td>
<td>-73.41%</td>
<td>-64.12%</td>
</tr>
<tr>
<td>Firms engaged in intramural R&amp;D</td>
<td>28.27%</td>
<td>29.38%</td>
<td>31.15%</td>
<td>35.22%</td>
<td>-44.02%</td>
<td>-35.13%</td>
</tr>
<tr>
<td>Firms engaged in extramural R&amp;D</td>
<td>20.69%</td>
<td>19.08%</td>
<td>21.24%</td>
<td>21.91%</td>
<td>-5.00%</td>
<td>0.09%</td>
</tr>
<tr>
<td>Firms engaged in acquisition of machinery, equipment and software</td>
<td>69.70%</td>
<td>68.86%</td>
<td>70.40%</td>
<td>76.30%</td>
<td>-10.46%</td>
<td>-6.50%</td>
</tr>
<tr>
<td>Firms that received any public funding</td>
<td>13.26%</td>
<td>8.71%</td>
<td>14.46%</td>
<td>10.58%</td>
<td>-50.84%</td>
<td>-38.36%</td>
</tr>
<tr>
<td>Sales of new or significantly improved products not new to the market (% turnover)</td>
<td>2.64%</td>
<td>3.12%</td>
<td>3.05%</td>
<td>1.88%</td>
<td>-68.49%</td>
<td>-58.95%</td>
</tr>
<tr>
<td>Sales of new or significantly improved products new to the market (% turnover)</td>
<td>2.86%</td>
<td>5.11%</td>
<td>3.09%</td>
<td>2.89%</td>
<td>-71.67%</td>
<td>-61.79%</td>
</tr>
<tr>
<td>Firms engaged in any type of cooperation</td>
<td>27.95%</td>
<td>33.38%</td>
<td>28.81%</td>
<td>27.52%</td>
<td>-18.97%</td>
<td>-18.04%</td>
</tr>
<tr>
<td>Firms that applied for a patent</td>
<td>7.18%</td>
<td>3.09%</td>
<td>8.34%</td>
<td>3.66%</td>
<td>-50.45%</td>
<td>-32.06%</td>
</tr>
</tbody>
</table>

Source: Based on CIS-4 database, Eurostat.

Note1: Figures refer to average values for EU27, except for: Germany, Estonia, Ireland, Greece, Latvia, Austria, Finland and United Kingdom.
Note2: Figures refer to average values for Belgium, Czech Republic, Spain, France, Italy, Lithuania, and Slovenia.
Note3: Figures refer to average values for EU27, except for Ireland.
Note4: Figures refer to average values for Belgium, Czech Republic, Denmark, Spain, France, Italy, Lithuania, Portugal and Slovenia.

(*) Manufacturing and total CORE gaps have been evaluated in comparison to the aggregated sector G for those countries included in Note1.

The second most frequent activity is linked to training. This result should be expected because in services, the role of the workforce skills is more important than in manufacturing, meaning that a larger part of the added value is generated by labour. Furthermore, over 70% of the workforce is engaged in machinery acquisitions in order to innovate which requires specialised training to use it adequately.

Concerning the intra/extramural R&D activities, it appears that there are important differences between the three subsectors. The trading activities related to motor/vehicles activities exhibit small percentages of firms developing R&D activities. Secondly, it must be noted, that in all the subsectors firms prefer to develop R&D in-house instead of externally, although differences are important across sectors. The smallest difference exists in the motor/vehicles subsector, which may be explained by the special nature of this trading sector whose firms hold close linkages with the manufacturers of the goods they sale. Although it is composed of a set of firms that develop this activity, their linkages with the manufacturer of the good (carmakers) are closer than in other goods such as food, and house appliances. This is why a large part of the innovation effort in this activity will be developed by the proper producer of the good and not by the specialised firm on trade. Furthermore, the fact that this
subsector shows the highest percentage of engagement in training reinforces the above assumption, since employees must learn the innovations that the manufacturers have developed.

In consonance with the most innovative behaviour of wholesalers, cooperation with external agents to develop innovative activities is also larger. Almost one fourth of the wholesalers that innovate have arrangements to cooperate with third agents. This could have different meanings: there could be lack of necessary resources to develop the innovative activities in-house, or there are attractive partners that may add value to the innovation strategies of these firms.

The 3-digit based information in figure 1.6 shows that the most innovative activities lie in the wholesale trade, especially in activities in 51.8 (wholesale of machinery, equipment and supplies) and 51.4 (wholesale of household goods). It is noteworthy that sector 52.2 (retail sale of food, beverages and tobacco in specialised stores) is one of the less innovative sectors, but it must be remembered that supermarket and hypermarket chains belong to subsectors 52.1 (non-specialised stores) or 52.4 (other). Subsector 52.6 (retail sale not in stores) where sales by mail, the internet and other similar procedures are included, is one of the most innovative ones, as expected.

**Figure 1.6 Percentage of firms that introduce innovations in wholesale and retail trade**

Source: CIS-4
Factors preventing innovation

In wholesale and retail trade activities, as in any other sector, firms face difficulties in innovation due to cost factors, knowledge of opportunities and market factors. A priori, wholesale and retail trade firms should not have special difficulties in innovating compared to firms in other sectors. The fact that many of their innovations are concentrated on the way they market the products (and not in designing new goods to offer to the market) should reduce the costs of innovation compared to manufacturers. Table 1.3 presents the main factors indicated by firms to hamper their innovative activities. As it can be seen, the firms in wholesale and retail trade activities attach less importance to cost factors, while the factors linked to lack of general knowledge or the market opportunities are similar to the rest of the economy. A more detailed analysis confirms that there are differences between wholesalers and retailers: for retailers the cost factors are more important than for wholesalers, which is also the case with general knowledge. An exception is knowledge about market opportunities where their proximity to the customer would be an advantage.

Table 1.3 Factors preventing innovation

<table>
<thead>
<tr>
<th>Costs</th>
<th>Distributive Trade</th>
<th>Motor Vehicle</th>
<th>Whole Sale</th>
<th>Retail Industry</th>
<th>DT-Total gap</th>
<th>DT-Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise with inn. activity abandoned at the concept stage</td>
<td>11.4%</td>
<td>6.6%</td>
<td>14.0%</td>
<td>10.4%</td>
<td>-6.0%</td>
<td>-7.2%</td>
</tr>
<tr>
<td>Lack of funds within your enterprise or enterprise group</td>
<td>17.6%</td>
<td>21.4%</td>
<td>15.5%</td>
<td>17.6%</td>
<td>-2.9%</td>
<td>-5.0%</td>
</tr>
<tr>
<td>Lack of finance from sources outside the enterprise</td>
<td>12.9%</td>
<td>14.9%</td>
<td>12.1%</td>
<td>13.2%</td>
<td>-3.1%</td>
<td>-5.0%</td>
</tr>
<tr>
<td>Innovation costs are too high</td>
<td>22.8%</td>
<td>32.5%</td>
<td>20.0%</td>
<td>23.4%</td>
<td>-0.8%</td>
<td>-2.9%</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of qualified personnel</td>
<td>11.5%</td>
<td>16.1%</td>
<td>9.4%</td>
<td>11.4%</td>
<td>+0.8%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Lack of information on technology</td>
<td>6.7%</td>
<td>5.4%</td>
<td>5.8%</td>
<td>7.2%</td>
<td>+1.5%</td>
<td>+1.1%</td>
</tr>
<tr>
<td>Lack of information on markets</td>
<td>5.6%</td>
<td>6.4%</td>
<td>5.4%</td>
<td>3.8%</td>
<td>-0.3%</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Difficulty in finding cooperation partners for innovation</td>
<td>7.3%</td>
<td>6.1%</td>
<td>7.9%</td>
<td>4.8%</td>
<td>-0.8%</td>
<td>-1.6%</td>
</tr>
<tr>
<td>Market</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Markets dominated by established enterprises</td>
<td>13.1%</td>
<td>13.3%</td>
<td>13.5%</td>
<td>12.2%</td>
<td>-0.1%</td>
<td>-0.8%</td>
</tr>
<tr>
<td>Uncertain demand for innovative goods or services</td>
<td>11.0%</td>
<td>11.7%</td>
<td>10.1%</td>
<td>9.4%</td>
<td>-1.1%</td>
<td>-2.2%</td>
</tr>
<tr>
<td>No need to innovate because of no demand for innovations</td>
<td>8.5%</td>
<td>7.6%</td>
<td>7.0%</td>
<td>11.0%</td>
<td>+2.4%</td>
<td>+2.8%</td>
</tr>
</tbody>
</table>

Source: CIS-4

Unfortunately, CIS-4 does not provide information concerning the factors preventing innovation distinguishing size-classes for the wholesale and retail trade sector as it does in other sectors of NACE. Obviously, the relevance of factors such as costs, access to funds or knowledge of the possibilities will differ between small and large firms and this information would be valuable in designing more accurate policies for each group.

1.3.3 The innovation process

Beyond the kind of innovative activities the firm develops as already studied in the previous section, figure 1.7 shows the R&D expenditures as well in this sector. As it can be seen, wholesale firms are the ones that dedicate a larger part of their turnover to R&D while motor/vehicles traders exhibit a figure almost half of them, with retailers close to wholesalers. Although the figure can be considered
high, it must not be forgotten that the innovation in the whole activity will be the result of combining it with the percentage of firms that do this kind of investment.

**Figure 1.7** 
Innovation intensity (only for innovative firms)

**Figure 1.8** 
R&D expenditures (% of total turnover, only for innovative firms)

Note: See codes on Table A1.

Figure 1.8 shows the R&D intensity for each 3 digit subsector with data available. Sectors 50.4 (sale, maintenance and repair of motorcycles and related parts and accessories), 52.1 (retail sale in non-specialised stores) and 52.6 (retail sale not in stores) are the ones with the highest intensities. Sectors
50.3 (Sale of motor vehicle parts and accessories) and 50.7 (Repair of personal and household goods) are at the bottom.

Innovation is no longer an activity that can be developed in isolation. On the one hand, the increasing complexity of innovation processes makes it more and more difficult (and then, costly) to develop all the stages of an innovative process by a single firm. On the other hand, certain degrees of cooperation are necessary to evaluate the result of an innovation effort (for instance technologies that process automatically shipments in reaction to inventory levels, or technical devices that must be incorporated in other goods). In some other cases, the results of an innovation process may have spillovers into other activities. In these cases, unless some kind of cooperation was implemented (whether between the possible users or with institutions that may transmit those possibilities to them), part of the gains will not be exploited and, if costs are high, the innovation process becomes unprofitable for a single agent. Thus, it is not surprising that cooperation programs for innovative activities are important parts of the innovative activities of firms. The fact that in Europe there is a wide network of universities and public research centres is a valuable basis for establishing cooperation agreements with firms where all the innovation possibilities have not yet been exploited.

Results of innovation

Many of the results of the innovation process of wholesale and retail trade activities cannot be identified in the same way as in manufacturing activities. As mentioned before, a new “product” of the retailing or wholesale activity is not the sale of a new good or service, but a new way to sell it (which can be due to the location, the assortment of items offered to the potential customer, the position of shelves, etc.) but this distinction is not easily done in surveys and there are some doubts about the information CIS-4 contains in this field.

CIS-4 provides some basic information on what the firms consider to be their results of the innovative activities they undertake. These results are considered both in terms of the output they serve to the market, on their production process, as well as in their marketing activity and internal organisation. Table 1.4 collects these results showing that as expected wholesale and retail trade innovation focuses on marketing (which is, by its nature, almost their core activity) as well as in their internal organisation. The introduction of new goods/services, as well as the improvement in their quality that a firm reports, must be considered cautiously, since changes in the good sold are not a change in the activity of a wholesaler/retailer, but a change by the manufacturer that produces such item.
Table 1.4 Innovation results (% of innovative firms that achieve each of the results)

<table>
<thead>
<tr>
<th>Innovation Area</th>
<th>Wholesale and retail trade</th>
<th>Motor</th>
<th>Wholesale</th>
<th>Retailing</th>
<th>DT- Industry gap</th>
<th>DT- Total gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased range of goods and services</td>
<td>28.1%</td>
<td>29.2%</td>
<td>32.1%</td>
<td>21.0%</td>
<td>-5.9%</td>
<td>-6.1%</td>
</tr>
<tr>
<td>Entered new markets or increased market share</td>
<td>23.2%</td>
<td>19.8%</td>
<td>27.2%</td>
<td>19.0%</td>
<td>-6.0%</td>
<td>-6.0%</td>
</tr>
<tr>
<td>Improved quality in goods or services</td>
<td>34.8%</td>
<td>42.9%</td>
<td>32.9%</td>
<td>38.0%</td>
<td>-2.8%</td>
<td>-2.5%</td>
</tr>
<tr>
<td>Improved flexibility of production or service provision</td>
<td>22.2%</td>
<td>24.2%</td>
<td>22.9%</td>
<td>21.5%</td>
<td>-2.4%</td>
<td>-2.4%</td>
</tr>
<tr>
<td>Increased capacity of production or service provision</td>
<td>23.1%</td>
<td>24.9%</td>
<td>20.8%</td>
<td>20.7%</td>
<td>-1.2%</td>
<td>-2.6%</td>
</tr>
<tr>
<td>Reduced labour costs per unit output</td>
<td>14.5%</td>
<td>15.7%</td>
<td>14.9%</td>
<td>15.8%</td>
<td>-3.1%</td>
<td>-4.9%</td>
</tr>
<tr>
<td>Reduced materials and energy per unit output</td>
<td>8.3%</td>
<td>8.0%</td>
<td>8.5%</td>
<td>8.0%</td>
<td>-1.4%</td>
<td>-2.5%</td>
</tr>
<tr>
<td>Reduced envir. impacts or improved health &amp; safety</td>
<td>13.4%</td>
<td>20.9%</td>
<td>13.5%</td>
<td>9.0%</td>
<td>-0.6%</td>
<td>-2.9%</td>
</tr>
<tr>
<td>Met regulation requirements</td>
<td>20.6%</td>
<td>29.5%</td>
<td>17.9%</td>
<td>20.6%</td>
<td>+2.4%</td>
<td>+2.2%</td>
</tr>
<tr>
<td>Introduced organisational innovation</td>
<td>60.3%</td>
<td>64.7%</td>
<td>65.2%</td>
<td>57.5%</td>
<td>+1.1%</td>
<td>+4.2%</td>
</tr>
<tr>
<td>Introduced marketing innovation</td>
<td>37.0%</td>
<td>37.3%</td>
<td>38.5%</td>
<td>34.6%</td>
<td>+3.5%</td>
<td>+5.3%</td>
</tr>
<tr>
<td>Reduced time to respond to customer or supplier needs</td>
<td>24.0%</td>
<td>29.7%</td>
<td>26.4%</td>
<td>21.0%</td>
<td>+1.0%</td>
<td>+1.8%</td>
</tr>
<tr>
<td>Improved quality of goods or services</td>
<td>26.4%</td>
<td>32.9%</td>
<td>27.3%</td>
<td>25.3%</td>
<td>+0.7%</td>
<td>+3.1%</td>
</tr>
<tr>
<td>Reduced costs per unit output</td>
<td>9.9%</td>
<td>13.4%</td>
<td>12.1%</td>
<td>8.2%</td>
<td>-2.0%</td>
<td>-2.5%</td>
</tr>
<tr>
<td>Improved employee satisfaction and/or reduced rates of employee turnover</td>
<td>12.3%</td>
<td>16.0%</td>
<td>13.2%</td>
<td>11.5%</td>
<td>+1.9%</td>
<td>+3.5%</td>
</tr>
</tbody>
</table>

Source: CIS-4 for innovative firms

Table 1.4 shows that there are no big differences in the results of innovation between wholesalers and retailers. The only difference lies in the growth-oriented results (both in products and in markets) that, not surprisingly, seem to be more important for wholesalers than for retailers. A complementary analysis on the results of innovation for Wholesale and retail trade firms can be done on the basis of the application of legal protection figures on innovation, but it must be remembered that innovation in services (Wholesale and retail trade is not an exception), is rarely subjected to patents or registration.

So even with the criticisms that the use of patent’s statistics generates as an indicator of innovation results (see Griliches, 1990), in the case of services they will be an even less adequate indicator. Firms in this sector will use, to the extent possible other alternatives for the legal protection of their results.

Table 1.5 reports the percentage of innovators applying for each of the different register options for innovations. The percentage of firms that apply for any form of intellectual protection is surprisingly high (close to 30% of wholesalers and over 20% of retailers). Among the different possibilities of intellectual protection of innovation, firms in the wholesale and retail trade sector mostly apply for trademarks. Trademarks are typically a name, word, phrase, logo, symbol, design, image or a combination of these elements identifying a unique source and to distinguish products or services from those of other entities. In terms of innovation, trademarks do not reflect an important change in the product nor in the production process of a firm, but only in (part of) the image the firm sends to the market. Beyond the question of trademarks, it is noteworthy that almost 10% of innovator wholesalers applied for patents or registration of industrial designs.
Table 1.5  Innovation results susceptible of registration (% of firms that obtain each of the results)

<table>
<thead>
<tr>
<th>Innovation result</th>
<th>Sector</th>
<th>Motor</th>
<th>Retailing</th>
<th>Wholesale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied for intellectual protection (patent, design, etc.)</td>
<td>12.8%</td>
<td>22.9%</td>
<td>29.6%</td>
<td></td>
</tr>
<tr>
<td>Applied for a patent</td>
<td>3.0%</td>
<td>3.2%</td>
<td>9.9%</td>
<td></td>
</tr>
<tr>
<td>Registered an industrial design</td>
<td>2.8%</td>
<td>8.4%</td>
<td>8.7%</td>
<td></td>
</tr>
<tr>
<td>Register a trademark</td>
<td>12.2%</td>
<td>18.1%</td>
<td>27.1%</td>
<td></td>
</tr>
<tr>
<td>Claimed copyright</td>
<td>2.2%</td>
<td>4.5%</td>
<td>4.6%</td>
<td></td>
</tr>
</tbody>
</table>

Source: CIS-4

The analysis of the intellectual property protection of innovations by 3 digit subsectors shows that 50.4 (sale, maintenance and repair of motorcycles and related parts and accessories), 52.2 (retail sale of food, beverages and tobacco in specialised stores) and 52.6 (retail sale not in stores) are, by large, the activities with the highest frequency. The reasons that explain each of the three cases are quite different, although in all of them, the percentage of firms that register trademarks is high. The subsector 50.4 has a large percentage of firms that apply for patents and register industrial designs, (probably linked to the repairing activity); 52.2 and 52.6 have a large percentage of firms that register industrial designs and the last one also of copyrights.

Figure 1.9  Innovation results and innovation effort (only for innovative firms)

Although a firm-based analysis could provide further and more robust conclusions on the results of the innovation activities in Wholesale and retail trade activities, an analysis based on subsectors will allow us to establish a relationship between the innovative intensity in these narrow-defined activities and their results. Figure 1.9 shows the innovation results (measured by the percentage of firms that in each 3 digit sub-sector apply for any form of intellectual protection and by the introduction of new products in the market) in comparison with the innovation effort (measured by R&D expenditures as % of turnover). As expected, the conclusion is that the subsectors where firms carry on a higher innovative intensity are the ones directly correlated with the obtained results.
Table 1.6  Innovation results (Percentage of innovative firms that obtain each of the results)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Motor</th>
<th>Retailing</th>
<th>Wholesale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the enterprise introduce a product new to the market</td>
<td>24.7%</td>
<td>15.0%</td>
<td>35.7%</td>
</tr>
<tr>
<td>Did the enterprise introduce a product new to the firm</td>
<td>43.6%</td>
<td>33.0%</td>
<td>46.3%</td>
</tr>
<tr>
<td>% of turnover during 2002-2004 from:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New or improved products to the market</td>
<td>5.2%</td>
<td>2.9%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Unchanged or marginally modified products new to the firm</td>
<td>14.2%</td>
<td>9.2%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Unchanged or marginally modified products</td>
<td>65.5%</td>
<td>73.2%</td>
<td>66.6%</td>
</tr>
<tr>
<td>Introduced organisational changes</td>
<td>64.2%</td>
<td>56.9%</td>
<td>59.9%</td>
</tr>
</tbody>
</table>

Source: CIS-4

A simple comparison of the percentage of firms that introduce new products in the market reported in table 1.6 and the percentage of firms that apply for a patent highlights a large difference between them. This was expected given the nature of “product innovations” in service activities and that there are economic reasons moving firms not to apply for a patents or a patentable innovation (see Hausman et al, 1984 and the subsequent literature on this topic). While more than one third of innovative wholesalers confirms to have introduced new products on the market, less than ten percent of them applied for a patent. Besides, this difference is larger in the other subsectors. The percentage of motor/vehicles firms that indicate having introduced new products in the market is eight times larger than the ones that apply for a patent and five times in the case of retailers.

The share of sales that firms attribute to innovations shows a special pattern too: while the introduction of new products in the market is expected to create a larger percentage of turnover for innovative wholesalers than for firms in other sectors, the marginal modifications of the product (new to the firm) presuppose a larger percentage of turnover in motor/vehicle sector. Probably, these different percentages translate the number of innovations of each class and not only the economic relevance of these changes.

Finally, there is information about organisational changes introduced in the firm. For service firms these changes may become more important than in manufacturing since it has a more important role in the efficiency level of the production process. As we can see in table 1.6, more than half of innovative wholesalers and retailers in Europe have introduced organisational changes. The smaller percentage that retailers show can probably be explained by the smaller percentage of firms in this sector. It is difficult to explain the economic impact of organisational changes, since many situations can fit into this category of innovation, but it is important to note that in the production processes of services, where labour has a more important role than in manufacturing (since there is not a good to transform), a more efficient organisational design may facilitate reaching higher quality standards, reducing redundant hours, saving material inputs or to accumulate knowledge that facilitates further improvements.
Consequences of innovation

In order to provide some insight on the consequences of the innovative activities in the Wholesale and Retail trade sector, we have used the data on the Structural Business Statistics (SBS henceforth) for the 3 digit subsectors in the Wholesale and Retail activities in relationship with the innovation activities that CIS-4 reports. As CIS-4 does not contain information for the whole EU-27, we computed the results only for those countries where information was reported in CIS-4 to avoid any bias in the comparison. The results are focused on different areas: firms and employment evolution, output, productivity and gross turnover and investments. As is well known, no conclusion on causality should be extracted on analysis like these ones, since any other unknown variable could interfere in the observed relationship. Figure 1.10 puts into relation the percentage of firms that introduce innovation in each of the 3-digits subsectors of Wholesale and retail trade according to CIS-4 and the growth in the number of firms and employees in each of these subsectors according to SBS. The reasons that favour a larger growth in innovative sectors are both internal and external. From an internal perspective, as innovation may lead to a more efficient production process, it allows price reductions, reaching previously inaccessible customers and increasing the business opportunities. From an external perspective, a more efficient sector may increase its business at the expense of others: Firstly, given that there is some possibility of substitution across sectors from the point of view of customers (firms classified in one of the subsectors may develop an activity that crowds out firms in other subsectors) innovation can be a source of growth for one sector, even without any organic growth. Secondly, as trade sectors become more efficient, producers of the good to be traded will find less profitable to integrate the activity, making room for a larger growth of trade in the sector.

Figure 1.10  Innovation, employment and firm creation

As shown in figure 1.10, the most innovative subsectors in the wholesale and retail trade sector are the ones that have experienced a larger increase in business population as well as in employment. Consequently, it seems that innovation is creating a positive effect for these sectors in accordance with the analysed data.

An important question is to know whether this positive relationship is generalised for firms according to their size. The available data oblige us to be very cautious on the conclusions of this analysis, since the confidentiality requirements of data publication in SBS suppose that there are no data published in
some 3-digit subsectors on the five size classes that Eurostat distinguishes. Beyond that, figure 1.10 reveals the same relationship in the five size classes and there are no important differences between the larger and smaller firms. It seems that the growth of employment in the largest (over 250 employees) and the smallest (1 employee) firms does not depend on the innovative intensity of their subsectors. On its part, the growth in the population of firms is larger in more innovative subsectors for smaller size classes, given that new entrants usually are smaller.

**Figure 1.11  Innovation, employment and firm creation according to the size of firms**

As we can see in both figures 1.12, those subsectors which can be categorised as more innovative (the ones with a larger percentage of firms that have introduced innovation onto their markets) are the ones with a larger employment growth and firm net creation.

**Figure 1.12  Innovation and productivity**

The link between productivity and innovation is well established in the literature, especially in manufacturing activities. As can be seen in figure 1.12, subsectors where more firms introduce innovations are the ones that present higher productivity levels. The link can be in two senses: more innovation pushes productivity, but higher levels of productivity allow for margins to innovate or oblige the firms to innovate if competition in the market becomes tougher. The second panel in this figure shows that there is no relationship between innovative intensity of the subsector and productivity...
growth, although we must be conscious that this link may have many other variables that interfere, such as the maturing time of innovations, the evolution of competition in each subsector, etc.

According to economic literature innovation affects the performance of firms not only in terms of productivity but also in other dimensions. Restrictions on the available information limit the possibilities of the study to some of the non-financial variables. Among the possibilities, as analysed in figure 1.13, are the growth in operating surplus (the closest proxy to the profit of a firm) and in investment (that is related both to the investment the firm may obtain as well as the future plans to develop).

**Figure 1.13 Innovation and performance**

As illustrated, the relationship between innovative activities in the sector and gross surplus evolution is insignificant (as it is with the current level of gross surplus). Notwithstanding this we find a positive relationship with the growth in investment intensity.

**Geographically based analysis of innovation on Wholesale and retail trade activities**

**Figure 1.14 Innovative behaviour of firms**

Figure 1.14 shows the differences on the innovative behaviour of firms among the geographical areas that are studied in this report. Results show how firms from Southern European countries are the ones that frequently introduce innovations, which differs from the innovative activities in other sectors.
Table 1.7 Innovations introduced by firm location

<table>
<thead>
<tr>
<th>Innovation introduced into the market:</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>A new or significantly improved good</td>
<td>East 8.2% North 10.4% South 9.2%</td>
</tr>
<tr>
<td>A new or significantly improved service</td>
<td>East 6.3% North 8.2% South 9.2%</td>
</tr>
<tr>
<td>A new or significantly improved method of production</td>
<td>East 4.7% North 10.9% South 7.7%</td>
</tr>
<tr>
<td>A new or significantly improved logistic, delivery or distr. System</td>
<td>East 6.5% North 12.0% South 10.1%</td>
</tr>
<tr>
<td>A new or significantly improved supporting activity</td>
<td>East 9.8% North 10.0% South 22.4%</td>
</tr>
<tr>
<td>Enterprise with on-going or abandoned innovation activities</td>
<td>East 5.6% North 8.5% South 6.4%</td>
</tr>
</tbody>
</table>

Source: CIS-4

Table 1.7 allows a more detailed analysis of the geographical differences of innovation. Results show that the source of the advantage is the introduction of supportive activities, since almost one fourth of Southern European firms have done it, while in the other areas the figure is limited to circa 10%. On its part, firms from Northern European lead in the introduction of new or improved good/services (small differences) and introduction of new or improved production methods.

Table 1.8 analyses the innovative activities on the basis of the location of firms. These results show important differences in the three considered areas. While acquisition of machinery is the most frequent innovative activity for firms located in Southern and Eastern Europe, for firms located in Northern Europe, training is the most common one. It must be remembered that firms located in Southern Europe reported the largest percentage of innovators and these results show that it is due, basically, to a more frequent acquisition of machinery. It should also be noticed that the percentage of Northern European firms that use training as an innovative activity is relatively larger than Southern European firms (ten percentage points) or Eastern European firms (twelve percentage points). The large percentage of northern firms that are engaged in intramural R&D and cooperation arrangements on innovation activities is remarkable. It seems that the kind of innovative activities that wholesale and retail trade companies develop differs notably across areas: while Northern European firms rely more on training, intramural R&D and cooperation agreements, Southern European firms rely notably more on acquisition of machinery and less in cooperation or R&D activities; Eastern European firms are in an intermediate position between them.

Table 1.8 Innovative activities by firm location (only for innovative firms)

<table>
<thead>
<tr>
<th>Area</th>
<th>East</th>
<th>North</th>
<th>South</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engagement in intramural R&amp;D</td>
<td>28.2%</td>
<td>46.7%</td>
<td>30.9%</td>
</tr>
<tr>
<td>Engagement in extramural R&amp;D</td>
<td>21.0%</td>
<td>19.5%</td>
<td>18.4%</td>
</tr>
<tr>
<td>Engagement in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other external knowledge</td>
<td>28.0%</td>
<td>30.2%</td>
<td>18.2%</td>
</tr>
<tr>
<td>Training</td>
<td>47.7%</td>
<td>59.6%</td>
<td>49.8%</td>
</tr>
<tr>
<td>Market introduction of innovation</td>
<td>43.8%</td>
<td>34.9%</td>
<td>30.6%</td>
</tr>
<tr>
<td>Acquisition of machinery</td>
<td>67.4%</td>
<td>56.6%</td>
<td>82.3%</td>
</tr>
<tr>
<td>Cooperation arrangements on innovation activities</td>
<td>31.7%</td>
<td>35.9%</td>
<td>14.2%</td>
</tr>
</tbody>
</table>

Source: CIS-4
The analysis of the differences across geographical areas in figure 1.15 illustrates that, although firms from the southern area were the most innovative ones and the Eastern European ones the least, the amount they dedicate to R&D expenditures shows the opposite results: firms from Eastern European countries invest a larger percentage of their turnover in R&D than northern or southern firms. That is, although in Eastern Europe the percentage in innovative firms in Wholesale and retail trade is smaller, the ones that innovate dedicate a larger percentage of their sales to innovative investments. In any case, it must be remembered that the comparison is on R&D expenditures in % of turnover, which means that if turnover is smaller, a larger effort is needed to develop innovations in some areas that do not depend on the figure of sales (such as software to categorise customers or to handle inventories).

Table 1.9 Innovation results susceptible of registration by location (% of firms that obtain each of the results)

<table>
<thead>
<tr>
<th></th>
<th>East</th>
<th>North</th>
<th>South</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied for intellectual protection (patent, design, etc.)</td>
<td>23.4%</td>
<td>34.1%</td>
<td>21.6%</td>
</tr>
<tr>
<td>Applied for a patent</td>
<td>5.9%</td>
<td>11.9%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Registered an industrial design</td>
<td>4.6%</td>
<td>16.8%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Registered a trademark</td>
<td>18.0%</td>
<td>30.8%</td>
<td>19.8%</td>
</tr>
<tr>
<td>Claimed copyright</td>
<td>4.9%</td>
<td>7.0%</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

Source: CIS-4

Table 1.9 shows that firms from Northern European countries exhibit quite larger percentages in all the indicators that firms from the southern area, both in trademarks and in all other indicators. Innovators from Eastern European countries are slightly below their southern equivalents with the exception of copyrights. Beyond the analysis of innovation results, based on their intellectual protection, the information of CIS-4 allows to carry out an economic analysis of these results that could be more adequate in services activities where many of the innovations do not fit onto categories for being registered.
Table 1.10 Innovation results by location (% of innovative firms that obtain each of the results)

<table>
<thead>
<tr>
<th></th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>East</td>
</tr>
<tr>
<td>Did the enterprise introduce a product new to the market</td>
<td>59.9%</td>
</tr>
<tr>
<td>Did the enterprise introduce a product new to the firm</td>
<td>72.7%</td>
</tr>
<tr>
<td>% of turnover during 2002-2004 from:</td>
<td></td>
</tr>
<tr>
<td>New or improved products to the market</td>
<td>10.7%</td>
</tr>
<tr>
<td>Unchanged or marginally modified products new to the firm</td>
<td>10.3%</td>
</tr>
<tr>
<td>Unchanged or marginally modified products</td>
<td>53.8%</td>
</tr>
<tr>
<td>Introduced organisational changes</td>
<td>58.7%</td>
</tr>
</tbody>
</table>

Source: CIS-4

Table 1.10 summarises this information, showing the percentage of firms that confirm to introduce product innovations (whether for the firm or the market), organisational changes and an evaluation of the impact on sales of the innovations the firm has introduced. The most interesting result observed is that firms in the east introduce more innovations in the market (and for the firm) and that they obtain a larger percentage of their turnover from these kinds of innovation. This result can probably be explained by the fact that the markets of these countries are lagging behind other European countries and that their markets depart from a less developed situation. Thus, there is room for innovations that step by step are being introduced as these data show.

Some results on public funds supporting innovative activities

The fact that innovation has, besides private, social benefits is one of the reasons to justify the use of funds of the taxpayers to subsidise innovative activities in firms. The other main justification lies in the imperfection of capital markets that do not provide the socially efficient amount of funds, due to the existence of imperfect asymmetry, moral hazards, etc. For these reasons, public administrations in Europe dedicate large amounts of public funds to subsidise innovative activities by firms through different government levels and programmes. However, the consequences of subsidies to entrepreneurial innovation is open to discussion, since it cannot be established, on a general basis, if these subsidies fuel further innovation efforts or if they substitute the funds that, in any case, firms would dedicate to these activities. Besides, these subsidies can affect market competition as the firms that receive them get funds not generated internally. When analysing the public funding that wholesale and retail trade firms receive (table 1.11), important differences are not observed between wholesalers and retailers. Nevertheless, wholesalers receive more frequently funds of national or European origin, while retailers get them principally from local/regional authorities. Besides the problems of the data reliability, the result would suggest that as wholesalers are larger, and in many cases, with different establishments across countries, their efforts are better focused.
Table 1.11  % of innovative firms that receive public funding of their innovation activities

<table>
<thead>
<tr>
<th>Sector</th>
<th>Motor</th>
<th>Retailing</th>
<th>Wholesale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public funding from:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any authority</td>
<td>9.6%</td>
<td>14.2%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Local or regional authorities</td>
<td>6.2%</td>
<td>11.4%</td>
<td>7.7%</td>
</tr>
<tr>
<td>Central government</td>
<td>3.8%</td>
<td>4.1%</td>
<td>7.9%</td>
</tr>
<tr>
<td>EU</td>
<td>0.1%</td>
<td>0.5%</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

Source: CIS-4

As seen in this table, almost 15% of innovative wholesalers and retailers have received public funding, reducing this percentage to almost 10% in the case of motor/vehicles. As mentioned above, retailers usually receive funding more frequently from closer levels of government (local/regional authorities and central government), while for wholesalers this pattern is not so clear. Then, we may conclude that support to innovative activities of retailers is provided mainly by local/regional governments and that few of them gain access to European supportive actions that are concentrated on wholesalers.

The analysis is taking into consideration the area of the innovator highlights, namely that the percentage of firms located in the southern area that receive public funds is quite high (nearly one fifth), while it is only 6% in the northern area. Firms from the eastern area are in an intermediate position. The differences between the sources of the funding are not important given that the distinction between local/regional and central governments is very influenced by the political structure of the countries in each area. Beyond that, the relative importance of funding from the EU is quite similar (one fifth of innovators that receive public funds, receive them from the EU).

Table 1.12  Percentage of innovative firms that receive public funding of their innovation activities by location

<table>
<thead>
<tr>
<th>Area</th>
<th>East</th>
<th>North</th>
<th>South</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public funding from:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any authority</td>
<td>9.2%</td>
<td>6.0%</td>
<td>19.3%</td>
</tr>
<tr>
<td>Local or regional authorities</td>
<td>1.0%</td>
<td>3.0%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Central government</td>
<td>7.6%</td>
<td>4.8%</td>
<td>7.1%</td>
</tr>
<tr>
<td>EU</td>
<td>2.0%</td>
<td>1.3%</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

Source: CIS-4

The data on the percentage of firms that receive public funding in each 3-digit subsector shows that over 80% of firms in 52.7 (Repair of personal and household goods) receive funding, which in almost in all cases coming from local/regional authorities.
2 Carriers of innovation

2.1 People

There is a lack of information and data concerning people and workforce issues in innovation with respect to the retail and wholesale sector. Most information available is related to ICT and addresses the role of ICT adoption and e-business use in the retail sector. The eBusiness Watch Report (2008) presents some findings regarding the role of ICT skills in retail innovation:

- 11% of retail companies employ ICT specialists, but numbers differ significantly across firm size. A critical divide between SMEs and large retail firms exists. Direct investments into ICT skills remain low with a small number of micro- and small firms (10% and 15% respectively) employing ICT practitioners;
- Impact of ICT is mostly on process innovation, but also plays a role in product and service innovation. Employing people with university degrees as well as employing ICT practitioners significantly increases the propensity of retail firms to use ICT in the development of new products and services.

A UK study addressing retail sector innovation (Hristov and Reynolds, 2007) explored the issue of skills and organizational innovation. They address four areas: (1) specialist of technical skills, (2) skills to foster a culture of innovation, (3) skills related to management of innovation, and (4) innovation skills of the SME sector. In the UK, several government programmes related to innovation skills have been introduced. As a conclusion, there is a clear need to identify and support the complex sets of skills for retail innovation in a more integrated way, in order to stimulate, manage and sustain innovation within both large and small firms. Van der Giessen et al., 2009 studied the issue of jobs and skills for the wholesale and retail trade sector from a future perspective. Skills gaps, knowledge needs and how to cope with them are being identified in some detail, based on future scenarios. However, the study does not provide information about the role of work organisation and people skills in the actual innovation process. For education and training the following major challenges are identified:

- On-going technological change. This will lead to profound changes in business strategies and occupational functions in quality and quantity which are not stabilized yet;
- Low profit margins and little resources for training. This will strongly affect SMEs in the retail sector;
- On-going globalisation. This will lead to worldwide sourcing of products and business models, that will have an impact on higher skilled experts at the larger international operating companies as well as on the need for a mutual recognition of qualifications;
- Changes in consumer behaviour and mass customisation. This will lead to new niches in the sector, the emergence for new business models and, hence, stronger specialisation and differentiation of skills;
- Workforce change. A stronger gender segmented workforce will appear, with a predominantly young and female workforce (particularly in part-time service occupation) earning substantially less than the predominantly medium aged male dominated workforce in technical occupations;
- **Role of SMEs.** A domination of SMEs in the sector, will have limited possibilities to address the emerging skills need on their own, which will also affect vocational training.

The Sectoral e-Business Watch for the retail industry (European Commission, 2008) investigated the role of e-Business innovation in the sector. One of the issues studied was the links between skills, e-collaboration and ICT-enabled innovation. It was found that skills matter: changes in share of employees with a higher university degree positively affect the likelihood of conducting ICT-enabled innovations. Similarly, employing IT practitioners significantly increases the propensity of firms to use ICT to develop new products and services. This finding provides further evidence that the success of the ICT-driven innovative process depends on the availability and quality of complementary assets.

For a number of “people” topics which should be considered as important for retail and wholesale innovation, information is lacking. Among the gaps are innovation processes on the work floor; interactions among actors in research, professional education and industry, and knowledge transfer.

### 2.2 Organisations

As elaborated in chapter 5, organisational collaboration in innovation is an important topic for the wholesale and retail sector. In chapter 1, information was presented concerning the innovation process including the types of innovative activities. It appears that workforce skills development and training is an important organisational condition for innovation. Organisational factors hindering innovation include the lack of qualified personnel and difficulty to find cooperating partners, however these factors seem not to be dominant as barriers (see also chapter 4).

There is a lack of systematic studies of the role and importance of organisational collaboration in retail and wholesale innovation. This is a serious gap in our knowledge on innovation in services, since the main innovation parameter in services is organisational and not technological. A real breakthrough in determining how to improve the competitiveness of services necessitates a study exclusively dedicated to this subject and not just limited to wholesale and retail trade. This would also need to include the customer interaction in innovation processes.

### 2.3 Clusters and networks

This section analyses the types of cooperation agreements of firms in the wholesale and retail trade sector. As was shown in chapter 1, table 1.2, around 20% of innovators in the wholesale and retail trade sector have arrangements of this kind, more common in the wholesale subsector and less frequent among countries in the southern area or Europe. CIS-4 collects information about a large variety of potential partners for cooperation agreements in innovation. From this set, we have grouped seven classes: The first two classes do not distinguish between the nature of the partner, but only whether they are from the same country or not; the next two classes refer to university and research non-commercial centres; the fifth class considers the agents in the market of the firm (suppliers, customers or competitors) from the firm’s country; the last two classes refer to customers of the firm, distinguished on the basis of their nationality.
Figure 2.1 summarises the percentage of firms that have cooperation agreements with each of the seven classes of partners under consideration. The first interesting result is the fact that firms in whatever subsector mostly cooperate with domestic partners, and especially with agents of their markets. Cooperation with foreign partners (whether they are agents of the market, universities or research centres) is relatively low, with wholesalers exhibiting the highest level. As it was expected, a high percentage of firms in the motor/vehicle trading subsector cooperate with other partners, who are agents of their markets, but not customers, that is, suppliers of the sales sector (carmakers).

Figure 2.1 Cooperation in innovative activities (only for firms that cooperate)

The low percentage of firms that cooperate with universities and public research centres suggest that the kind of research that is developed in these places is seen as not so valuable for traders. Adams and Clemmont, 2008 concluded that in the US universities develop the scientific base that has the largest capacity of generating spillovers. Since wholesale and retail trade activities are not an important research field for academics, the low levels of cooperation between these two areas is not surprising. This result is better understood when taking into consideration the result of table 1.1 that showed that the most common types of innovation that wholesale and retail trade firms introduce are the ones linked to supportive activities, which is not typical for the kind of research of universities and similar organisations.

The selection of partners to cooperate with in an innovation project is a complex question that depends both on the characteristics of the firm (such as the kind of innovation to develop, the resources to invest, the knowledge of the potential partners and its ability to integrate their culture into the overall firm structure) as well as the partners specificities. For instance, universities research used to be more focused on some very specific areas and the possibility of monitoring agreements may condition any cooperation with other agents of the same market. This is why the selection of partners, the adequacy of each of them given their nature, the importance of the nationality, etc. are topics for specific economic research. Figure 2.2 analyses two of these topics (whether the R&D intensity is associated to cooperation with the core-science research centres and whether there is any degree of substitution between domestic and foreign partners) on the basis of the observed frequencies on each of the sub-sectors of the wholesale and retail trade activity.
The study of Lauren and Salter, 2004 on cooperation between manufacturers and universities concludes that those firms with a high intensity on R&D, larger size and managerial choices for an open source of R&D, are the ones more likely to source their innovative strategies on universities. Although the results of figure 2.2 do not demonstrate econometrically that their result can be extended to wholesale and retail trade activities, they are consistent with the fact that, in Europe, wholesale and retail trade sub-sectors with higher levels of R&D expenditure are more used to cooperate with universities. The relationship on the nationality of the partners that the second panel of figure 2.2 shows, indicate that there is a negative relationship between those two percentages (correlation coefficient -0.42). It means that, across subsectors, the collaboration with domestic / foreign partners is seen as substitutes, that is, firms find the collaborative partner at home or abroad and once they have found one they do not establish cooperation partners in other zones.

Figure 2.3 collects the information about cooperation partners attending at the location of the innovative firm. As it can be seen, there are no important differences, with the main exception, that firms in the eastern area exhibit a larger frequency of cooperation with foreign clients (and foreign partners, then) as well as with domestic clients.
Some specific information regarding the role of ICT is available. The Sectoral e-Business Watch study for the retail industry (European Commission, 2008) investigated the role of intra- and inter-firm collaboration as regards ICT in the retail sector. It appears that retail firms that are using ICT applications to exchange information or collaborate with business partners are more likely to introduce ICT-enabled innovations compared to their peer groups in the same sector.

Collaboration across companies can be stimulated by government sponsored innovation programmes. In a few countries, programmes exist already for enhancing digital collaboration in value chains. The Dutch ‘Digital in Connection” programme focuses on innovative ICT-based solutions, including supply chain management and organisational change in sectors such as cut flowers, building and construction materials and fashion. Such programmes demonstrate the importance of collaborative innovation projects.
3 Sectoral innovation futures

3.1 Emerging and future drivers of innovation

Driven by internationalisation, globalisation, consolidation and intense price competition of the one hand and increasingly important consumer and product trends on the other hand, the landscape of wholesale and retailing is in a great flux. Boundaries between wholesale and retail are blurring. Differences between countries and between regions, together with the huge range of different products and retail formats, lead to a high complexity in regard to drivers of innovation. The major retail companies have become more influential and have expanded into new business areas such as insurance, telecommunications and even healthcare. These are mainly distribution activities, but some have even started their own production facilities. Certain businesses managed to become major world players like the biggest company in the world: Wal-Mart. For these companies this means a large number of new opportunities in terms of product diversification, efficiency benefits and integrating retail with wholesale and sometimes even product design and development. The same applies to major wholesale and production companies, which have started retailing by themselves. On the other hand, there are the many smaller players. These have many more difficulties in competing, because they cannot offer as many products at as low a price as the bigger players. In practice, the consequences can be rather drastic especially in smaller towns. Shops have disappeared from the street picture as people prefer the bigger, cheaper ‘hypermarkets’ outside of town or in larger cities. However, not all is negative, as the mass of the big players often cannot compete in specialization of services and distinctive products.

These developments first of all result in decreasing levels of diversification. Many comparable companies can be found, companies which have a lot of knowledge on how to compete and get in a strong position. Secondly, smaller – often self-owned – businesses specialise on one or more levels:

- Green retailing;
- Distinctive service (quality advise, knowing your customer);
- Focusing on distinctive customers (e.g. ageing, sports);
- Bundling power: chains;
- E-business.

These developments are copied rapidly by other (and larger) companies. It is continuously difficult for the specialized retailers to compete with discounters. Discounters cover many different products such as clothes, food, shoes, household articles and consumer electronics and are characterised by their ability their supply at short notice. Examples are gas stations selling bread, supermarkets selling DVDs and books etc.

In the retail sector there are a few, but dominant drivers from the past that still affect the present and will affect the future even though with lesser impact. First of all, there is the liberalisation of the European market and secondly globalization, accelerated by ICT. The effects of globalisation on retail are, for instance, concentration and consolidation, differentiation of goods and services and
acceleration (Pietersen, 2004). These effects also constitute the major themes of innovation, covered later in this report.

Some form of stagnation was visible already long before the financial crisis of 2008-2009 and the retail business responded with new strategies. Therefore, stagnation might not be classified as a “driver”, but definitely as a crucial variable. Stagnation affects first of all luxury goods in non-food sales (clothes, jewellery and watches, furniture, cars, consumer electronics). Globalisation took place mostly on the purchase side. On the sales side, business is still very regionally structured, despite hypermarkets, an increase in internet sales (B2B) and mail order selling (Lademann, 2004: 77). Exceptions are books, software and sound carriers. Especially in rural areas, consumers make more use of those two features (in German rural areas account for 15% as compared to 2-3% in urban areas). A special innovation driver, important in the retail sector, is the close relation to the customer. Especially since retailers have started to collect and analyse customer data systematically, they have been in a good strategic position to develop and place their products and services in order to match customer demand. A framework of internal and external drivers of innovation has been developed by Hristov and Reynolds, 2007 (table 3.1).

Table 3.1 Drivers of innovation

<table>
<thead>
<tr>
<th>External drivers</th>
<th>Internal drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Customer trends</td>
<td>• Strategy and business planning</td>
</tr>
<tr>
<td>• Competitive environments</td>
<td>• Top management vision and leadership</td>
</tr>
<tr>
<td>• Industry cycles and organisational growth</td>
<td>• Operational efficiency</td>
</tr>
<tr>
<td>• Regulatory environment</td>
<td>• Organisational culture and structure</td>
</tr>
<tr>
<td>• Technology</td>
<td>• Innovation reward mechanisms</td>
</tr>
<tr>
<td>• Retailer-supplier relations</td>
<td>• Availability of resources</td>
</tr>
</tbody>
</table>

Finne and Sivonen, 2009 identified key change drivers for the retail value chain, under which a large part of the wholesale sector can be placed as well (figure 3.1). The increasingly important impacts of ICT enabled trends in relation to customer empowerment is visualised in figure 3.2.
Figure 3.1 Key change innovation drivers in the retail value chain

Consolidation
- Retail consolidation

New competition
- Growth of value and premium retailing

Convergence
- Convergence with other industries

Sustainability
- Corporate responsibility
- Environmental trends

Product trends
- Rise of own labels
- Product safety
- Development of

Internationalization
- Growth of large emerging markets
- Saturation in home markets

IT enabled trends
- Loyalty programmes and event based personalized dialogue
- Store operations automation and retail task management

Regulation and de-regulation
- Store hours
- Sales of alcoholic beverages
- Over-the-counter medicines

Consumer trends
- Time-rushed consumers
- Easiness and quickness
- Experience economy

Source: Finne, Sivonen (2009)

Figure 3.2 ICT and the wholesale and retail trade value chain

Figure 3.3 (adapted from Finne and Sivonen, 2009) visualises drivers and innovation themes mostly applicable to the retail sector. Customer empowerment represents one important class of drivers; the other important class represents the importance of technological innovation.
(1) Blurring of boundaries between wholesale and retail functions

Drivers of innovation and change in the wholesale and retail sector are both intra-sectoral but there are also drivers outside the sector with high impact. There is the trend towards the vertical integration of retail and wholesale, where a high amount of retail outlets belong to groups which also carry out wholesale trading (for the German case, see: Wortmann 2004). Retailers are expanding to new service areas such as insurance, banking, foodservice and even health services and new players are also entering the retail sector. The traditional distinction between wholesale and retail distribution is becoming increasingly difficult to make, as the main actors are becoming steadily more integrated. Retailers become wholesalers and wholesalers want to become retailers. With the adoption of just-in-time methods in distribution the relationships between manufacturers, wholesalers and retailers has been transformed. Concerning wholesale, the competitive environment is increasingly becoming complex and internationalised. Producers are opening their own stores and selling through the Internet and retailers are doing business directly with the producers and entering the market for professional users (van der Giessen et al. 2009). This has implications for the sectoral innovation system as innovation strategies are addressing organizational matters at first. Technological innovation or other innovation strategies, e.g. social innovation are usually subsumed under this priority or affecting new forms of organization at arm’s length.

(2) Internationalisation and liberalisation

Liberalisation of the European market and internationalisation, accelerated by ICT, are two important drivers in the sector. The effects of globalization on retail are, for example, concentration/consolidation, differentiation of goods and services, acceleration (Pietersen 2004).
The retail industry is considered as one of the least internationalised of leading economic sectors and internationalisation carries risks for retailers (for example the failure of Wal-Mart). Retailers have two different strategic choices in internationalisation. They can create a proprietary network of foreign subsidiaries, i.e. through foreign direct investment. Within this strategy they can either choose greenfield development strategies (the retailer sets up its operations from scratch), or can chose the acquisitions of existing local players or a combination of both. Instead, retailers can limit their capital and physical exposure within the internationalization strategy by building networks with local and regional partners (for example key suppliers, key retail partners, key competitors and non-business infrastructure organisations) that can achieve different value added activities in partnership with the retailer (Girod and Rugman 2005).

Most developed countries share the same basic retail formats, although their importance and dissemination vary substantially across different countries. This offers retailers in other countries the opportunity to identify gaps in their own national retail landscape and to develop strategies for certain retail formats (Ahlert, Blut et al. 2010).

(3) Demand side drivers and emerging markets

As every customer is different, the retail sector can be and actually is extremely dynamic. Another important reason for this dynamic character is that it is fairly simple to try out new ideas. Relatively simple and at a low cost, a new name, product or service can be presented. However, the next steps of rolling out a proven concept are more complex and demanding. The tendency in retail to place the customer in the centre can be illustrated by three dimensions of customer emphasis:

- cost (to be found in discount or bargain prices, acceptable prize/quality-ratio, willingness to pay for uniqueness);
- choice (ethics, lifestyle, range, etc.);
- convenience (local, online, speed).

The retail and wholesale value chains have changed considerably over the past 20 years. And so has the customer. The wholesale and retail trade sector has been transformed into a buyer-driven sector. Mass consumption is substituted by mass customisation, tailor-made sales and services. Consumers have individual wishes and needs. The further segmentation of the markets also addresses the specific needs of the ageing population. Supported by the application of ICT tools, retailers will know more about their customers and may build up close relations with them. Based on this information and the close relations, retailers are able to make offerings tailored to the individual needs of the customer (van der Giessen et al. 2009).
Changes in the income per capita and household are an important driver on the demand side. The more people earn, the more they can spend on consumer goods. It will also work the other way around which we can already see as a result of the financial crisis – especially in the Eastern EU member states. Lifestyle differentiation, desires for personal self-fulfilment and acknowledgment are important determinants for the retail sector as well. Desires for prosperity and consumption go hand in hand with an increased focus on quality of life and well-being. Customers will look more and more for experiences, but this attention for quality of life could also lead to more demand for sustainable and environmentally friendly products.

Consumer wages in the different EU countries varied considerably, as figures from 2005 show. Whereas the Bulgarian average was below 200 US$ per capita compared to 800 US$ in the Czech Republic and Hungary and 1,000 US$ in Slovenia (KPMG 2006: 9). While income slightly increased together with easier access to credit, consumers turned more towards durable goods purchase, including cars and homes. With the credit crunch, however, consumption might experience a radical turnaround and it is hard to predict what this will mean for retail in the long run.

Convenience. From the perspective of the supply side in retail there has been considerable structural change that is still going on influenced by some technological but mainly organisational innovation. Case in point is the area of traditional specialty stores (for example brick and mortar music specialty retailers) which increasingly are on the down side. One countetrend is the retail format of retail stores at gas stations. Another predominant trend is the up scaling of size: stores move out of town to cheap industrial or outskirt areas where rent is low and parking space abundant and open larger shops with more stock and greater variety. Preferable locations are those where clients pass by on their way from home to work or where it is “fun” to shop on the weekend. This retail type responds to the consumer demand for a greater variety of goods.

The rise of large retail groups. Discount retailing (especially in regard to food) has experienced considerable expansion over decades and currently occupies an important position in the European retail industry (Colla 2003). Discount retailers expand their position in downtown areas and residential neighbourhoods. A lot of retail business that used to be specialized is being displaced by discount chains that often start locally by an entrepreneur, expand nationwide and then expand into some other European countries. Discount stores for pet food (Fressnapf), clothes (Kik), shoes (Deichmann), consumer electronics (Mediamarkt, Saturn), books (Donauland), and food (Lidl, Aldi) are on the rise. Discounters give themselves a predominantly family friendly image as their goods are low price and can be afforded by young families. The limited variety of goods makes a quick overview and fast decision making possible. The scarce display features support the impression that the prices are fair and nothing is invested in fancy set-ups that in the end will be paid by the consumer. Besides, specialty goods that are offered only for a limited period of time and at low price serve as teasers to attract the customer regularly and put him/her under pressure to buy or miss a great opportunity for consumption and to return to the store regularly.

Lifestyle of sustainable consumption: green retailing. Sustainable consumption has emerged over the past decade as a concept covering various approaches to promote consumer practices buy and
use environmentally-friendly and fair-trade products. On the one hand retailing promotes consumption, but on the other hand rates of consumption need to slow down. This confronts retailers with a paradox – and with the search for retail-friendly solutions to reducing consumption (Knight 2004). Sustainable consumption is today driven by retailers and consumers. From the consumers side a certain group of shoppers has decided that they can no longer control the big issues, they are focusing on the little things, including watching what they spend (WSL’s most recent How America Shops Survey). New values have emerged, reflected in such trends as eating healthier, charitable disposal of old clothes and furniture through donations, recycling or resale, and using eco-friendly products. New values are coming to the fore and consumers are no longer defining themselves by the brands they buy and wear. The designer craze, according to WSL, is largely over. “It’s not just about having the right car or the right clothes anymore,” finds the WSL Survey. “It’s about good citizenship, products that are healthier and good for the environment, and shopping stores that support their causes.” Companies realizing this trend are responding to the consumer demand by the so called LOHAS: lifestyle of health and sustainability (alternatively called LOVOS: Lifestyle of voluntary simplicity). It describes a well-educated middle-class elite trying to apply consumer responsibility and their post-modern values for environmentally friendly and politically correct values to the retail market. They have realized that as consumer they do have some power to face producers. Sociologist and some organized LOHAS groups already speak of the “LOHAS movement”. Some marketing companies suggest that this movement will also spill over to less wealthy and lower class consumer groups but facing the financial crisis this seems unlikely. LOHAS probably do not belong to the group of people getting laid off in the course of the crisis nor does the stock market shake out limit their daily spending (LOHAS are more likely to invest in eco stocks that have not faltered as much as “traditional” stocks or hedge funds). Even though this consumer group or movement is small, this elite has an enormous purchasing power. The values transported here are not new. In fact, in the US they can be traced back to the counter culture movement of the 1960’s. This movement has an increasing influence on everything: day-to-day living, social issues, and economics. In contrast to most other consumer groups, LOHAS have created their “scene”, a lifestyle identity. And it’s already having a direct impact on specialty retail, for example food, clothes, furniture, health & beauty products, even cars.

The marketplace includes goods and services such as: organic and locally grown food, organic and natural personal care products, hybrid and electric cars, green and sustainable building, energy efficient electronics/appliances, socially responsible investing, natural household products (paper goods and cleaning products), complementary, alternative and preventive medicine (Naturopathic, Chinese medicine, etc.), fair trade products, and products from companies that show some Corporate Social Responsibility (CSR).

**Corporate social responsibility.** Activities of many globally acting companies under the label of Corporate Responsibility are a reaction to the objectives of the Kyoto climate conference. Building corporate social responsibility and greening initiatives are a seen by retail actors as a way to connect with environmentally sensitive shopper. Corporate responsibility in retail involves “triple-bottom-line

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2 They cut across age groups, income and education levels, religion, geography and gender. In the US where this phenomenon is most researched and studied by marketing firms, women make up 60 percent of the group, but men spend as much, if not more—they just shop less frequently. Some are married, some have children. Whether they live in the city, the suburbs or the country, “home” is high on their list of what’s important. So are the arts and the news. They’re information junkies: they read, research and question everything they see in print, online and on the air.
thinking” including economic, environmental and social responsibility (Finne and Sivonen 2009, S. 37 ff). Companies generally object to the idea of legally binding regulations concerning CSR and this was part of the motivation to start voluntary efforts. These have resulted in national and even international organization, defining CSR and promoting CSR activities. The institutions promoting CSR are quite dispersed, though. While some consist of companies only, there is quite a number of organizations and networks from civil society. The latter ones try to promote CSR in company headquarters and in governments. Most of them share more or less the same goal, their strategies to get there differ, though. While some organizations and also some smaller companies engaged in CSR are in favour of laws that require CSR criteria to be fulfilled by all companies and evaluated by independent experts, others would not go quite as far. Alternative options are, for example, that companies meeting certain CSR criteria are getting a tax relief or are preferred for public procurement.3

These options, however, are still being discussed. To our knowledge there is no European government that has undertaken any steps toward material or legal incentives to promote CSR. There are, however, countries that are more advanced than others. In the UK, Austria and some Scandinavian countries, for example, the degree of organization is quite high and there is a dialogue between corporations and civil society organizations on the objectives of CSR and how to improve sustainability, social soundness, etc. All agreements are on a voluntary basis. Other topics discussed as CSR relevant are safety and security at the work place, education for employees, reduction of emissions, saving of energy and resources, equality and diversity, recycling, social benefits, preference of certain suppliers, sponsoring, eco-procurement, employee participation. The Austrian Network of Social Responsibility and other grass root organizations are working on more precise definition of CSR content and on detailed criteria of how to evaluate such activities (for more information contact www.sozialeverantwortung.at).

A study conducted in 2009 among Austrian corporations and their CSR practice revealed that there are basically two categories of companies (Raith, D., Bernhard Ungericht and Thomas Korenjak (2009): Corporate Social responsibility in Österreich. Netzwerk Soziale Verantwortung. Graz). The first one sees CSR as a strategy to attract consumers and present a positive picture in public for supporting societal and moral values. The second category is more committed to the normative aspects of CSR and is much in favour of anchoring such criteria legally. Proponents of the normative approach don’t want to experience disadvantages due to the fact of taking more global responsibility than their competitors. Political administrators, for example in ministries, are regarded as intermediaries to promote CSR criteria in companies and public procurement procedures on the one hand, and to engage for binding regulations both at national and European levels. This would also imply objective evaluation criteria (see www.corporatejustice.org).

From a critical social science perspective it can be observed that retailers overtake the sustainability discourse as presented by civil society organisations and reshape it to fit their interests. Retailers use

3 www.ethicaltrade.org/ The Ethical Trading Initiative (ETI) is an alliance of mainly retail or consumer goods’ companies, NGOs and trade unions operating in the UK, whose aim is to improve labour conditions in the global supply chains which produce goods for the UK market.

www.brc.org.uk/ - The British Retail Consortium is the lead trade association representing the whole range of retailers, from the large multiples and department stores through to independents, selling a wide selection of products through centre of town, out of town, rural and virtual stores.
their corporate reports to define their relationship with other stakeholders (including governments, consumers, and civil society organisations), to characterize the responsibilities of other actors, especially governments, and to attempt to influence political norms by associating them with consumption opportunities. In the context of global food governance, retailers’ discursive power can change the substance of the meaning of sustainability and their discursive power creates legitimacy for their presence as political actors in global food governance (Fuchs and Kalfagianni 2009).

**Aging society & single shoppers.** Next to the other factors mentioned above, consumer demand will be more and more influenced by aging society. Some retailers have noticed that demographic change in many parts of Europe will increase the demand for services, although consumers in general are very likely to spend less of their income in retailing compared to travel or entertainment. At the same time we are witnessing the rise of the “smart shopper” as many consumers will be more educated and possibly more critical and conscious of what they buy. Instead of price-consciousness a stronger orientation toward lifestyles will dominate consumer behaviour – constantly challenging retailers to monitor consumer needs and analyse customer behaviour (Körber 2004). The future will also be more dominated by more single shoppers; they are overburdened with the big family package sizes at Walmart and other hypermarkets.

**Market structure and consumer behaviour.** Though assortment, location, shopping hours and a lot of other important features of the retail sectors have changed over the last 30 years and a lot of these changes seem to respond to customer’s needs, we are still far away from realizing the power of the consumer. In fact, the more the internationalization of big retailers progresses, the more top-down structural power is exerted by a few companies, to a far degree determining the up-stream and down-stream conditions of the sector (see also Felber 2008).

The European Market is characterized by an increase in market concentration and a decrease in the number of small and micro firms (Dawson 2010, S. 70). The European retail market, especially the supermarket sector, is not (yet) coherently structured. Oligopolies in countries like France, Italy and the UK are much more powerful than for example in Germany. This is why in those three countries, the price level is considerably higher. For German discounters Lidl, Aldi, Rewe etc. those foreign markets are very attractive especially for this reason. In Germany, we still see a lot of price competition and a struggle for more market shares. Experts predict that this struggle will continue until the biggest three discounters will make up for three quarters of the market.

Accordingly, single consumers have little opportunity to influence this market in line with their needs. Any consumer demand that is off mainstream will take more effort than usual to be satisfied. E.g. local products, low energy consumption in the production process, fair production conditions, etc. offered in the neighbourhood of the consumer are rare. For a lot of products that for example should fulfil ethical requirements, the consumer needs to undertake quite a bit of research, travelling and s/he often has to spend more money than for competing mainstream products. Thus, the retail market is anything but a free market. In general, we can make decisions only between a few alternatives offered by a few competitors on a market that even at international level is becoming an oligopoly. A critical consumer applying ethical values to her/his purchases will not be able to challenge the system logic of this
capitalist mode. Even though there are retailers and alternative forms of production and consumption such as local exchange trading schemes (LETS), they will not have more than niche functions.

However, there are more and more consumers today who at least in part begin to realize that they carry some global responsibility with their consumption pattern. If EC emission goals and the European Union Strategy for Sustainable Development\(^4\) are to be met, a restructuring of major parts of our society have to be started, and consumption is a key to this approach. Every single citizen is a consumer and can participate in this transformation process. The system logic of capitalist growth as it is taken up in the Lisbon strategy is a barrier to this transformation efforts. We are encountering these barriers to change every day in our daily consumption pattern, for example when we buy food, clothes or furniture. There are of course a lot of good reasons to think about a change of consumption pattern. Some are already taken up in the section of ‘green retailing’.

As already indicated, three factors are crucial for the change of individual consumer behaviour:

- access to knowledge about the implications of the production chain and of the consumption pattern,
- access to purchase alternative goods by a broad choice of retailers
- the willingness and ability to spend more on everyday purchases than usual.

Limited knowledge on the production and consumption pattern is mainly due to the repetitive commercials and advertisements we encounter every day, promising to make our life more glorious, prestigious and happier. Ads are hardly ever used to inform the consumer about hard facts. It implies quite an effort to get background information on consumer goods – other than quality – and this information is usually retrieved by consumers with a lot of interest in the production life cycle and with the knowledge on how to retrieve such information. These are mostly highly educated and quite critical consumers. And those are also the ones who are more willing or able to overcome longer distances to purchase alternative goods.

In line with this trend, the willingness and ability to spend more money on everyday purchases is more appealing to the well-to-does of our society and to the more educated ones, though in the long run it might be more economical to invest more money for a long-lasting and sustainable product (furniture, clothes) than into cheap ones that break easily or are worn out. It is also a matter of personal priority of course.

To make better informed choices, consumers need to have access to transparent and comparable information on products and services offered by different retail services throughout the EU. On the other hand, all retail service providers (from huge retail chains to local shops) need to have access to information on consumers’ demand patterns so that they can adapt strategies to better respond to changing needs and trends, in particular for more sustainable products.

(4) Technological innovation: ICT

On the technology side, process innovation in the wholesale and retail supply chain and how to collect and make use of customer information are central issues. Data on shoppers can be used both in the store and in the back office. Online applications integrate both sides. An example is to add online services to products or making online buying possible. Retail and wholesale companies are users, not developers, of ICT. They will ask special developers for custom made applications, in order for distribution to be cheaper or to know how to sell better their products and services. Getting to know specific characteristics of a location is another feature in adapting better to the needs of the customers. Most difficult for future retailers is how to gather and analyse the customer information, in order to be used for better and wider commercialisation. Science and technology innovations in the retail and wholesale sector are mostly driven by the latest developments in ICT. This is why the role of internet and Web 2.0 is very important: it leads to disintermediation by eliminating wholesalers, but also retailers. At the same time, there is a reverse trend of re-intermediation adding new players to the value chain such as “infomediaries” (Van der Giessen et al. 2009). As van der Giessen et al. (2009) state, ICT has influenced the wholesale and retail trade sector drastically at many different levels and it belongs now to the largest investors in ICT equipment. The introduction of ICT features in the wholesale and retail sector has changed daily operations, marketing, customer relations and retail channels. Principally, the introduction of these features has made retail and wholesale more efficient, responding in part to the strong pressure to cut costs, (but at the same time by itself, accelerating this trend.

An important innovation in distribution channels is e-commerce, which also has a very significant influence on customer relations. Experts agree that ICT is the key for further development (van der Giessen et al. 2009). E-commerce includes B2C (business to customer), B2B (business to business) and C2C (customer to customer, e.g. eBay).

A further important IT-based innovation having a high business potential is radio frequency identification technology (RFID). Retail insiders believe that in the future, RFID will enable the retail sector to precisely document the route taken by deliveries in the “intranet of goods”. This is a company’s intranet to which participating industry partners are connected to call up product and process related data on goods tagged with responders. “Every time a shipment is registered by an RFID reader at any point along the supply chain, the relevant entry is automatically updated in the database. This enables authorised users to determine at any time where goods are located, what stocks are still available and which articles have already been sold. This knowledge can be used to further optimize their processes.” (Metro Group 2009: 14). Proponents of RFID use in retail state that greater process efficiency can be attained with this technology. Customers can rely on that the product they are looking for will always be in stock. The retailer’s IT systems generate a warning in case a product should run low so that the manager can order new goods in time. In addition, RFID makes many other innovations in services possible, e.g. retrieving information on a product such as its expiration date, place of origin, ingredients, information on food allergies or incompatibilities. Concerning the supply chain, RFID allows the retail companies to trace the route of goods deliveries, finding its current location at any time. RFID makes it possible to know when a shipment leaves the Europe INNOVA Sectoral Innovation Watch
Manufacturers warehouse and when it is going to arrive in the store. Labour intensive manual stocking is not necessary any more as stock can be counted by just pushing a button. Warehouse capacity can be used more efficiently and shortfalls can be avoided. The increased availability of goods might also generate higher sales and market shares in the long run. Furthermore, RFID prevents theft and helps control the expiration date, especially of foods. RFID applied in the supply chain can help avoid supply bottlenecks at manufacturers and retailers level, manage their capacities more efficiently and reduce delivery errors. Warehouse costs can be saved as manufacturers are able to respond to demand in a just-in-time fashion. Since every item can principally have an RFID, the recall of defect products is much easier. And it is possible to detect where defect parts of a product come from when they are tagged individually before leaving the warehouse.

(5) Intersection of technology and demand-side drivers

So far, we have considered S&T drivers and demand side drivers and their impact on the future development of retail and wholesale. These cannot always be kept apart. Thus, we will now turn to the intersection of the two categories of drivers and discuss their mutual influence and innovative potential. At the intersection of technology drivers and demand side drivers we find ICT supported tools to respond to customer demand and; at the same time the opportunities provided by ICT solutions offer new products and services to customers. Experts expect that ICT will help to better understand the customers, to further optimise the supply chain, to build closer relations with the customers, to design and offer customised products and services, to optimise shop floor operations, to increase efficiency, and to save costs. ICT and technological developments will also enable the provision of value-added services by wholesale traders (van der Giessen et al. 2009).

E-commerce. No other innovation has received as much attention from retailers, consumers and the general public as E-commerce and internet retailing. Online retailing is often hindered in the internal market because foreign traders refuse to accept orders from consumers living in another country (despite the existing Services Directive)\(^5\). Many industry observers see e-commerce as key to the retailing business going beyond offering another retail channel to the consumers. Internet and new technological applications as the RFID will support one-on-one relationships between retailer and consumer and enhance mass-customisation. At the same time the power of the consumer – at least in some segments - will further increase. This all will require full flexibility on the side of the retailer and the value chain (van der Giessen et al. 2009). New ICT developments are triggering new retail products, processes, relying on new technological trajectories. Those trends are nurtured by:

- mobile commerce,
- voice technologies,
- DAM (Digital Asset Management) and DRM (Digital Rights Management).

E-commerce and online shopping are based on components focusing on user-friendliness, improved service for the customer, such as creating and managing a web storefront presenting it in a catalogue mode, managing the search for and selection of merchandise by the customer, handling order and

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payment processes. There is a complex value chain involved in online-shopping that gets more and more advanced to support such activities as product selection, purchase, billing shipping and possible return of merchandise. Two of those features that are going to be more developed in the future are:

- **Configurators:** firms use configurator applications to speed the selling process, reduce errors in orders, and replace person-to-person selling with customer self-service.
- **Personalization:** is the ability to track customers and respond to them by drawing on knowledge of their current and past contacts, interests, and behaviour (Friedewald/DaCostas 2003: 41).

**Box 3.1 Enabling technologies for E-commerce**

**Collaborative filtering (CF)** is the process of filtering for information or patterns using techniques involving collaboration among multiple agents, viewpoints, data sources, etc. Applications of collaborative filtering typically involve very large data sets.

A **rule-based system** is a way of encoding a human expert's knowledge in a fairly narrow area into an automated system.

**Case-based reasoning (CBR)** is the process of solving new problems based on the solutions of similar past problems. Case-based reasoning is a prominent kind of analogy making.

A **neural network** is a powerful data modelling tool that is able to capture and represent complex input/output relationships. The motivation for the development of neural network technology stemmed from the desire to develop an artificial system that could perform "intelligent" tasks similar to those performed by the human brain.

A **content management system (CMS)** is a computer application used to create, edit, manage, search and publish various kinds of digital media and electronic text. CMSs are frequently used for storing, controlling, versioning, and publishing industry-specific documentation such as news articles, operators' manuals, technical manuals, sales guides, and marketing brochures.

**Web 2.0.** After the predominant strategy of many retailers to cut costs to the bottom line and introduce new processes such as ECR (see chapter 3) one focus was on “customer centricity”. This was to put the customer and her demands first and to undertake studies and analyse customer data to identify what the customer really wants. At the end of this process, some retailers were actually able to better store-level assortment, advance planning and offer some convincing customer loyalty programs. Interaction with the customer is supported by the introduction of the Web 2.0 technologies (Citino 2008). Applications of the so called Web 2.0 represent an additional intersection of S&T drivers and consumer demand. To some these applications might still be in their infancy or nothing but technical gimmicks. To others these are signs of future technological trajectories. Basically Web 2.0 applications in retail are associated with

- a higher degree of participation on the customer's side,
- a greater variety of goods (even goods that are seldom requested),
- making shopping an online experience by use of smart-client technologies
- the convergence of anywhere, anytime, anyhow supported by the technical convergence of mobile phones, TV and the internet (triple play).

Web 2.0 allows the direct contact between producers and consumer. Especially for information-based products and intangibles this means that the physical retailer is no longer needed (Constantinides et al. 2008). Web 2.0 is also discussed fulfilling the criteria of Customer-Generated Content (CGC): users do not use the web in a passive way but add value to the content of the Web. Experts have pointed out that direct customer involvement and CGC might result in powerful network effects and user communities (O’Reilly 2005). An acknowledged definition of Web 2.0 or Social Media is still being discussed. O'Reilly describes it as a new form of collaborative Web, a "platform harnessing collective
intelligence" (O’Reilly 2005). Constantinides/Fountain (2008) define Web 2.0 as “a collection of open-source, interactive and user-controlled online applications expanding the experience, knowledge and market power of the users as participants in business and social processes. Web 2.0 applications support the creation of informal users’ networks, facilitating the flow of ideas and knowledge by allowing the efficient generation, dissemination, sharing and editing/referring of informal content”.

It has to be pointed out however, that significance of Web 2.0 is quite contested among retail experts. Though more opportunities for user/customer involvement are opening up only a few specialized retailers make extensive use of these options (Reynolds 2004). One advantage for customers and retailers presented by Web 2.0 applications is the capturing of the “Long Tail”. This term describes all the goods that are hardly ever asked for and thus, sometimes hard to find. Retailers using modern internet applications offer next to their core products also those they usually do not have in their assortment. These rare products, however, can be offered by cooperative partners of the retailer. The websites of those partners or rather their assortment is thus offered via the website of the first retailer. Both have a benefit since one of them gets to sell a product and the other can still tighten the relation to the customer.

Participation from the customer is increased by special features offering the possibility to ask for certain products and to get a reply or even for the customer to be integrated in the design process of a certain product. New possibilities unfolding here are also discussed under the term “Social Commerce” or “Social Media”, e.g. T-shirt makers running an online-business and letting their customers vote via internet which pictures to print on a T-shirt. Customers can even introduce their own creations and the one how gets the majority of votes wins a prize (see for example www.threadless.com). The focus is actually more on the event of creating rather than purchasing a product. E-commerce companies are increasingly trying to integrate their users into every step along the value-chain of the process. This includes suggestions for new products by online users, product developing by consulting online users, rating on products, asking for comments or additional information on products, getting support for setting up a shop (Schnieders 2004).

The new dimension supported by some Web 2.0 applications is the visual experience, the customer’s ability to interact with the retailer’s website. Special web designs are made possible by enabling technologies based on Rich Internet Applications (RIA), e.g. XML, AJAX, Flex. RIA makes user experience in an online store more attractive and engaging. Customers can go from website to website or from one store-shelf to another without having to wait for a page to refresh (Jain/Ganesh 2007). Early adopters of RIA are GAP and LL Bean, followers are Nike stores, Panic and Etsy.

Retailers have realized that they have to make the internet user an online customer and this is only possible if retailers accept the way users communicate on the web. With all the new web-enabled devices used at home and on the road such as WiFi laptops, mobile devices consumers have made the web part of their social fabric. Retailers have started to make this social fabric a part of their instrumentation (Swoboda et al. 2009). Constantinides et al. (2008) differentiate three dimensions of Web 2.0 (see Figure 5). Application types include product reviews, blogs, partnerships with social
networking entities such as MySpace, Facebook, Second Life, etc. (see also Citino 2008). The diagram is not exhaustive. Additional features could fit in the categories as well.

Enabling technologies for these new services with content from multiple sources comprise, for example mashups. These data sources can be the retailer’s proprietary data combined with web feeds or public sources, e.g. information on products, test results, location maps, etc. (offered by Flickr, Google, Ebay, Amazon). The combination of such services with the retailer’s website is called user collaboration. According to the diagram below, these would fit into the category of applications. By inspiring the users and customers to engage in a dialog with other clients, the retailers can create a community for their products and connect to the social web (offered by Amazon, Ebay). An additional functionality is offered by a live agent chat, especially if the customer is making an involved purchase online (the German online store and catalogue retailer Otto offers such services, see box 5). The live agent can answer in real-time special questions on the products, product applications and services attached to it. Voice over internet protocol (VoIP) supports this feature, e.g. powered by Skype (Jain/Ganesh 2007). VoIP is offered by eBay but aside from this company only rarely found so far.

Wikis are web pages that can be edited by multiple authors, allowing collaborative publishing. Widgets are mini computer programs to be used as a graphical user interface. They integrate information from other web sites, e.g. the integration of YouTube films into a retailer’s website.

Another enabling technology, RSS\(^7\) feeds, can be used by online retailers to effectively expand their reach. RSS are subscription-based data feeds. Once a customer subscribes to the feeds, the feed reader automatically retrieves content from the source. This happens even when the customer is not visiting the online store. RSS can add value by communicating the launch of new products, promotions, store openings, additional product information and multi-media links (supported by Tesco, Amazon, Sainsbury’s, HMV). Additional features can be transmitted by podcasts and video casts which are an effective means of communicating product features, usage, product comparisons etc. to the customer (promoted by HMV, Sainsbury’s). Even more advanced is the Semantic Web which can enable the retailer to show search results of related, associated or complementary products or services. This enables up-selling and cross-selling opportunities (Jain/Ganesh 2007).

It is contestable to what degree Web 2.0 usage from the customers’ side contributes to “empowerment”, “democratization” etc. As there are no categories to measure these effects empirically and scientifically sound they should be used with care. After all, the goal of retailers is to maximize profits – no matter if the goods they want to sell are created with or without customer participation. One effect of Web 2.0 though is that it enables the creation of user communities and the exchange of information that at some point becomes uncontrollable by retailers (see Constantinides et al. 2008). Customer-to-customer trusted information exchange also enables buyers to recommend products or to discuss their quality. Some companies even make use of these customer-to-customer conversations in another way: Crowdsourcing is the term for an effect of outsourcing: It describes the phenomenon of customers taking over formerly generic company activities (e.g. select motives for T-shirts), bringing the products closer to the demand of the customers. Two examples of crowdsourcing

\(^7\) RSS: Rich Site Summary or Really Simple Syndication
are demonstrated by LEGO and by Procter & Gamble. Lego released its firmware for LEGO Mindstorm as open source so that users can program their own Lego microprocessor. The director of LEGO Mindstorm expects new advances in robotic development to be shared with the community. Members of the Proctor & Gamble Tremor community, consisting primarily of teens, provide their ideas for developing product ideas such as new video games and marketing programs targeted at teens (GCI et al. 2006).

A study conducted by Infosys in 2007 among e-commerce retailers and their Web 2.0 applications concludes that very few retailers like Amazon have taken the lead. Amazon uses a combination of tools that leverage consumer experience without frustration and the tools match each other. Most e-commerce retailers surveyed need to catch-up. The implementation of tools that increase reach to consumers, maximize conversion, or support consumer loyalty lurk risks as some business benefits are easily quantifiable while others are intangible. Besides, there is always a security risk, especially on behalf of Ajax-based web pages (Jain/Ganesh 2007).

Interestingly, the majority of retailers making extensive use of Web 2.0 features are large companies (Constantinides 2008). Körber suggests that the traditional bricks and mortar businesses with their long standing expertise in logistics and with solid financial backing are in the best position to become the key players in e-commerce in the future (Körber 2004).

Customer relations management. Other interactions of demand-side drivers with science and technology drivers occur at the front of customer relations management (CRM). CRM comprises the objective to establish and maintain a long-term relationship with the customer in order to have satisfied customers and ensure the long-term success of profit maximization of the company. In narrower terms, CRM is often defined in terms of the technologies involved, especially for methodologies, software, databases and internet capabilities that help an enterprise manage customer relationships in an organized way. CRM aims to provide the necessary knowledge and technologies for the retailer's proposition to reflect individual customer needs. Though certain forms of CRM have always existed as long as retail exists, the term was created in the 1990s, giving rise to several approaches that were often too abstract to be implemented into the value chain. In the subsequent phase software tools like Siebel were introduced, social relationships, however were neglected. Finally in the third phase we witness a differentiation of “schools” taking a holistic approach and combining the human factor, process organization and IT. Today and in the future CRM is relevant where ever customers are involved. CRM is an approach to be in a continuous dialogue with the customer, to get feedback on product applications and quality, to improve products and services and to customize products according to individual needs. Modern CRM approaches make use of software tools to efficiently combine the following levels: interaction, cooperation, information, integration and transaction. This might sound simple, but as a matter of fact turns out to be very complex. Software solutions like data warehouse in the 1990s took too broad an approach, generating tons of data that no one could handle. Data mining tools are developed to solve such problems: reduce the amount of information to what is really necessary (Buser/Welte 2006). CRM is seen as a set of tools and techniques that allow the retailer to focus on developing customer profitability and allows a more targeted use of marketing and operational resources. Customer activity can be tracked to facilitate continually relevant retail
development and CRM activities can be very effective in enhancing customer loyalty for profit when the tools are applied according to overall strategies like loyalty marketing strategies (Cuthbertson and Laine 2004).

3.2 Sector scenarios

The following sections depict five different scenarios for possible future developments within the wholesale and retail trade sector in Europe, highlighting different directions in consumer preferences and choice as well as developments forced by a small number of powerful players within the sector. Important drivers discussed have been fed into the four scenarios that follow. The scenarios were developed in two workshops. Each scenario is a different version of what main parts of the retail and wholesale sector could look like in the future. Each scenario is a plausible, internally consistent, possible future, reflecting combinations of the desirable and less desirable outcomes that will be a feature of most future trends.

Scenario 1: Big boxes everywhere & green big boxes everywhere

Big boxes everywhere. Discounters, supermarkets, hypermarkets, and the retail chains are everywhere. Because of the limited number of retail chains the city centres across Europe are looking more or less all the same. In the outskirts of towns large supermarkets are targeting car owners. Retailers are entirely in the lead of what they offer in their ‘big boxes’ (that also can be small boxes of big retail chains) and they define what producers have to produce. Retailers are focused on providing relatively low cost options, achieving economies of scale and bundled products and services. The chains develop their own brands, most producers are therefore invisible, some other trusted brands have survived and prospered. Low income areas are growing, containing residents with low mobility and without access to good quality, multiple food retailers. The economy is rather uncertain; to open a small business is difficult due to the lack of competition. Income inequalities remain high. Most people expect companies to invest in infrastructures required to solve environmental and social problems, and don’t feel a duty to change their ‘convenience seeking’ and consuming oriented lifestyles in order to do so.

Trends and drivers, products and services. Time-saving shopping and consuming combined with standardised and often low cost options are the main drivers that make the format of “Big boxes” successful.

- **One shop for everything – supermarkets as service providers.** Big boxes are offering all services from cradle to grave in a standardized form. Telecommunication, energy, water, insurances, financial services, healthcare, event management like wedding planning, holidays and lifelong learning is provided by international players and offered within the Big Boxes. Some Big Boxes are surrounded by company villages, where customers can buy or rent houses and flats and will be part of the community of their favourite Big Box Company.

- **Saving time for cooking and substituting healthy living by consuming functional food.** Big Boxes are offering not only ingredients but also whole meals for delivery. Functional Food and personalised health products for every particular condition are available.
• **Buying services related to products.** Clean houses, clean clothes, healthy diets are offered as bundles of products and services. Customers buy packages including personalized products and they can upgrade the product packages with services including home visits by personal trainers and trained staff.

**Opportunities.** Big boxes everywhere gives options to get everyday goods at low prices. Production and distribution are efficient and the high competition between retail chains forces the retailers to lower costs.

**Risks.** Hypermarkets, but also supermarkets, limited assortment discount stores and other retail chains offer a reduced choice that is focused on costs and standardization. The market concentration is high and makes market entry for new suppliers difficult. The producers are dependent on one or a few large retailers who are cutting the prices constantly. The exploitation of this situation results in exploitation of the workforce itself. The low price competition makes the necessary investments in environmental friendly retail nearly impossible. The further retail trade concentration manifests itself in different ways. On the one hand, there is the increase of large retailers which are usually linked to integrated supply chains such as discounters, supermarkets and hypermarkets. On the other hand there is the spread of vertically integrated chains dominated by companies which control retailing through contracts (dealerships, franchises) or ownership (branch networks or chains) – for example in the clothing retail sector.

**Green big boxes everywhere.** Discounters, supermarkets, hypermarkets, and the retail chains announce annually their large investments in greening products, services, processes and retail sites as well as their investments in renewable energy. The comparability of efforts in sustainability is high because the measurement of environmental impact and the different dimensions of sustainable retail are standardized and improved on the European scale. Regulation and strong local consumer initiatives have achieved that retailers and chains include local products into their assortments. Agreements on how to include local products into the assortments are part of approval procedures, so retailers compete for the most sustainable solutions that support local development.

**Scenario 2: Local markets – connected through the web**

Local markets are strongly based on products that are possible to produce locally. Local supply chains are supported by local governments and European regulation and incentives, ensuring local communities continue to benefit economically and socially. Because of strategies to reduce environmental impact and ensure continued economic support of farmers and local communities everywhere, local communities in Europe are interested in direct trade with developing countries. There is more local community based trade between communities in different parts of the world aiming at bypassing established retail supply chains. The fair-trade movement has developed further and established (in co-operation with consumers and producers in Europe, Africa, Asia and America) modern communication networks and platforms to develop their own, independent links. Through these web-based networks a worldwide community of local market actors is organizing trade, optimizing logistics, sharing knowledge on crafts, green production and cooperation. Brands are less
powerful, but labels that ensure high standards in regard to environment-friendliness and good working conditions are popular.

**Trends and drivers, products and services.** High transportation costs combined with high awareness in sustainability issues and new forms of online-cooperation are the main drivers that make the format of “Local markets” successful.

- **Local exchange of goods and services.** At local goods exchange, local producers are provided with affordable space for them to store items for resale or exchange both online or offline. Web 3.0 online tools provide a live inventory of total stock on hand so customers can see immediately what they can buy and consumers can also state online what they want to buy so that local producers can make an offer to individual costumers.

- **Web-based global networks of local market actors.** Web-based global networks of local market actors facilitate the exchange of goods directly between different regions. These global networks help local communities leverage greater buying power, and trade local products with others. Online portals are sophisticated and flexible, using a wide range of tools to exchange goods, experience, and build up co-operation.

- **Community farms and community crafts.** Local markets and local stores are offering products from community farms and from local production sites.

- **Everybody can be consumer and producer.** Advanced online services allow everybody to sell their surplus food and energy. Growing fruit and vegetables and producing energy are widespread local practices and through advanced online community matching services it is possible to link supply and demand across and between local and regional communities. Mapping applications on computers and mobile phones allows consumers and producers to track goods for sale and transportation possibilities (advanced ‘hitchhiking’ service for goods and persons).

**Opportunities.** Local companies and local entrepreneurs benefit from local markets where market entry is easier for them. Local retailers and service providers can bundle products and services alongside the regional competencies and demands. Direct communication at the local level offers more immediate and direct consumer feedback that could be used by to further develop local retail formats. Local markets could support the development of alternative supply chains and networks which provide rural development opportunities and enable local communities to stay in their rural areas.

**Risks.** The society is more diverse and fragmented. Local communities are strong, whether rural or urban, some of them integrative and open, others affluent and gated, or poor and closed. Some local markets are mainly based on the traditional strength, values and skills of traditional residents others are evolving for the reason of origin, shared preferences in lifestyle, or religion. As a result society as a whole is less cohesive and there are significant sectors of society affected by poverty. This development slows down innovation and reduces productivity growth.
Scenario 3: The digital consumer & green digital consumer

Digital consumer. In the digitally advanced European countries, shopping takes place through e-commerce. In the always online society life is digitalised and there is no distinction between virtual and physical lives. Online shopping and physical shops are combined in new ways: Companies are presenting their products online and they organize shops and events where consuming and shopping is embedded in spectacular events. On the other hand, tools for virtual experience have been developed and consumers can learn about products from the experience of interacting with objects, people, and the environment.

Trends and drivers, products and services. Increasing interconnectivity in the ‘always on’ society combined with the increasing availability of goods and services on the internet are the drivers within the scenario of the “digital consumer”.

- Limitless consumption and the emergence of a “social life of consumption”. The always-on digital business world and the corresponding acceleration of business practices allow consumers to satisfy their needs faster, more easily, and with fewer barriers. Retailing is not restricted by time, geography, location, and physical store capacities. In the digital economy, retailing is unlimited by these restrictions. Digital technology enables consumers to more easily and rapidly connect with each other, wherever and whenever they want, through email, mobile devices, or platforms such Facebook, eBay, Xing, Twitter and LinkedIn. Consumers increasingly connect trade, and share goods, services and information with likeminded people across time zones and geography. The spread of peer-to-peer communications and content extends and reinforces social networks and builds new virtual communities. Retailers are constantly developing strategies to find access to this kind of communication.

- The rise of niche products. Online communities and the diversity of information flow within social networks enables consumers to more easily participate in specialized interests and hobbies. Within the rising social networks they gather in niche communities of likeminded individuals, which results in increasing demand for specific and customized products and services.

- Digital natives are consumers and producers. Digital consumers are using the internet to do things themselves, they are trading peer-to-peer or ordering directly from suppliers and independently. They will provide assessment and information on goods and services to other consumers and to producers and retailers. Consumers become increasingly involved in the creation of the products and services they purchase. This process may offer the opportunity to shift the balance of power from producer to consumer. Individuals are more involved in specifying, creating, and customizing products and services to their requirements and retailers are the ones who can use the information flows to mediate between consumers and producers.

Opportunities. Producers of niche products benefit from the rise of the digital consumer because they get easier access to consumers and they can use the new opportunities of social networks. Online
Retailer enable rapid consumer feedback and rapid innovation and the growing use of the online retail by consumers and retailers enables the development of hybrid business model combining virtual and physical market presence.

**Risks.** With the rise of search engines and social networks consumers may experience an "information overload" and lack of proper information could have adverse effects on those consumers with weaker educational background. E-commerce may not cover local demand and with the rise of retail-relevant giant internet-services that were established outside Europe (Google, Amazon, Facebook, Twitter, Second Life) European producer, retailer and wholesaler are dependent of innovation outside their scope.

**Green digital consumer.** Online commerce has grown exponentially and digital consumerism has become green because regulation is high and also many people can afford green and socially sound products and services. Intangible values have become important, such as sustainability, creativity and to have free time on one's hands. Retailers have realised that it is important to cater for these needs and offer various options within the existing low carbon retail regulation framework: The Ecological Footprint of items, individuals and the communities, where they are part in, is always visible on their screen. With online tools consumers are able to calculate the impact of their individual decisions and their general buying behaviour. They also get advice how they can improve their habitual buying behaviour in regard to ecological and social sustainability goals. To ensure the on-going improvement of standards for sustainable consumption, European Policy makers are working closely together with consumer organisations, retailers, manufacturers and the logistic industry. To ship products in a more eco-friendly manner and limiting the negative effects of e-commerce on the environment is prompted by governments as well as driven by customer demand.

**Scenario 4: The rise of lifestyle stores and malls**

People are mainly searching for a stimulating shopping experience. This could be provided by everything from an onsite eco-farmers' market to a blend of high-tech entertainment and shopping facilities. Lifestyle shopping malls can include one or more buildings forming a complex of shops representing merchandisers that represent the special lifestyle. These malls can have the traditional mall architecture with interconnecting walkways enabling visitors to easily walk from unit to unit, but they can also be located for example in revitalized industrialised buildings or around traditional market places. Different groups of society have different core values. This leads to a manifold of lifestyles, for example: Green malls offering green products and services (from eco-friendly all-inclusive tours to alternative medicine), religion orientated malls, ethnicity based shopping centres, high-tech oriented malls or sports oriented malls. The theme is so strong, that products that do not fit it will not be found in the stores. The diversity of stores and services lies in the fact that every core value is offered in a different store, with possibly a different concept.

The key issue for a wholesale or retail company is to identify a lifestyle with considerable market opportunity. Small companies are able to very specifically serve the needs of specific groups. Bigger retailers can develop a concept, as different cities in a region or even worldwide have similar lifestyle
groups. For lifestyle stores the innovation theme is the customer experience that can be offered to (a group of) customer(s).

**Trends and drivers**, products and services. Providing more customer choice to meet changing lifestyle preferences is the defining driver in the “lifestyle store” scenario.

- **Buying sustainability and buying fairness.** Instead of changing their lifestyle consumers want to meet their needs without damaging the environment and without supporting extreme forms of exploitation. Consumers with a lifestyle of health and sustainability (LOHAS) will buy carbon neural and ‘zero impact’ products ranging from lemonade to shirts to heating systems.

- **One-stop lifestyle oriented service shopping.** Consumers will experience specialized lifestyle oriented shopping villages or shopping malls. High-tech oriented consumers can get whatever they want in their High-Tech mall. They will find intelligent clothes, the latest digital devices in their mall, they can also go to their high-tech hairdresser, can eat in a high-tech molecular cuisine restaurant and visit some virtual reality exhibitions. Lifestyle oriented retailers and service providers will develop concepts of an overall consumer experience to meet the desires of specific consumer groups.

- **Design your life by designing your own products.** Consumers can put their own personal touch on a whole range of products and services. They can order cereals to meet their particular nutritional needs or ailments, soap bars with their own specifically requested scent, they can order online clothes in the style of their favourite celebrities that fits perfect. Usually they are ordering through the web, but they can also order or via a personal consultation.

**Opportunities.** Consumers benefit from lifestyle malls because they receive greater diversity of choices in one place and they can get new combinations of products and services based on their specific lifestyle. Retailers and service providers can bundle products and services and it is easy for them to further develop their products and services because they act in a setting, where they share core values of production and consumption with their customers and the companies they are surrounded by. Consumers get added value through more customised offers and there could be an increased consumer satisfaction from the creative involvement of customers in the development of services and products. The lifestyle oriented agglomeration of producers and customers could give new market perspectives for specialized producers and services providers that would otherwise not have access to a sufficient quantity of partners and potential clients.

**Risks.** The result of these trends could be an intensification of socio-spatial segregation and a differentiation and polarization of lifestyles between different groups of society. There is also the risk of drifting apart of social groups and that higher selectivity in the new consumption environment will stimulate fragmentation in the public space, leading to the decline of social cohesion. This kind of fragmentation could threaten democracy in that it prevents people from sharing public places and from spending their shopping/leisure time in a diverse environment and instead ‘retire’ from diverse public places with different lifestyles. In this way this kind of differentiation of retail and wholesale alongside lifestyles can lead to separated production and supply chains.
**Scenario 5: The supermarket as a public good**

The supermarket as a public good is owned by society not by any individual or by a company. It pursues democratic value and gives more freedom of choice to the consumer – but also more responsibilities. It sets out on the participatory power of the consumers. It operates not primarily to maximize profits but to fulfil ethical values and to support the reshaping of society towards more sustainability and societal soundness. Those values have to be defined by the consumers of the supermarket in consensus seeking procedure. Since the supermarkets attract mainly local customers, the inhabitants of the local area around the supermarket are invited to participate in such a format.

**Trends and drivers, products and services.** Ethical values are one aspect. Buying products en gros from suppliers who can be private enterprises is organized in a transparent way. Products have to meet criteria such as locally produced/grown, fair trade, produced according to ecological-dynamic standards and certified, high quality, healthy. Another aspect is transparent information. Decisions on what is to be sold in the supermarket and from where these commodities are being purchased are based on transparent information that are provided to all consumers. Modern IT solutions via Internet, mobile phone, etc. help to provide such information and support discussion groups. But information is also provided in the supermarket. Each product has a code that can be read by the supermarket trolley and a display on the trolley provides this information. This information contains background knowledge on the production process, ecological impact of the production process, recycling options, etc. This includes also information on the societal impact of the goods’ life cycles, e.g. the impact on workers producing this good. Questions and ideas for improvement or new items and services can be fed into a special computer in the supermarket are communicated directly to employees who provide a special customer care service.

There are different modes of payment in the supermarket. Next to the conventional way to pay for individual purchases cash or by debit card, customers can also give the supermarket a credit at the beginning of each month and the purchases are deducted from this credit. The customer may get a special bonus for her credit but this is not related to the amount spent for the purchases. An alternative way of payment besides money is to work in the supermarket for a few hours each month; this includes also delivery services to customers who are not able to come to the supermarket personally.

The organisational form of this modern supermarket is similar to a cooperative. However, it is not owned privately but a public good. This form is legally grounded, based on national law. It is governed as a commons, according to the principles of basic democracy. The legal framework for the governance of the commons is established by a public referendum or if necessary by several referenda. Instead of profit maximisation, the success of the supermarket is measure done the basis of a common welfare balance sheet. The operative objectives of the supermarket are legally grounded. They entail for example social and ecological responsibility, democratic organisation. Those supermarkets that submit the most satisfying common welfare balance sheets well have advantages

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1 This scenario was not discussed in the Innova workshop in June 2009. It was inspired by an interview with the Austrian spokesperson of attac, Christian Felber, and adjusted for the purpose of this Foresight by the authors.
such as paying less tax, getting credit for lower loans, being preferred for public procurement. The criteria for “common welfare” have been established beforehand by public “Convent for the Economy”.

Each supermarket is governed locally. That means that the local consumer group decides not only on the criteria for goods to be purchased and sold but also on personnel matters such as nomination of the supermarket CEO. The director is installed according to her/his competence. The consumer group exerts controlling power on the director and operational affairs of the supermarket. The director has to justify his/her business practices toward the consumer group. He/she can also be displaced by order of the consumer group.

**Opportunities.** Consumers may benefit from the supermarket as a public good because they can make the experience to take their life into their own hands. This kind of supermarkets could keep the key collective function of providing a place of social integration at the local level. As part of community building at the local level it could serve as a mechanism supporting social cohesion. It could lead to more socially and ecologically conscious consumption and force all companies alongside the supply chain to ensure transparency.

**Risks.** The activities of retail and wholesale companies would be restricted and the pace of innovation could be slow due to the fact, that consumers do not have information on new developments. The positive discrimination of a special retail format could discriminate other retail formats and also other groups of society that have other consumption priorities and other values.

### 3.3 Future innovation themes and linkages to other sectors

Emerging innovation themes are strongly related to internationalization, to changes in consumer demand and to ICT support to find solution for these new demands. This is not to say, however, that innovation themes lay mostly on the technology side. Quite on the contrary, most innovation themes, new products and processes are related to organisational and service innovation. Innovation themes do not only touch the organization of retail but also the structure of the companies and of the sector. Since “hard technologies” are predominant innovation themes, it is sometimes difficult to distinguish whether a new type of retail is a new strategy or a new product. From the perspective of the Europe INNOVA Project, there are also some linkages to the developments of the food and beverage sector, the textiles and clothing sector, the construction sector, and the opto-electronics sector.

The discussion on demand side innovation drivers and science and technology drivers as well as the scenario framework leads to a number of innovation themes for the future – within a ten-year time horizon. A main/central feature is the increasing necessity and ability for retailers to act as a ‘butler’. The retailing entrepreneur is focussed on how to maintain a relationship that satisfies the customer, so he or she will return. The needs of the customers are the central issue and information technology makes it possible to better manage different information streams. Most of the innovation themes are related to this ‘butler’ idea. They are focused on better serving the needs and wishes of the customer:
- **E-commerce** is using (new) Information & Communication Technologies as retail channels to the consumer. Many applications are possible, ranging from online sales to online research. E-commerce is clearly driven by technical possibilities, but from thereon, it can focus on cost, choice or convenience, depending on what the customer wants.

- **Personalisation** can both be achieved through technological possibilities as by downsizing. Data on shoppers can be used to ‘getting to know’ the customer. But this idea is always based on the retailer who really knows his customers by talking to them and recommending (or advise against) certain products/services.

- **Customer experience** is an overall theme. It can be about satisfying the customer as much as possible or about attracting him or her to a certain shop or website.

- **New services** developed by retailing companies are for these companies an important possibility to expand their market share. New services mean differentiating activities and therefore more innovation.

- **Vertical integration** is about companies expanding their activities into other parts of the value chain. For retailers this means distributing and producing themselves.

- **Retailers as public service providers** are interesting expansions on the new services theme, For instance retailers providing services like healthcare and security. Central in this discussion is the legal framework.

In the following we shortly summarize the key challenges for innovation in wholesale and retail, including the linkages across sectors.

**Sustainability**

Big boxes, local markets, digital consumerism, lifestyle stores and the supermarket as a public good face to a certain extent the same challenges: Because of its broad reach, the retail sector has the potential to effect significant change in society in a way that other sectors hardly can. Therefore, sustainability is not one driver among other drivers, but was seen at the first workshop and at the second workshop as a driver for various retail formats (see: excursus on sustainability as innovation theme and the requirements for greening different scenarios, p. 60).

The long-term relationship between environmental performance and economic performance is controversial. On the one hand this relationship is been seen as contradictio in adjectio and on the other hand both dimensions are seen as two sides of the same coin. One view is that improved environmental performance mainly causes extra costs for companies and therefore reduces profitability. Another view is that improved environmental performance would reduce cost and increase sales and is therefore improving economic performance. The kind of environmental management seems to play an important role and there are different ways corporate environmental management focuses on increasing revenues. One way is to support market research, product development and market positioning with an eco-marketing and communication approach to be acknowledged as leading in this field. Another focus is to optimize production processes to reduce costs. In this case environmental management tools can supports the identification of eco-efficiency potentials and the implementation of measures to increase eco-efficiency. Identifying cost minimising ways of clean
production and environmental protection needs to explore and compare alternative technologies, to establish environmental cost accounting, investment appraisal and to introduce environmental information management systems to compute and analyse process data and also to establish eco-control systems for the implementation of efficiency measures (Schaltegger and Synnestvedt 2002).

Others argue that economic growth almost always implies the use of resources, especially non-regenerative ones, and therefore contradicts climate goals and better environmental performance. Instead of striving for more economic growth, the limits of growth and alternative values for the economy have to be considered (Felber 2009). The scenario “supermarket as a public good” which can be interpreted as a new lifestyle store might be an approach in this respect.

**Personalization**

Personalization is an issue resulting from the S&T opportunities (cf. page 54) and the demand-side drivers like changing life styles. As an innovation theme the issue of personalization is located at the interface of specific products (e.g. customized computers, automobiles, clothes, and insurances), technologies (configurators, cf. page 54 f), and organisational changes (e.g. using personalization software). Personalization as the ability to track customers and respond to them in an individualised, personalised fashion on the basis of their current and past interests, contacts, and behaviour can be organized online (in the scenario “Digital consumer”) or through personal communication channels (in the scenarios “Local markets”) or combining both forms (in the scenario “Lifestyle Store/Mall”). Building a relationship between retailer and customer means getting to know what customers like and, equally important, dislike, then ensuring they get what they want. If an online retailer can analyse customer data and use the results to offer products that a customer wants, also advanced technologies are still based on the know-how of traditional retailers.

**Product assortment planning**

One of the most important problems facing retailers is the challenge of getting the right products in the right quantities to the right stores at the time that customers want it. It is difficult to predict what customers will want because they enjoy flexibility. Consumers have to predict their future utilities, which is considerably more difficult than predicting immediate utilities. Their preferences may change over time. Too much choice can be frustrating and confusing, so retailers try to balance having a wide enough assortment that consumers do not shop elsewhere, but not so wide that they are overwhelmed. In addition to the difficulties inherent to providing consumers with what they want, retailers face their own constraints, especially the physical space available in their stores and the amount of money they can spend on inventory. The most strategic decision remains the variety decision, that is, how many and which categories to carry (Grewal, Levy et al. 2009, S. 6). These product assortment planning decisions (PAP) are based on a multitude of often unrelated factors, and the ability to take all these factors into consideration simultaneously is an innovation theme that is different for different retail formats but crucial for economic and environmental sustainability.
Logistics and supply chains

As one of the large producers of CO2 emissions, the logistics and transport industry will find itself in a difficult position and under close scrutiny. The rising price of oil and the demand by customers for ‘green supply chains’ will require high investments in technological and organizational innovations. ‘Intelligent’ low CO2 solutions have to be adopted in the different retail formats (cf. Deutsche Post AG).

Customer experience and event shopping

Different retail formats attempt to revitalise shopping by dramatizing the ‘retail experience’. They try to capture shoppers’ imagination by inviting them to participate in simulated forms of non-shopping entertainment, such as sports (Nike Town), interactive installations, or even wilderness’ (trekking gear stores) and ‘nature’ (farms). So far these spaces are described mainly by the rubric ‘entertainment retail’ (or Disneyfication) when selling an easily recognisable brand name like Nike or Sony. Up to now competition among cities and corporations has led to a multiplicity of standardised attractions that reduce the uniqueness of local and urban identities. But especially urban cultural diversity leads to the paradox of polarisation: while cities become more like other places, they continue to attract the extremes of poor, migrant and footloose urban populations and also the rich. Their ability to change urban lifestyles continues to be the city’s most important driver to create new forms of consumption (Zukin 1998).

Retailers will have to develop operating models aimed at improving customer experience. International players are trying to ensure a local touch, lifestyle store will develop unique and very specific environments that represent the values of the customers, and the digital consumer of the future could get specific consumer experience by tools coming from virtual reality or augmented reality.

Efficient Consumer Response

One major organizational driver for the wholesale and retail sector supported by innovations in ICT is “Efficient Consumer Response” (ECR). ECR is a customer-oriented and integrated tool for supply chain optimization in which all parties involved work together. The primary aim of ECR is to create the tools and technologies for cooperation between commerce and industry for a better fulfilment of customer needs. ECR implies a complete integration of information and supply chain with the implementation of new processes for commerce and industry. This means for example that orders will be generated with modern information technologies from sales data of individual products. These orders are adapted to the consumption of the products (“selling to the scanner”). Insiders demand a fundamental change of view for the successful realization of ECR. They think that the confidence between the cooperation partners is the main prerequisite for an implementation of ECR. ECR requires department-spreading responsibilities for the control of the flow of goods and implies organizational changes on the supplier side and the commerce side.

So far, mostly deployed by large and multinational companies, SMEs are increasingly catching up. Major investments for the company’s ICT are required to integrate this feature into the supply chain.
One challenge for the future is to find solutions for ECR even for low-scale products to optimize continuous replenishment and customer relationship management. The introduction of mobile end-products in combination with the internet promises a fair-cost integration into the existing information systems and work organizations of SMEs. Logistics providers serve as the nexus between manufacturers and SME retailers, providing not only for the distribution of goods but also for billing, ordering and commissioning.

ECR works similar to a standard platform. Dating back to the 1990, this movement responded to rapid advances in ICT, shifts in consumer demand and the globalization of goods distribution across nations. It was supported by government’s initiatives such as the European market. At global scale the Global Commerce Initiative (GCI) was founded to adapt common methods of operations for business to other continents. According to Bell and Cuthbertson (2004), GCI is a “voluntary platform to improve the performance of the international supply chain for consumer goods through the endorsement of recommended standards and key business processes. It builds on the Foundations of the regional ECR initiatives…” (p. 65).

Besides these technology-based processes there are also a couple of new services or service combinations that could be labelled as a new product. Some supermarket chains are trying to compete not only in terms of price and quality of food (freshness) but also with additional services: delivery, gastronomy (freshly made ready-to-go dinners), catering. They are changing from plain retailers of goods to service providers and offer in their stores dry cleaning services, photo development, shoe repair, some also include postal services since this sector is getting more liberalized. Some specialty stores offer child care and the booking of trips.

At the intersection of new products and new firm strategies we find some innovative discounter. As mentioned above this retail type usually profits from the limited variety of goods that comprises their basic stock, but they tend more and more to offer goods for a limited period of time that traditionally does not belong to their assortment, e.g. food stores offering clothes or books, consumer electronics, even travel vouchers, photo development, mail order flowers. So there is a penetration into other retail areas. One case in point is Tchibo, traditionally a coffee shop chain, which offers household goods, consumer electronics, etc. and vacation trips at discount prices for limited time periods. Aldi, the traditional German food discounter which has expanded into many European countries and overseas is already ranking no. 6 among the German clothes retailers (p. 54). Experts estimate that discounters will continue their success.

Besides new products and services there are also some logistic process beyond ECR that need to be considered by retailers. Logistics and distribution scenarios tend to favour more centralized options for distribution to yield greater supply chain efficiency. In terms of speed companies have demonstrated that they are much better at achieving acceptable lead times to their customers, but compressing supplier lead times is much more difficult.
ICT challenges

Today there exist an abundance of software in retail as actors along the supply chain use various kinds. This makes collaboration sometimes very difficult, especially after mergers and acquisitions and supply chains with different software are to be integrated (IBM 2004). New challenges for data collection can also be summarized under the headline of data fusion. This includes the compatibility of data generated in one system and being read and transferred to another system. This can be important for the introduction of new features into older systems or when a new supplier using different systems enters the supply chain. Standardisation is needed. One solution can also be the use of an interface to make data compatible to the introduction of standardized software products instead of using proprietary solutions. Data mining needs to be further developed to analyse the data collected and to advance customer profiling. This requires tools that are capable to interpret the data gathered and to setting them in relation to data gathered on other customers or customer groups. Connected to this are intelligent reward and loyalty schemes, thus automated functions that offer special prices or products to loyal customers. Software tools for customer profiling have to be able to analyse customer behaviour, give scores according to the benefit of the retailers, and interpret this for future sales and product demands, distribution etc. Close related to such rating and reward systems is personalization. Here, self-learning systems are challenged to recognize a customer by her behaviour, relate this to similar patterns and in the end make up-selling and cross-selling possible. Trajectory analysis can give account of a customer’s search and selection behaviour.

Not only is the online customer in the focus of new software technologies but also the costumer who visits the store. Some basic research is needed to improve the awareness of the customer’s social behaviour. Neuroeconomics, for example, combines neuroscience, economics, and psychology to study how people make decisions. It looks at the role of the brain when we evaluate decisions, categorize risks and rewards, and interact with each other. One step further towards application is the neuromarketing - a new field of that studies consumers’ sensori-motor, cognitive, and affective response to marketing stimuli. Researchers use technologies such as functional magnetic resonance imaging (fMRI) to measure changes in activity in parts of the brain, electroencephalography (EEG) to measure activity in specific regional spectra of the brain response, and/or sensors to measure changes in one's physiological state (heart rate, respiratory rate, galvanic skin response) to learn why consumers make the decisions they do, and what part of the brain is telling them to do it.

In order to present the store as real-time walk through and display the goods in an appealing manner, online stores have to implement 3D design applications. For a visit in a brick and mortar store immersive visualization tools can support the customer to match new furniture into her apartment style at home which she sees virtually in special glasses or 3D-monitors.

Security and theft prevention are additional topics to be tackled with modern technologies. CCTV and RFID can be used to prevent theft from customers and employees because these technologies allow the monitoring and tracking of people and goods. Store environment simulation can improve energy efficiency in a store. Some of these technologies may pose severe infringement of customers’ and employees’ privacy. Some scandals came to the fore recently in Germany where the discounters Lidl...
and Schlecker have illegally surveyed their employees. The line between legal surveillance and infringement of personal privacy is often not clearly defined as modern technologies and their implementation are a step ahead of legislation. This is definitely an issue for institutional requirements.

**Organisational innovations**

As Reynolds puts it, the retail sector has been rather slow to adopt business strategies. Today, retail strategies react to the most important structural trends such as large organizations running most of the retailing in western economies and expanding in transitional economies. Strategies have to be designed to support retailers with growing larger and faster than their competitors, being different from their competitors, attracting and keeping customers, gaining efficiencies in systems and procedures (Reynolds 2004). Organisational change and firm strategies in the retail sector respond to changes in consumer demand. New retail formats and business models are in a way organisational innovations trying to fill the gap others do not serve. There are, of course, a lot of second mover who change their retail format once they realize that their competitors are more successful.

**Retail formats and marketing strategies.** Convenience stores (e.g. as they are integrated in gas stations, train stations and airport shopping centres) belong to such innovative retail formats that are prospering. So are discounters, neighbourhood stores and big specialty stores. They are crowding out supermarkets and department stores. This shift is a reaction to consumer's preference for clear and focused assortments at reasonable prices and at the same time toward availability and customization. In the past, supermarkets and department stores overwhelmed and irritated their customers with the unstructured variety of goods. Convenience stores are up front in the UK and in France. They are catching up in Germany as well. Neighbourhood stores in bigger European cities offer fresh food, over the counter meals almost around the clock next to fresh produce, snack and TV dinners. These concepts are being practiced at chains like Tesco, Sainsbury’s, Marks & Spencer and Delhaize. They have several retail concepts combined in a comparatively small retail space.

### 3.4 New requirements for sectoral innovation

The innovation themes discussed in the previous section give rise to new requirements related to sources of knowledge, organisational innovations, regulatory issues and institutional changes. The theme of sustainability (“greening”) is strongly related to eco-innovation (see chapter 5) and taking up this theme requires cross-sector agreements and regulations even across national boundaries. Innovations at business process level e.g. product assortment planning, multi-channel management and logistics require collaboration strategies among companies across the value chain as well as readiness for organisational and business process innovations. Customer-oriented innovations such as customer experience and event shopping, efficient consumer response require adequate business models and insight in customer behaviour as well as adequate business strategies, often requiring collaboration across multiple companies. Finally, exploiting ICT-based innovations requires knowledge and skills as well as readiness for process changes and organisational innovations.

Organisational innovations thus are part of the set of innovation themes and also – combined with process changes - readiness for organisational innovations and organisational capabilities are
constituting a key requirement for successful adoption of innovations. Such organisational innovations – for example in connection to ICT-innovations - include the change of work practices and working in changing organisational cultures reflecting the new role of customer demands, ICT solutions, multiple channels and flexible ways of working.

A key requirement for innovation in retail and wholesale relates to human resource: knowledge, collaboration, skills and qualifications. Given the rapidly changing nature of the retail business including increasing levels of competition and internationalisation and continuing rapid uptake of ICT it will be important to continuously adapt the knowledge and skills of employees. In this respect, Van der Giessen et al. (2009) recommend, specifically for the retail and wholesale trade sector, to adapt and modernise vocational education and training (nationally rather than EU level); to intensify cooperation across all stakeholders in education and training; to prepare for re-training, sup-skilling and multi-skilling; enhance flexibility and modularisation of education and training systems; develop e-learning and blended learning and a system of European-wide recognition of skills. Similar recommendations have been expressed in other studies (in the UK: Hristov and Reynolds 2007; in Ireland; Expert group on Future Skills Needs, 2010).

### 3.5 Sectoral innovation policy in a scenario framework

The Europe INNOVA scenario process highlighted possible future trends that have received relatively limited attention in policy initiatives on retail and wholesale, despite their potentially significant implications. Trends in government policy will have a profound impact on the European wholesale and retail sector and its ability to contribute to sustainable development. The scenarios are possible options how the sector may evolve which can be influenced and shaped by policy.

**Policies to address the “Big Boxes Everywhere Scenario”**. The “Big Boxes everywhere”-Scenario represents what is likely to happen if current trends of retail concentration are going to increase. This scenario was assessed by the workshop participants as likely to a certain degree but less desirable by reasons such as a lack of economic competition and growing difficulties for small and innovative retail formats to grow. Because of the high importance and the expected growing market share of this part of the retail sector, policy would help to reduce negative impacts on environment by supporting the greening of the sector. Through their buying power and influence, greening big businesses can effect more wide-ranging shifts in areas such as green products, sustainable transportation and energy efficient buildings than can be achieved by small-scale retailers. These possibilities of greening include:

- The development of standards for green retail (in regard to products, processes, buildings, transportation etc.) in cooperation of different actors from the retail sector, policy makers, consumers, and academia.
- It is reasonable to suppose that “green buildings” will arrive in the retail segment in the next few years. There should be incentives to retail chains and to retail real estate developers to develop a larger “green profile” and to develop specific concepts for greening retail sites.
- Regulation to ensure that retailers have to provide sustainable transportation solutions and to reduce CO2-emissions.
• New approaches to subsidize green products (in regard to food for example to subsidize organic food instead of farmers).

At the corporate level of retail chains sustainability is often equated with eco-efficiency. However, such a reduction misses several important sustainability criteria, especially in regard to working conditions. Access to comparable information in regard to the working conditions of particular retailers would be a precondition for consumers to make informed choices about where to shop and it would give authorities from the local level to the European level the opportunity to monitor working conditions, labour productivity and productivity in the retail sector. Monitoring and regulation could enable local communities and territorial authorities to prevent the crowding out of traditional businesses and small stores and to promote a diverse retail landscape (including the availability of a wide range of convenience goods).

**Policies to address the “Local markets scenario”**. This scenario is based on retail services mainly connected with products that are possible to produce locally. This scenario could be beneficial for local communities if local supply chains are supported by local governments and by European regulation and incentives. This scenario is only likely to happen in the case of measures and strategies that are focussed on the reduction of environmental impact by supporting farmers and local communities. Supporting this scenario would include measures for innovation with regard to local markets and to support the use of advanced technologies.

• The development of standards and technologies for the local exchange of goods and services.
• Supporting Web-based networks of local market actors to stimulate the exchange of goods directly between different regions.
• Supporting entrepreneurship at the local level to allow more stakeholders to be consumers and producers at the same time (for example; sell their surplus food and energy)
• Supporting advanced online community matching services to link supply and demand across and between local and regional communities.

To prevent that his development is slowing down innovation and reduce productivity growth it would be necessary to support the knowledge creation and the implementation of appropriate technologies.

**Policies to address the “Digital consumer scenario”**. The “digital consumer scenario” represents a trend of increasing online shopping. The scenario is likely to happen apart from the market share this retail format is going to gain. Supporting this scenario places several requirements on different actors at European level to realize the internal market for e-commerce.

• Ensuring electronic commerce in the internal European market by optimizing the rules for efficient cross-border postal services, establishing systems of redress and support of innovative European electronic payment systems.
• Promoting European companies to become global (to encounter the “Amazonization” of e-commerce) and to use the cultural and linguistic diversity in Europe for innovative online retail formats.
• Development of online-platforms for the re-use of goods. The “digital consumer scenario” provides an opportunity to reduce the environmental impact of retail, as well as increasing choice, information and targeting.

• Policies that give consumers the ownership of their data could strengthen the role of consumers, prevent further concentration and support competition in e-commerce.

Promoting this scenario by supporting technologies that link virtual and ‘physical’ environments as well as consumption and production will have positive impact on the entire value creation chain.

**Policies to address the “Lifestyle stores and malls scenario”**. This scenario is oriented toward providing more customer choice by meeting changing lifestyle preferences. Policies to support these scenarios could lead to greater diversity of choices in one place and could help to prevent further market concentration. Supporting lifestyle oriented agglomeration of producers and customers could give new market perspectives for specialized producers and services providers. Measures of supporting the transition towards more sustainable retail services that are described with regard to the other scenarios are also needed for this scenario.

**Policies to address the “The supermarket as a public good scenario”**. This scenario describes a transformation where the transition towards social and environmental sustainability will have the top priority. It would have positive impacts on the environment and on working conditions. In this scenario distribution is organized by a type of supermarket that is owned by society not by any individual or by a company. For this scenario new regulations are needed to establish this special kind of institutions.

• Development and promotion of social, environmental and ethical standards for the sector (adapting the notion of “the Commons”)

• Establishing a framework for non-commercial retail services that allow these organizations to compete with other retail formats.

• Development of independent information services (for example, environmental impact comparison sites)

**Improving the transition toward a more efficient and sustainable retail sector**

Across the different retail formats the following five issues have been identified as having the potential to improve the transition to a more efficient and sustainable retail sector (influencing at the same time the wholesale sector in the same direction): The first issue concerns the access to compact information which requires the development of a scheme (standardized at the European level) to ensure transparency and comparison across retailers operating in Europe so that consumers can make better informed choices in regard to environmental and social criteria.

Secondly, we have to take environmental costs – in particular CO2 emissions – in the retail supply chain (logistics, energy efficiency of retail buildings, marketing and communications, etc.) more into consideration, making them comparable and incorporate them into the sector’s costs. Therefore inter-coordinated standards at the European level are required. Thirdly, monitoring and reducing energy consumption, waste production and commercial traffic flows at the European level are required of
sustainable growth. The fourth issue addresses the need for a common European life-cycle assessment methodology for the evaluation and visualization of the environmental impact of products and services sold. And finally, policy makers at European level need to give incentives for the transition to a more sustainable retail and wholesale sector.
4 Barriers to innovation

4.1 Introduction

This chapter identifies market and regulation/policy factors that hamper or drive innovative activities in the wholesale and retail trade sector. A number of key factors influencing innovation where identified during research conducted under the umbrella of the Sector Innovation Watch Project Phase one (SIW-I). These factors are (Reinstaller and Unterlass, 2008):

- Financial constraints i.e. availability of funds for innovation, and technical and financial risk;
- Availability of human resources and skills, including capability to secure innovation benefits through patenting and licensing, and capability to integrate and use technologies;
- Experience in knowledge creation and diffusion;
- Cooperation between firms, forming networks e.g. cooperation with suppliers and customers;
- Demand factors such as involvement of customers and end-users;
- Competition and market structure as an environment stimulating innovation;
- Innovation culture, e.g. employees’ interest to innovation and change, and integration of a diversity of professionals in teams;
- Regulation and taxation, e.g. IPR regulation, regulation of competition, health and safety.

Other factors influencing innovation not explored by SIW-I work include the role of costs and efficiency optimisation in firms, and the role of global openness to trade. Whereas these factors may involve drivers as well as barriers this chapter primarily concentrates on identifying the barriers. This chapter is based on the results of the analysis of two data sets, the CIS4 micro-data and a complementary survey (SIW-II) conducted for this study towards the identification of market and regulatory failures, using CIS4 micro data for 21 countries in the EU.

Factors ranking based on CIS4 data. Based on CIS4 data, a large number of factors have been identified affecting innovation in wholesale and retail. The top ten factors, which demonstrate a high level of statistical significance, are displayed in table 4.1. The five top factors include four drivers and one barrier (“No demand for innovation”). The top drivers are European funding for encouraging innovation and collaboration with external partners.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Factor</th>
<th>Coef</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EU funding</td>
<td>0.784</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Collaboration</td>
<td>0.479</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Improved quality prod/serv</td>
<td>0.273</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Info from conferences</td>
<td>0.255</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>No demand for innovations</td>
<td>0.231</td>
<td>0.002</td>
</tr>
<tr>
<td>6</td>
<td>Faster response to customer</td>
<td>0.193</td>
<td>0.003</td>
</tr>
<tr>
<td>7</td>
<td>Reduced labour cost</td>
<td>0.182</td>
<td>0.006</td>
</tr>
<tr>
<td>8</td>
<td>Info from competitors</td>
<td>0.168</td>
<td>0.006</td>
</tr>
<tr>
<td>9</td>
<td>Increased range products</td>
<td>0.154</td>
<td>0.007</td>
</tr>
<tr>
<td>10</td>
<td>Improved employee satisfaction</td>
<td>0.178</td>
<td>0.008</td>
</tr>
</tbody>
</table>
Ranking within the top ten factors are a faster response to customer demand, reduced labour costs, increased range of products, employee satisfaction, and curiously enough the availability of information about competitors seems to hamper innovation in the wholesale and retail trade sector.

According to CIS4 data analysis, similar to other sectors analysed in the SIW-II like construction and food and beverages sectors, regulation and standards in the wholesale and retail trade sector does not explain the firm’s level of engagement on innovation. It is worth to be noticed that according to CIS4 data, regulation is an important driver of innovation for the average firm only in two sectors included in the SIW-II (Aerospace and Electrical and Optical Equipment). The salience and importance of regulation for innovation in the sector is contrasted to the results of CIS4 data analysis in section 4.4 with insights from the SIW-II survey, which finds a significant positive correlation between specific types of regulation and different forms of innovation.

4.2 Market factors affecting innovation

Literature on the effects of markets on innovation has stressed that competition in general, market structure (industry consolidation, market concentration), customer preferences, ageing of population, new fashions in consumption and heterogeneity of customer base are important drivers for innovation in the wholesale and retail trade sector. Competition is basically caused by the globalisation of the sector which is strongly enabled by information and communication technologies (ICT). Increasing global competition pushes retailers to innovate in order to reduce costs, exploit synergies and develop new markets (New Global study, DG Enterprise 2008; Van der Giessen et al. 2009). Globalisation also leads to concentration, consolidation and differentiation of goods and services. Many of the multinational retail companies have central position in the supply chain what leads to the emergence of “innovation hubs”: large companies are able to innovate on the supply and demand side, and the product diversity is enabled (Hristov and Reynolds 2007). There is also a positive effect on retailers which may easier become a part of global supply networks and are better aware of new opportunities. Ageing and changing customer preferences are among the drivers of innovation as well since they open an opportunity to develop innovative services targeting special customer groups: people dedicate less time to work and increase time for leisure and wellness, and devote more time and income for shopping (Djellal and Gallouj 2006). Hristov and Reynolds (2007) also emphasize customer experience as a driver where retail has become an interface between business and customer where customer demands are being shaped in a so-called reverse innovation cycle: new ideas are often first tested on a small scale, and then roll-out follows. In manufacturing, R&D investment requires large scale roll-out which is more risky. Gallouj (1998, 2002) stresses the importance of mass customization which is individual customisation and personalisation of products and services on a mass scale. Retail innovation evolves from mass production to mass customisation. Regarding hampering market factors to innovation in the wholesale and retail trade, the literature does not report any strong evidence.

The survey results confirmed the literature findings of market innovation drivers in the wholesale and retail trade sector: the factor “New fashions in consumption” has the highest average score thus is perceived by the firms as the strongest market driver for innovation, followed by the heterogeneity of
customer base and customer preferences. In contrast to the literature the survey results also emphasize strong evidence of barriers for innovation in the sector: oil and energy prices, inputs and components prices, and global financial crisis are perceived to have a negative effect on innovation by almost all of the respondents in the survey for the wholesale and retail sector.

The survey results suggest a high positive correlation between market factors and different types of innovation. Some of the suggested drivers of innovation (market protectionism, ageing of population, new fashions in consumption, heterogeneity of customer base) were not found to be positively correlated with any type of innovation. Some of the factors, which are highly positively correlated to innovation activity, are not mentioned by the literature e.g. incumbents current market position, market expansion in new regions, and vice versa, several factors which are stated in the literature are not recognized in the correlation analysis as significant innovation factors (e.g. ageing of population, new fashions in consumption).

**Business environment**

Literature on the effects of business environment on innovation for the wholesale and retail trade sector suggests that availability of necessary human and intellectual resources acts as innovation driver. Van der Giessen et al (2009), and Hristov and Reynolds (2007) as well, stress the importance of enhanced skills and competencies levels which are required to meet present and future competition in the wholesale and retail trade sector. According to the literature, enhanced skills level is important to establish a more innovative culture. The ICT and e-Business Impact in the Retail Industry study (2008) emphasize the significance of ICT usage, knowledge and know-how, since ICT is changing the nature of the wholesale and retail trade (ICT for global supply chain management, RFID, internet-based business, co-design, customer communities and experience etc.).

Survey respondents perceive business opportunities and capital risk as having an overall positive effect on innovation in this sector. Moreover, the survey results found also the customers’ acceptance and willingness to pay, R&D costs, availability of necessary human and intellectual resources and growth opportunities arising from collaborative innovation projects to have a considerably positive effect on innovation. The survey confirms the literature findings that availability of necessary human and intellectual resources acts as an innovation driver.

The survey results confirm the positive correlation between business opportunities and product innovations / supporting activities, and between growth opportunities arising from collaborative innovation projects and industrial relations. Among different business conditions, the survey identifies the availability of funds for innovation in the firms, in-house know-how to integrate and use new technologies in the companies, and access to information on technological opportunities, relevant to the investigated companies, to have the most positive effect on innovation activity.

The survey analysis also shows that access to information on technological opportunities relevant to the investigated companies is highly correlated to almost all types of innovation. The analysis also confirms the results for in-house know-how to integrate and use new technologies in the companies: the factor is highly correlated to services, manufacturing methods, supporting activities and
management systems innovation. On the other hand, the survey did not find any correlation between the availability of funds for innovation in the firms and any of the innovation types. The survey analysis revealed highly positive correlations between availability of funds for innovation outside the firm and management systems, and number of innovations appearing in the market useful for companies’ performance and products, supporting activities, management system, industrial relations and design innovation.

**Collaboration and open innovation**

In the literature customer preferences are mentioned as a driver for innovation in the wholesale and retail trade sector: at the level of wholesale and retail itself, it is the continuing interaction between firms and customers, even to the level of mass customization and user feedback and even user-generated designs, which is on the forefront of continuous product and service innovation cycles. The survey results show that the firms in the wholesale and retail trade sector perceive the collaboration with customers and suppliers to be the easiest, while on the other hand, the collaboration with competitors is perceived to be the most difficult among all the studied actors. Compared to the whole population of sectors (averages for all nine sectors) the wholesale and retail trade firms report higher or equal mean values, i.e. easier collaboration and open innovation with all actors. The largest mean difference is reported for collaboration with Universities, while there is no difference in the mean value compared to all sectors for collaboration with customers.

However, the survey results suggests that innovation of the wholesale and retail trade firms is highly positively correlated to collaboration with competitors, public research organisations and universities, while the association with collaboration with suppliers and customers is only moderately statistically significant. Three types of collaborations – collaboration with competitors, with PROs and with universities – is highly positively correlated to innovations in manufacturing methods, while collaboration with PROs is positively correlated to innovations in sales or distribution methods as well. From the correlation analysis it is evident that collaboration that ensures complementarities of innovative capacity and know-how is also highly positively correlated to innovations in manufacturing methods.

**Innovation culture**

There was no specific literature found on the effects of innovation culture on innovation and organisational learning as a driver of innovation in the wholesale and retail trade sector. However, these effects have long been studied in the literature which does not apply to a specific sector (e.g. Bell and Pavitt 1995; Leonard-Barton 1995; Nonaka and Takeuchi 1995; Nooteboom 2000). Most of this literature suggests that innovation culture and organisational learning are key components for enabling innovation in the firms.

The survey shows that in general, the firms in the wholesale and retail sector perceive all the studied factors to be easy accessible. Anyhow, the survey results suggest that in the sector most of the people value the experience of acquiring new skills/abilities as a strongest driver for innovation. This factor is identified as a driver of innovation also by the SIW and CIS-4 correlation analysis. SIW correlation Europe INNOVA Sectoral Innovation Watch
analysis shows that this factor has positive high correlation with product and services innovation, logistics and distribution innovation, and innovation in supporting activities. On the other hand CIS-4 emphasizes the correlation between the experience of acquiring new skills/abilities and innovation in management systems and in layout changes of production organisation. The SIW correlation analysis further suggests that innovation is also highly positively associated to team diversity, problem solving teams and participation in improvement activities. The integration of diversity is positively associated to innovation in products, logistics, delivery or distribution, in supporting activities, in management systems and in designs. Similarly, assembling problem solving teams to ensure a creative atmosphere is positively associated to all the above mentioned innovation types as well as to services, industrial relations and sales/distribution methods (9 out of 11 types of innovation). Wide participation in continuous improvement activities is positively associated to innovation in designs and logistics, delivery or distribution, respectively. Finally, people that speak two or more languages are positively related to the innovation in designs.

### 4.3 Regulation and innovation

Literature on innovation in the wholesale and retail trade suggests that labour regulations, in relation to the “flexicurity” concept, balancing labour flexibility and social security (European Commission: Flexicurity concept & Green paper on Modernising Labour Law to meet the challenges of the 21st Century, 2006), have a positive effect on innovation activity, especially on organizational innovation, in this sector. Safety and health regulations on product usage or service delivery (such as UK national regulations Control of Substances Hazardous to Health (COSHH) Regulations 2002) are also among the positive factors influencing innovation in the sector: these regulations control the use and storage of any products that could be harmful to health if they are not properly controlled what is causing the increase in materials and process innovation. Besides that, the modern industrial standards, such as standards for using RFID and for creating efficient customer-driven supply chains (EPC (Electronic Product Code) for localisation of goods during the delivery process and EAN (Article Numbering) for identification of products), positively effect on innovation activity. Standardisation is the prerequisite for more efficient and effective supply chains, efficient inventory management, reduction of delivery errors, and pro-actively addressing customer preference, but there could be some privacy concerns regarding usage of these technologies. The literature also points out consumer protection regulations (such as Data Protection Directive 1995) as a strengthening factor of innovation activities: these regulations facilitate entry of foreign competitors, requiring incumbents to be more competitive thus increasing the value of innovation.

From all of the drivers cited in the literature, the survey confirms the labour regulations to be a driver of innovation activities in this sector, even though the average survey score is not as significant as literature findings. Likewise, the safety and health regulations are perceived by the wholesale and retail firms as having a positive effect on innovation in general – these two factors are even the strongest drivers for innovation among the regulation factors according to survey findings. The regulations regarding standardization and consumer protection are perceived as very strong drivers as well. In contrast to the literature, where dual (positive and negative) influence of transport regulation, workforce safety regulations and intellectual property rights regime is suggested, the respondents...
perceive them to be very strong drivers for innovation among the regulation factors. None of the studied factors was found to be a significant barrier to innovation.

The results of the survey suggest a high positive correlation between specific types of regulation and types of innovation. All of the regulation types are highly positively correlated to at least one of the innovation types. Among the different innovation types, layout of production organisation is highly positively correlated to the most regulation types (22 out of 27 regulation types). Among the regulation types interoperability – compatibility (between old and new standards) is connected to most of the innovation types (9 out of 11 innovation types), followed by competition regulations in Europe (8 out of 11). The highest correlation is between competition regulations in Europe and layout of production organisation. The factors, which are highly positively correlated to innovation activity, seem to be those which are mainly not mentioned by the literature. Interoperability-compatibility (between old and new standards), for example, are highly positively correlated with almost all innovation types. Highly positively correlated to innovation activities are environment regulations, transport regulations, competition regulation in Europe, and industrial standards as well.

4.4 Systemic failures

Literature survey of influencing factors and barriers to innovation in the retail and wholesale sector and the additional survey as discussed in previous sections provide insight in forces and factors acting in the innovation process. Table 4.2 summarizes macro and micro level factors, and factors related to markets, sector structure, regulation and societal trends.

<table>
<thead>
<tr>
<th>Factor origin</th>
<th>Macro (society) level</th>
<th>Micro (business players) level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markets</td>
<td>Globalisation and competition</td>
<td>Customer experience</td>
</tr>
<tr>
<td></td>
<td>Dominance of multi-national retail companies</td>
<td>Mass customisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Competition and innovation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Job qualification, skills</td>
</tr>
<tr>
<td>Sector structure</td>
<td>Reconfiguration of value chains</td>
<td>Business process changes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Competition and innovation</td>
</tr>
<tr>
<td>Societal trends</td>
<td>Ageing, wellness</td>
<td>Adaptiveness to changing customer preferences</td>
</tr>
<tr>
<td></td>
<td>Sustainable production</td>
<td>ICTs and innovation</td>
</tr>
<tr>
<td>Regulation</td>
<td>Regulation and deregulation in retail</td>
<td>Adaptiveness to regulation, liberalisation and standards</td>
</tr>
<tr>
<td></td>
<td>Regulation and deregulation in wholesale</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Health and safety regulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Customer protection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Labour regulation</td>
<td></td>
</tr>
</tbody>
</table>

Many of the factors and forces discussed cannot directly be considered as driver or barrier to innovation. A key systemic factor is the capability of companies to benefit from such factors. Many influencing factors mentioned constitute conditions for innovation as part of the “innovation system” and open up opportunities, or potentially hinder the exploitation of opportunities towards innovation. Capabilities of companies, such as skills, innovation culture, innovation strategy, and capability to adapt business processes, are decisive in actually exploiting these opportunities.

As barriers to innovation in wholesale and retail the following can be considered, although a balanced view towards these barriers is necessary because of the role of capabilities as mentioned before:
- Lacking skills (e.g. regarding ICTs and organisational aspects of innovation), innovation culture, lacking strategies for innovation
- Lacking networks of companies, suppliers and customers where innovation is promoted. Such networks constitute an important part of the innovation system.
- Regulations regarding standards in relation to ICTs such as RFID, due to privacy concerns.

A few other factors also can be considered in relation to systemic failures. Hristov and Reynolds (2007) found that many of the multi-national retail companies established central positions in the supply chain. This contributes to the emergence of “innovation hubs”: large companies are able to innovate on the supply as well as demand side. This in itself enables product diversity, but customer choice may become more limited. Of interest is the area of standardisation, e.g. standards for RFID and for creating efficient customer-driven supply chains (e.g. based on Electronic Product Code for localisation of goods, or Article Numbering or product identification). Standardisation is the prerequisite for more efficient and effective supply chains, efficient inventory management, reduction of delivery errors, and pro-actively addressing customer preference. Privacy concerns may hinder innovation in this respect, as well as the difficulties to organise for collaboration across the supply chain.

As a conclusion, literature provides some observations of capabilities failure especially concerning the role of small firms that may lack the capabilities to learn rapidly and effectively and hence may be locked into existing technologies. Also there might be a case for weak network failure given the difficulty for SMEs to participate in networks for learning and innovation.
5 Horizontal issues relevant to the sector

This section discusses several horizontal issues in their relevance for the wholesale and retail sector. In particular the issues of organisational innovation and eco-innovation must be considered as highly relevant for the sector. Whereas organisational issues have been covered already in earlier chapters, we focus on eco-innovation mainly. Other horizontal topics such as national specialisation patterns, high-growth companies and lead markets were covered only marginally in the INNOVA SIW horizontal reports and seem of much less relevance for the sector.

5.1 National specialisation and innovation performance

The INNOVA SIW horizontal report on National specialisation and innovation performance, mostly based on patent data, considers the wholesale sector as a non-innovation intensive service sector in comparison to other sectors. Innovations are performed to reduce cost rather than to renew products. In most countries the share of turnover based on new products is less than 2 %, with two exceptions: Greece (above 8%) and Estonia (above 4%). The report concludes that over-all innovations are probably not a very important strategic variable for gaining a competitive edge in the sector. The report does not address the retail sector.

5.2 High-growth companies

High-growth companies, so-called gazelles, are important for competitiveness and development and as such fostering growth companies is an important policy issue. Based on CiS4 data, wholesale trade is among the sectors with the highest share of gazelles. Retail trade is among the sectors with an above average number of gazelles in South-Eastern Europe (Romania, Bulgaria).

5.3 Lead markets

Over-all, the lead market concept does not seem of particular high potential interest for wholesale and retail sector in order to accelerate innovation in products and services. The Horizontal report on “Lead markets” considers trade services having the lowest propensity to become a lead market as they are hampered by a lack of innovativeness and lack of industrialisation opportunities (measured by software intensity). Tradability is low, too, while service specificity is higher than in other sectors.

5.4 Organizational innovation

Within the wholesale and retail sector considered as service sectors, organisational innovation is of specific importance. Key ICT-enabled innovations such as electronic commerce and supply chain management are strongly intertwined with organisational and process innovations leading to innovations in the service, in business practice, in the workplace and in external business and customer relations. The INNOVA SIW horizontal report on Organisational Innovation concludes that, in general, ICT business tools have a significant and positive influence on increasing business organisational innovation developments, in particular IT systems to support orders and purchases, Enterprise Resource Planning and Customer Relations Management. The use of ICT for ordering
online and via the Internet certainly correlates to the share of service firms that undertake organisational innovations within the wholesale and retail sectors. Further, an increasing access to broadband and use of Local Area Networks (LANs) (and Intranet or Extranet) encourages and boosts firms’ organisational improvements in this sector. Factors enabling the effective use of IT systems for organisational innovation include the knowledge and skills level and the ability to synchronise both technical and organisational innovations.

5.5 Eco-innovation

As discussed in earlier chapters, eco-innovation must be considered as a highly important issue for the retail and wholesale sector. Besides “green” products, this also relates to resource-efficient processes and supply chains. An emerging innovation theme which is relevant across manufacturing and service sectors related to retail, and addresses eco-innovation from product design to service delivery and disposal or recovery is product life-cycle management (PLM).

Sustainability issues in the wholesale and retail sector are mainly attributed to store and warehouse operations and the transportation of products. Energy consumption (heating, cooling and electricity use), the use of refrigerants and water and the generation of waste are the main aspects in this sector which provide room for environmental improvements (EC 2009g). The European Commission has estimated that energy consumption in the services sector is about 15% of EU25 energy use (EC 2009g). Another important environmental issue is the generation of waste. Evidence from the UK suggests that wholesale and retailers generate 1.6 million tons of food waste (WRAP 2009b).

In terms of contribution to climate change, evidence from the UK suggests that wholesale and retail trade are one of the two largest 15 emitting sectors. This sector contributed (during the period 1992 - 2004) with about 40 Mt CO$_2$e greenhouse gas along the global supply chain (WRAP 2009). Suh (2006) found that 85% of emissions associated with services are induced from the supply chain (service / product delivery). The EIPRO study estimates that transportation of goods contributes with about 3 percent to the global warming potential (Tukker, Huppes et al. 2006). It should be taken into account that not all of transportation is related to products sold through the wholesale and retail sector. Taking the example of France, it is estimated that 52% of greenhouse gas emissions of households is attributed to products, corresponding to 16.4 tonnes of CO$_2$ equivalents/year per household (EC 2009g).

The use of resources in the wholesale and retail trade sector mainly occurs at store and warehouse operations and of products transportation which is linked to non-renewable energy consumption and the use of refrigerants. It is estimated that energy consumption in the services sector is about 15% of EU25 energy use. The direct sources for energy consumption within the wholesale- and retail industry are mostly attributed to store and warehouse operation. These include energy use for lighting, heating and cooling (EC 2009g). Water is also an important resource used by this sector (EC 2009g). Evidence from the US suggests that households consume 86% primary sector outputs and 44% secondary sector outputs indirectly, mainly through services. In addition, office-related materials are also a common set of goods used in this sector.
Eco-innovation opportunities for the wholesale and retail sector are mainly non-technological in character. These mainly exist in making environmental friendly products available and promoting them. Wholesale and retail organisations can stimulate their suppliers to make their products more eco-friendly. In addition an eco-innovation opportunity exist for large retail organisations to make the packaging of their own brands more eco-friendly. Eco-innovation opportunities also exist in improving the business processes of wholesale and retail organisations. Additional options are found in waste management and logistics optimisation. In addition wholesale and retail organisations can improve the energy efficiency of stores and warehouses to reduce their environmental impact.

Although the environmental impact of the manufacturing and products are not of their primary concern, wholesalers and retailers do have a direct influence on products they offer to their customers. Furthermore, wholesalers and retailers play an important role in the information provided to the customer. Innovations to improve the environmental impact of the production process of a particular product or to reduce its environmental impact during its life time could be attributed to the manufacturing industry, and is therefore out of scope. Similarly wholesalers and retailers make intensive use of the transport industry. Innovations to improve logistics within the operation of the wholesale and retail industry are considered. Conversely, innovations which improve the energy efficiency of transport (e.g., a more fuel efficient engine) could be attributed to the automobile industry and is out of scope for this research.

Innovation in the wholesale and retail sector is correlated with both environmentally and non-environmentally driven regulations. Regulations of environmental origin can be considered as very likely driving innovation in the wholesale and retail sector, as we found a high level of correlation between environmental regulations and innovation activities as a whole in the sector. Environmentally driven regulations in particular demonstrate a relatively strong association with innovation in management systems, in layout of production organisation and in industrial relationships, and a relatively weak association with innovation in supporting systems, services and products. Waste regulations have been applied to the sector in the past, and currently waste management is a normal practice in this sector. Waste regulation was found strongly associated with production organisation in particular. It is worth noticing that innovation in logistics and distribution was found not to be associated with environmentally driven regulation nor with transport regulations, this despite the important role that transport plays in this sector.

We notice that a large block of non-environmentally motivated regulations demonstrates a high level of association with various types of innovation activities at the firm level in the wholesale and retail sector. Examples include European competition regulation, interoperability regulation, workforce safety regulation and industrial standards regulation.

As a final remark, retail and trade activities are integral part of the value chain of many sectors. Therefore eco-innovation opportunities as well as regulations and their impact on innovation affect other sectors as well.
6 Policy analysis and conclusions

6.1 Main findings summarized

The retail and wholesale trade sector traditionally is considered as a poor innovator. This report has adopted a more comprehensive view on innovation, taking into account both ICT-driven technological innovation and non-technological innovation, and also taking into account market and regulatory barriers to innovation as well as “horizontal” issues such as organisational innovation and eco-innovation. The retail and wholesale trade sector not just acts as a delivery channel of products to the customer, but forms a critical part of the producer value chain in other sectors such as food and manufacturing. The sector embodies the client interface where customer preferences are shaped and expressed.

Innovations mostly have the character of process and service innovations, for example new ways of selling, marketing, logistics and firm operations. The on-going transformation of the sector is demonstrated by blurring distinctions between wholesale and retail, by diversity across horizontal branches, and by a diversity of organizational and strategic concepts. In this transformation, ICT (in particular e-commerce) as well as new organizational concepts fulfil an enabling role through facilitating the formation of client perceptions, desires and needs.

Although the retail and wholesale trade sector represents an economically important activity the share of innovative firms in this sector is clearly less important than in the overall economy. The expenditure on innovation is relatively low and efforts on research, development and innovation are also relatively small compared with other sectors. Innovation is more frequent in the wholesale trade sub-sector whereas the retail trade sub-sector shows a more modest level of innovation activities. The most common innovations in these sub-sectors are linked to introducing new or significantly enhanced support activities. The introduction of new or significantly improved methods of production as well as new systems for logistics and distribution is relatively widespread. These innovations are expected to considerably contribute to efficiency gains for producers and final customers, also in other sectors. Innovation is part of the daily work and business environment rather than a dedicated activity.

Given that the specific nature of innovation in retail and wholesale trade is mostly related to process and service oriented innovations, such innovations are less subject to patents or other types of registration. Still, the percentage of firms applying for any form of intellectual property rights (IPR) is surprisingly high: 30 % of wholesalers, 20 % of retailers, and mostly related to trademark registration. Firms located in Northern Europe are taking the lead. Our findings confirm the lack of formalisation of innovation inputs, processes and outputs in the retail and wholesale trade sector and the relatively higher importance of non-formal innovation processes.

It can be said that in wholesale and retail trade, humans are the main carriers of innovation. Skills include technical skills but also skills to foster a culture of innovation and skills related to the management of innovation. It can be expected that technological and business changes in retail and wholesale trade are on-going. This requests for more attention to occupational qualities and skills differentiation. As SMEs are dominating the wholesale and retail trade sector and have limited
possibilities to address the emerging skills, more emphasis is needed on vocational training. Governments and business associations could play an important role in increasing awareness and upgrading the innovation conditions in the sector.

An important carrier of innovation lies also in cooperation and networking. Around 20% of innovative firms in retail and wholesale have arrangements for collaboration in innovative activities, more common in wholesale and less frequent among Southern European countries. Firms in both retail and wholesale mostly cooperate with domestic partners, and especially firms active in their markets. Foreign cooperation is relatively rare, with wholesalers exhibiting a higher level. The low percentage of firms cooperating with universities and public research institutes suggests that innovations developed through such forms of cooperation are seen as less useful, or that the potential of such forms of cooperation is not yet recognised and exploited.

Carriers of innovation such as education and training for the purpose of upgrading skills, and cooperation and networking within and across the value chain, play an important role in enhancing the over-all innovation system in retail and wholesale trade. Other elements are a strong role of government support, e.g. to stimulate cooperation in innovation as it comes to ICT-related innovation programs in logistics, distribution and Internet-based supply chains. Also, governments could increasingly act as leading innovation partners through their public procurement procedures.

Another important carrier of innovation is the organisational change of firms, using knowledge intensive services like logistics and strategic consultancy to create new comparative advantages. An example is how large multinational commercial chains adapt the vertical integration of the value added chain to multi-location production units, benefiting from global demand. Organisational changes are essential to incorporate both the use of knowledge intensive services and the effective integration of ICT as two complementary ingredients of service innovation.

Forces operating in the retail and wholesale trade value chain are driving change and innovation. Many trends are affecting all the value chain segments and affect the way of doing business and interacting with customers. Such trends include sustainability, convergence, new product trends, IT-integration in all processes (e.g. RFID, supply chain management, web stores, multichannel retailing), and re-regulation (opening hours, allowance for selling medicine etc.). In retail and wholesale trade it is the continuing interaction between firms and customers at the level of mass customization, user feedback and user-generated designs which is on the forefront of continuous product and service innovation cycles.

Clearly this poses some challenges to innovation and the innovation process itself. In the first place, new innovation themes emerge, related to innovative service concepts, value chain innovation, adoption of Internet channels, supply chain management, personalised customer interfaces, RFID (“Internet of Things”) and to customer experience. It also raises the issue whether the ‘innovation ecosystem” can be further improved. This report has not looked in detail into the constituting elements of retail and wholesale innovation systems, which also strongly relate to national circumstances and to innovation in related sectors such as logistics. However, there are some common issues relevant to
improving the innovation system. Analysis of the innovation climate demonstrates some relative disadvantages regarding the retail and wholesale trade sector. The potential of absorbing innovations from elsewhere is relatively low. The low level of appropriability (e.g. the difficulty of patenting) hampers innovation activities. The climate of cooperation in innovation may be further enhanced. The dominance of large players in innovation still hampers SME-level innovation.

We have developed five future scenarios to elaborate future innovation challenges. In the first scenario “Big Boxes Everywhere & Green Big Boxes Everywhere”, discounters, supermarkets, hypermarkets, and the retail chains are omnipresent. In the second scenario “Local Markets – connected through the web”, local markets are strongly based on products that could produced locally. In the third scenario “The Digital Consumer” the common internal market for e-commerce is fully realized and shopping takes place through e-commerce. Providing more customer choice to meet changing lifestyle preferences is the defining driver in the fourth “The Rise of Lifestyle Stores and Malls” scenario. The fifth scenario “The supermarket as a public good” may arise if values in regard to shopping are radically changing the retail and wholesale landscape. Emerging from the scenarios and supported by our previous observations, key innovation themes are strongly related to internationalization, changes in consumer demand and to ICT solutions related to these demands. Innovation themes do not lay mostly on the technology side but are strongly related to organisational and service innovation as well. Innovation themes do not only touch the organization of retail but also the structure of the companies and of the sector. There are also some linkages to developments in the food and beverage sector, the textiles and clothing sector, the construction sector, and the optoelectronics sector. Some of the main innovation themes identified in this study are the following:

- **Sustainability or “greening”**. This is a driver for various innovative developments such as new retail formats, green and eco-efficient supply chains and logistics, smart energy-efficient buildings, innovative packaging materials.

- **Personalisation**. Enabled by ICTs and changing lifestyles, personalisation leads to innovative and customised products and services as well as organisational changes in the value chain. Mass customisation combines individual customisation and mass production.

- **Planning, logistics and organisation**. This includes product assortment planning to anticipate customer needs as well as supply chain logistics and related organisational changes across the value chain. A key technology is ICT to support efficient and adaptive logistic and planning processes, as well as product life cycle management from design to maintenance and disposal.

- **Customer relations management**. This area includes new retail formats targeting customer experience and event shopping, as well as technologies for efficient customer response. Mass customisation changes the role of consumers to co-creators.

- **ICT solutions**. Underlying most of the innovations is ICT as an enabling technology, including ICT-based services as part of product service systems across the product life cycle, ICT enabling efficient logistics and supply chains, and ICTs enabling customer-producer interaction and co-creation.
Factors specifically influencing or hampering innovation have been identified; the majority of factors identified act as driver of innovation. As barriers were identified the “lack of demand for innovation” and, of less importance, “lack of information about competitors” and “cost of innovation”. Regulations as well as standardisation activities have a positive effect on innovation, especially on organisational innovation. Regarding market factors, literature does not report any strong evidence concerning hampering factors. Market factors such as competition and globalisation are found to affect innovation mostly as driver and not as barrier. Our survey identified strong evidence of barriers for innovation in particular regarding oil and energy prices, inputs and component prices and financial global crisis. Availability of human resources, skills and competencies acts as innovation driver and lacking skills and competencies, absence of an innovative culture and shortage of R&D funds act as generic barriers to innovation. However based on the survey no general conclusions can be drawn concerning the actual existence of barriers in this respect. As a conclusion a variety of business and sector factors are found to affect innovation. Many of these factors seem to act as “enabling conditions”. This also implies that the lack of such conditions e.g. resources, skills, innovation culture hampers innovation in concrete business situations. In terms of systemic failures in the retail and wholesale innovation systems, little concrete evidence is found for the existence of such failures. Literature provides some observations of capabilities failure especially concerning the role of small firms that may lack the capabilities to learn rapidly and effectively and hence may be locked into existing technologies. Also there might be a case for weak network failure given the difficulty for SMEs to participate in networks for learning and innovation.

Two main horizontal issues of relevance to innovation in the retail and wholesale sector are organisational innovation and eco-innovation. Key ICT-enabled innovations such as using article coding, electronic commerce and supply chain management are, in order to take full advantage, strongly intertwined with organisational and process innovations that result in innovations in the retail service, in actual business practice, in distribution networks and supply chain relations including customer relations. Eco-innovation can be considered as a key development for the retail and wholesale sector as it potentially not only relates to “green products’ but also to resource-efficient processes and supply chains. An emerging innovation theme which is relevant across manufacturing and service sectors related to retail and trade, and addresses eco-innovation from product design to service delivery and disposal or recovery is product life-cycle management. Eco-innovation opportunities for the sector are partly non-technical in character as they exist mainly in making available and promoting environmental-friendly products. Wholesale and retail organisations can stimulate their suppliers to make their products more eco-friendly and to work on energy efficiency. In addition eco-innovation opportunities exist for large retail organisations in the field of packaging and waste management. Besides, eco-innovation opportunities exist in improving business processes and logistics and supply chains of wholesale and retail organisations. The challenge here is to agree on technologies and eco-innovation approaches across the supply chain and value network.

6.2 Policy directions
A general key challenge for policies is to enhance the skills and capabilities of firms to exploit the opportunities of innovation, and to enhance their capability to participate in innovation networks. In this Europe INNOVA Sectoral Innovation Watch
respect, more attention should be paid to education, skills and innovation culture, and innovation communities. Valuable initiatives have been taken in several EU countries, which could be adopted in other countries and complemented at EU level.

The three most important issues for innovation policy include the role of organisational innovation, the trend towards eco-innovation, and fostering of open collaborative innovation environments. In relation to open innovation, it should be recognized that not always strong incentives exist for companies to engage in retail and wholesale innovation, especially where innovation must be collaborative and supply chain based. As wholesale and retail firms are part of wider supply chains and networks, a policy challenge is to stimulate the participation of the innovation-prone wholesale and retail firms in large-scale research and innovation programs as promoted by EU programs such as FP7 and CIP. Examples of innovation themes that are relevant for wholesale and retail companies are mass customisation, RFID (Internet of Things), product life-cycle management, and logistics and supply chain management. EU initiatives in this respect could be complemented by national initiatives.

Eco-innovation is recognized as a key development in the wholesale and retail sector and linking to other sectors. Successful eco-innovation needs stimulation of innovation capabilities across the wholesale and retail supply chain and related value network. In this respect, green procurement is supposed to stimulate the demand for green products and services. By creating more demand on the public sector, a home market for such products can be created within the EU. Such procurement policies should be established at the EU level, complementing national policies. A European “home market” is very important for “greening” approaches to make the sector more sustainable.

Smart consumption and sustainable products are already supported by some EU directives, e.g. the so called Eco-Design Directive, as well as by labelling schemes. Smarter consumption has to start at the production process. Support for this could be provided by the concept “design for recycling” and C2C (consumer to consumer) as it has already been introduced in the auto industry. Policy makers could support this process by bringing together manufacturers of products with the recycling and waste management industries and with consumers in forums and platforms (Bilsen et al 2009: 164pp.).

Other policies may affect innovation in wholesale and retail as well. Security and privacy issues play a role when it comes to surveillance of customers and employees in the store and using RFID technologies for tracking. Though several laws exist at national level, they are often outdated and cannot keep up with modern technologies and the privacy infringements they might cause. More precarious in terms of privacy infringement, however, are e-commerce providers as there is a serious legislative gap in relation to how the privacy of the customer can be ensured, especially when they make their personal data public voluntarily.

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9 This includes the Energy Labelling Directive, the Energy Star Regulation, and the Ecolabel Regulation.
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The Networking Skill Shortage – How women can narrow the gap


Annex – Overview of SIW deliverables

Overview of the deliverables from the Europe INNOVA Sectoral Innovation Watch

Deliverables can be downloaded from www.europe-innova.eu

**Task 1 Innovation Performance Sectoral Reports**


**Task 2 Foresight Reports**


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December 2011


Task 3 Market and Regulatory Factors


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**Task 4 Horizontal Reports**


**Task 5 Input and Output Papers**


Mitusch, K. and A. Schimke (2011) Gazelles – High-Growth Companies, Input Paper to the workshop ‘Gazelles as drivers for job creation and innovation: How to support them best?’, Task 5, Europe INNOVA Sectoral Innovation Watch
INNOVA Sectoral Innovation Watch, for DG Enterprise and Industry, European Commission January 2011


**Final Sectoral Reports**


**Final Synthesis Report**