
ANALYSIS OF INNOVATION DRIVERS AND BARRIERS IN SUPPORT OF BETTER POLICIES

Economic and Market Intelligence on Innovation

Organisational and Marketing Innovation – Promises and Pitfalls

Final Report

Prepared for:

European Commission

Directorate-General Enterprise and Industry

Unit B/3: Innovation Policy for Growth

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Karlsruhe, December 2012

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Acknowledgements

We are particularly grateful to the referees of this report who made important suggestions for improvement that have led to a substantial progress of this report. We also thank our policy officer Mr Frank Knecht from the European Commission for his guidance and support. Moreover, the team would also like to thank the group of experts who participated in the Validation Workshop held on September 25th 2012 in Brussels for their valuable input.

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Suggested citation

Som, O., Diekmann, J., Solberg, E., Schricke, E., Schubert, T., Jung-Erceg, P., Stehnken, T., Daimer, S. (2012): Organisational and Marketing Innovation - Promises and Pitfalls? PRO INNO Europe: INNO-Grips II report, Brussels: European Commission, DG Enterprise and Industry.

Foreword

"INNO-Grips" (short for "Global Review of Innovation Policy Studies") is supporting policy-makers in adopting appropriate policy responses to emerging innovation needs, trends and phenomena. It analyses framework conditions, barriers and drivers to innovation and innovation policy and offers intelligence on international developments in these fields.

Over a period of three years (2010-2012) INNO-Grips conducts studies and organises workshops to exchange views, ideas and best practices with innovation stakeholders in order to optimise innovation policy Europe-wide. These key activities are complemented by a news service about international innovation policy developments, covering about 40 countries worldwide, and further dissemination activities such as newsletters. Target audiences are invited to discuss the results of studies and related issues in an interactive online environment (the INNO-Grips blog). INNO-Grips is thus a platform for all stakeholders involved in the practice of innovation and in innovation policy, in particular innovation policy makers at the EU, national and regional levels; innovation intermediaries such as innovation agencies and knowledge transfer centres; innovation practitioners and academia conducting research on innovation dynamics.

Technically, INNO-Grips consists of two lots. The first one – "Innovation policy research and intelligence" – gathers evidence on innovation policy developments worldwide and analyses specific aspects and trends in detail. The second lot – "Economic and market intelligence on innovation" – analyses framework conditions (e.g. implications of socio-economic trends), barriers and drivers to innovation at firm level. This report is the fifth in a series of six studies in the context of the second lot which investigates the following topics:

1. Barriers to internationalisation and growth of the EU's innovative companies
2. Socio-economic trends for innovation policy
3. Open innovation and other new forms of collaboration
4. Social attitudes to innovation and entrepreneurship
5. Organisational and Marketing Innovation – Promises and Pitfalls?

The role of multinational companies and supply chains in innovation

These studies are delivered in close coordination with the representatives of the European Commission and in close interaction with the service providers of the other PRO INNO Europe activities. All studies are of high relevance to the European Commission strategy growth Europe 2020.

WIFO is the lead partner of the "Economic and market intelligence on innovation" studies and is also responsible for the coordination of activities with the European Commission. The partner institutions in this project are NIFU-Step based in Oslo, UNU-Merit based in Maastricht, the Fraunhofer Institute for Systems and Innovation Research (ISI) based in Karlsruhe, and the Management Center Innsbruck. Greenovate! Europe supports all dissemination activities. Each study is presented and discussed at workshops organised by the Consortium in close cooperation with the European Commission. The workshops serve to present the findings and conclusions as

well as the derived policy recommendations to a qualified audience of stakeholders, representatives of the business community, policy makers, and leading academics for external validation.

The present report focuses on the promises and pitfalls associated with organisational and marketing innovations. The terms of reference established that this study should cover the following topics:

- To what degree are organisational and marketing innovations deployed among European enterprises (manufacturing and services) today, and by which structural characteristics of firms is their usage being shaped?
- Which direct and indirect effects of organisational and marketing innovation on the firms' competitive advantage and economic performance can be observed?
- To what extent are organisational and marketing innovations affected by external barriers associated with market or system failures that hamper firms' innovation activities? What does this imply regarding the need for and design of policy support?
- Are there existing policies and policy instruments already in use in EU Member States and beyond to support organisational and marketing innovation? On which aspects of innovation barriers do they focus?

Executive summary

Background

In the past decades, theoretical and particularly empirical innovation research has focused mainly on technological or R&D-based innovation as the determining source, the “engine” of a developed economy’s growth. In this traditional framework, innovation activities of firms are perceived to comprise product and technical process innovation. New products typically contain new technical features that offer new functionalities or allow for new areas of application. New technical processes basically rely on the use of new technologies to enhance efficiency, speed, flexibility or quality of production. But this mere technological view on innovation has been criticised for different reasons.

Researchers of the evolutionary tradition in economics have criticised this R&D paradigm. They suggest that innovation ability is more likely to be based on firm-specific routines and firm-individual heuristics instead of merely single, homogeneous R&D-based innovation strategies. One of the key arguments of evolutionary economics points to the fact that enterprises show considerable heterogeneity in their innovation behaviour and strategies, even within similar framework conditions of sectors or innovation systems. Following the large strand of theory labelled the “resource-based view of the firm”, which originates in an evolutionary perspective, this heterogeneity is related to the different routines, capabilities, skills and experiences of firms. The innovativeness and economic success of firms are thus not necessarily simply about high technology or excessive R&D expenditures. R&D-focused approaches often overlook that a major part of firms’ innovation does not necessarily originate from institutionalised, internal R&D activity.

This widening of the innovation concept is also reflected in a paradigmatic shift in the understanding of innovation generating processes within organisations in general and enterprises in particular. The understanding of innovation processes has shifted from the linear, sequential and thus predictable nature towards complex and self-referential cycle models which account for multiple recursive feedback loops and other sources of innovation knowledge. Innovations do not necessarily have to be radical; on the contrary, they involve incremental social and organisational changes, as well as technological advance. Consequently, innovations are not just the results of scientific work in a laboratory-like environment. They are realised in networks where actors from different backgrounds are involved in the process, setting new demands for innovativeness. As a result, the innovation process is understood as complex and variable.

The latest edition of the Oslo Manual of the European Commission and the OECD, which presents the methodological basis for major innovation studies such as the European Community Survey, has taken up Schumpeter’s broad understanding of innovation and proposes an enlarged understanding of innovation. Besides new products, also new services, production methods, markets or new sources of supply and new types of organisation structures can be regarded as innovations if they help to increase competitiveness and economic success. According to this broad approach, innovations include non-technological aspects like marketing and organisational

innovations as well as technological dimensions such as new products or manufacturing processes.

These developments are also reflected in the targets of the European Commission's flagship initiative "Innovation Union" which represents a considerable change in European innovation policy. Instead of a narrow, science-push (technological) understanding of innovation, it explicitly focuses on the broader systemic nature of innovation including technological as well as non-technological dimensions of innovation and their interplay. Its emphasis on the role of service innovation, design, organisational change, marketing innovation, business model innovation, and social innovation connects to the innovation definition of the OSLO Manual. An explicit display of the increased importance of non-technological based forms of marketing innovation is, for instance, reflected in the promotion of design. Within the flagship initiative "Innovation Union" the European Commission has committed itself to a European Design Innovation Initiative.

Since non-technological types of innovation, including organisational and marketing innovation are considered to significantly contribute to firms' competitive advantage, policy-makers are confronted with the question whether and how these forms of innovation could be supported by corresponding policy instruments. For instance, some authors argue that non-technological forms of innovation are characterised by lower levels of investment costs and risk, and are therefore not in need of specific innovation and technology policy support. Moreover, in contrast to technological innovation, the contribution of non-technological innovations cannot always easily be accounted in concrete numbers. For this reason, their economic relevance and thus legitimacy for policy support remains often rather vague. To date, it has not been addressed by previous studies concerning whether and by which market or system failures organisational and marketing innovation are particularly affected and how policy support can be justified against this background.

Research questions

Being a part of the INNO-Grips research project, this work package will thus for the first time explicitly deal with the question whether and to what degree organisational and marketing innovation are affected by specific barriers and obstacles which would require innovation policy support. Moreover, innovation must demonstrate its economic impact to justify further funding. Therefore, to analyse whether and how organisational and marketing innovation could be subject to policy support, the study will differentiate between two essential preconditions: a) the necessary condition that both types of innovation cause positive effects on the economic performance of firms, and b) the sufficient condition that they are affected by market failure in the neoclassical, or system failures in the evolutionary understanding. In detail, this work package study will address the following research questions:

- To what degree are organisational and marketing innovations deployed among European enterprises (manufacturing and services) today, and by which structural characteristics of firms is their usage being shaped?

- Which direct and indirect impacts and effects of organisational and marketing innovation on the firms' competitive advantage and economic performance can be observed?
- To what extent are organisational and marketing innovations affected by external barriers and constraints related to market or system failures that hamper firms' innovation activities? What does this imply regarding the need for and design of policy support?
- Are there existing policies and policy instruments already in use in EU Member States and beyond to support organisational and marketing innovation? On which aspects of innovation barriers do they focus?

Key findings

- Organisational and marketing innovations are deployed by a considerable share of European enterprises in order to gain economic success and competitive advantage. But due to the highly complex nature and strong reference to related fields of product innovation (in the case of marketing) and technical process innovation (in the case of organisational innovation), their economic effects are more likely to become visible as indirect effects in terms of “enablers” and “prerequisites” for innovation. Nevertheless, the findings presented in this report show that organisational and marketing innovation can also contribute to firms' direct economic performance in terms of sales growth and increases in productivity. Based on the analysis of selected organisational concepts, the findings also depict that different organisational measures vary in their linkage to different economic performance dimensions.
- Highly successful enterprises in particular succeed in integrating multiple types of different ingredients of innovation along their competitive strategy. The conceptual differentiation between different fields or types of innovation (i.e. product, service, organizational, marketing innovation, technological or non-technological innovation) often blurs the vision to recognise this aspect. The identification of abstract “complementarities” between different types of innovation might, however, be just a first (but nevertheless important) step towards a detailed policy analysis as they only say little about their causal relationship, which in turn might be highly dependable on market and firm characteristics. Hence, there is further need for research on the causal relationships between different fields of innovation in general and technological and non-technological innovations in particular.
- The academic concepts of marketing and organisational innovation are subject to two-fold translation problems: these terms are scarcely used by enterprises or by policy-makers included in the expert interviews. Instead policy-makers as well as enterprises in particular are more in favour of a problem-oriented approach to innovation. Future research should take this into account by “collecting” them from their individual perceptions, for instance, by developing new measurement approaches.

- The methodological approach consisting of qualitative and quantitative instruments used by this report has turned out to be a feasible approach for addressing the problem-oriented perception of firms and policy-makers. Quantitative analysis succeeded in the general identification of positive interlinkages of organisational and marketing innovation to firms' economic success, the identification of complementary relationships between technological and non-technological fields of innovation as well as of a set of structural characteristics by which the usage of organisational and marketing innovation is being shaped. In addition, the qualitative case studies addressed the problem-oriented perspective of firms and policy makers and helped to understand the generation and implementation of these innovations within the practical business of firms. By allowing for a larger number of variables that could be taken into consideration they revealed a set of external barriers affecting the successful development and implementation of organisational and marketing innovation.
- The case examples of firms revealed external barriers affecting organisational and marketing innovation activities of firms. Because of the single case design, they can, however, not be generally applied to the whole universe of European firms. For this reason, they are also not sufficient to derive the need for and design of policy instruments specifically aiming to support these two kinds of innovation. Therefore, the research focused on needs to be delimited in such a way that the variance in the relevant properties in the quantitative data can be covered by two or three firm cases in the qualitative case studies. Nevertheless, however, the findings presented in this report provide novel empirical support for the existence of barriers and obstacles related to organisational and marketing innovation and thus help to advance academic and policy debates in this field.

Economic effects of organisational and marketing innovation

Summarising the findings from the quantitative analysis of CIS 2008 data, there is evidence that those forms of non-technological innovation activities which impact on external relations and sales channels have a positive effect on sales growth. In addition, the interaction of innovation activities, i.e. organisational innovation as well as marketing innovation, appears to be most powerful for improving firm performance. Furthermore, non-technological innovation activities spur on goods and service innovation. Thus, those enterprises which perform a combination of innovation activities will benefit most from these endeavours in terms of innovative and economic performance.

In conclusion, the evidence acquired implies that combining non-technological and technological innovation activities appears to be the best strategy for fostering innovation and economic growth. As firms can improve their innovative capacity by non-technological innovation, it may be assumed that supporting these innovation activities is an important field for policy-making in order to impact on innovative and economic performance. Nonetheless, the results also showed that undertaking organisational and marketing innovation activities depends on firm size as well as on industry background. In particular, with regard to the relationship with industries more research is needed to understand better the circumstances and framework conditions for innovation activities. There

might be systemic obstacles impeding firms from undertaking non-technological innovation activities. Only if these barriers are fully understood can appropriate action be taken.

To briefly summarise the main findings of the additional analysis of the use and effects of selected organisational concepts based on EMS 2009 data, the results generally show positive effects of the selected organisational concepts on firms' productivity performance as well as positive complementarities with the fields of product and service innovation. But it has to be noted that not all organisational concepts considered show similar effects. While some have a positive impact on one performance dimension they might have no or even a negative impact on others. Moreover, for some organisational concepts their positive effects on firm performance only become visible if they are deployed to a certain intensity. As the performance variables related to product and service innovation show, to assess the economic impact of organisational concepts adequately, it is also necessary to choose the right performance dimension. By looking only at the share of turnover that is obtained by new products, the positive impact of organisational concepts runs the risk of being underestimated. As these findings underline, organisational innovation represents a highly complex issue which does not allow for one-size-fits-all approaches. With regard to innovation policy, this means that the design of policy instruments needs to be carefully adjusted to the performance dimension that should be addressed.

Barriers and obstacles for organisational and marketing innovation

First of all, the positive impact of organisational and marketing innovation has also been strongly confirmed on the basis of 14 case interviews at firms. Almost all firms' representatives interviewed considered marketing and organisational innovation to be of high strategic importance for the long-term survival of their company. However, the economic effects can frequently not be assessed in a direct way. Only four cases reported impacts in terms of a rise in turnover of a product that can be directly traced back to organisational and marketing innovation activities. Instead, the economic impact of organisational and marketing innovation mostly takes place in an indirect manner, for instance in terms of coping with rapid firm growth, improving internal work processes, deepening relationships to customers and users or increasing the accumulation and diffusion of innovation knowledge within the enterprise.

With regard to specific barriers and hampering factors, the firm interviews revealed that a lack of financial and personnel resources might act as an important obstacle to organisational and marketing innovation. External experts and existing blueprints for organisational or marketing concepts can reduce these costs only to a limited extent, since the existing solutions require a high amount of adaption to the specific frame conditions of the single firm. There was no case in which the firm was able to deploy a ready-to-use organisational or marketing concept. As most firm cases show, the available stock of their own knowledge about marketing and organisational innovation is considered as quite low. However, due to their superior stock of resources, larger firms are more likely to be aware of these innovation fields and have higher internal knowledge about organisational and marketing innovation. Moreover, as particular organisational or marketing innovations (e.g. networking initiatives, public branding strategies) require a certain critical mass, they entail higher success rates for larger firms. Additionally, in contrast to new technical solutions,

especially marketing innovations require firms' constant commitment in order to maintain their positive effects.

Due to the fact that the economic benefits of organisational and marketing innovation can hardly be assessed both in advance and ex post to corresponding innovation projects, all firms experienced a very high level of uncertainty which is at least as high as for R&D-based innovation projects. But unlike R&D-based projects, which often take place in some kind of "isolated", specialised R&D departments, a failure of organisational innovation in particular affects the "beating heart of the company" and might result in serious damage to the firms' basic business processes. Hence, the risk of organisational innovations might reach beyond the direct financial risk. Nevertheless, most of the firms interviewed felt unable to assess the risks and benefits of organisational and marketing innovation because of the lack of an established set of indicators and ratios. As a consequence, especially organisational innovation has appeared as a reactive strategy of firms for coping with current problems rather than a proactive innovation pattern which is part of the firms' strategic planning process. Specialized departments for marketing were the basis for giving the activities in that field a strategic perspective and a continuous development.

In consequence, most of the firms interviewed had no dedicated staff position for organisational or marketing innovation before the innovation project. But as the lack of such specialists is perceived to reduce the absorptive capacity for identifying new organisational or marketing solutions as well as decreasing the ability to find external partners for such projects, some firms started to employ dedicated personnel resources during the implementation processes. Here only one firm reported problems finding qualified employees for their newly created marketing department.

The difficulties in measuring the positive effects and costs of organisational and marketing innovations results in problems with attracting external financing and capital. The innovation projects were predominantly financed by internal funds in all cases considered. Only a few firms state that they made additional use of public policy programs in terms of finding opportunities to embed an organisational or marketing innovation in a technical or R&D-based innovation project. Especially the lack of material collateral (like machinery to be bought for a technical process innovation) is seen as an obstacle to attracting external funding. These findings remain stable for all countries and sectors that were considered when interviewing firms.

Finally, despite the limited possibility of transferring organisational or marketing solutions directly from one firm to another, knowledge and experiences from external partners were considered as very important by all firms for the success of organisational and marketing innovations. But different interactive patterns for organisational and marketing innovation appeared in the past. While in the case of organisational innovation the necessary information for organisational innovation came predominantly from close ties with partners along the value chain, loose ties to universities, marketing agencies or other firms were of high value for marketing innovation. But almost all firms stated that there is a lack of platforms, databases or arenas in which existing organisational or marketing solutions can diffuse across different sectors and niches. They are not aware of an institutionalised mechanism (like the patent system in the case of technical inventions) for stimulating the diffusion of such types of non-technological innovation and would highly appreciate initiatives for developing such platforms.

Policy analysis

Overall, the broad concept of innovation, including non-technological forms of innovation, seems well understood and established in most EU-member countries. Despite a broader portfolio of instruments, several respondents maintain that policy practice is to a large extent still influenced by technology and science push models of innovation. Hence, there is little evidence that the broad innovation concept is translated into practical policies and instruments. Although a shift from targeted direct support mechanisms to broader indirect measures has been identified as a major trend over the last 5-10 years, the rationale behind this shift is not the same in all cases. In the Netherlands, for instance, the shift to indirect, generic policies is clearly based on an ideological shift. In Norway, the same shift is seen as a pragmatic way of merging selective instruments into larger and more technology-neutral instruments which are open to a broader spectrum of potential actors.

The policy makers interviewed indicate that the concepts of marketing and organisational innovation are not operational concepts in innovation policy design. A number of related concepts seem more important in the design of national innovation policies. “Social innovation” (NL) and “employee-driven innovation” (NOR) are examples of “neighbouring” concepts which are more in use in practical policy-making than the term organisational innovation. Likewise, “market orientation” and “demand-driven innovation” are concepts which seem more familiar than marketing innovation. And the guiding concept is not without importance. Social innovation is for instance much more focused on the quality of working life (e.g. social security, health, flexicurity) than organisational innovation, the latter being more dedicated to the innovation process itself. Hence, both policy document analysis and the interviews with policy-makers indicate clearly that organisational and marketing innovation are not commonly used in practical policy-making and hence not targeted specifically in the innovation policy mix.

The two most dominant changes in the innovation policy mix across countries seem to be, on the one hand, a general shift from direct measures to indirect support mechanisms, notably through increased importance of R&D tax incentives. On the other hand we see an increased emphasis on global and societal challenges in national R&D and innovation priorities. It seems, however, unclear which roles organisational and marketing innovation can play in this shifting context. If this shift from direct to indirect measures is a general trend, it will be necessary to undertake some kind of analysis of the (increased) relevance of indirect measures to non-technological forms of innovation. One approach could be to study available data on tax incentive schemes in order to find out whether projects and actors within non-technological forms of innovation are using these schemes or not. As for the more targeted measures in use, it seems already clear that most of the instruments which policy-makers refer to as targeting organisational and/or marketing innovation are soft instruments which aim to stimulate networks knowledge transfer and firms’ awareness of non-technological innovation. Although market failure still prevails as the dominant rationale for public intervention in the innovation area, the awareness of system failure is rising. System failure is reported to be most important for soft measures such as network instruments.

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1 Introduction

In past decades, theoretical and particularly empirical innovation research has focused mainly on technological or R&D-based innovation as the determining source, the “engine” (Pessoa 2010: 152) of a developed economy’s growth (Arnold 1997; Grossman/Helpman 1994; Fagerberg 1994). In this traditional framework, innovation activities of firms are perceived to comprise product and technical process innovation (Grupp 1997; Schmidt/Rammer 2007). New products typically contain new technical features that offer new functionalities or allow for new areas of application. New technical processes basically rely on the use of new technologies to enhance efficiency, speed, flexibility or quality of production.

This mere technological view of innovation, however, has been criticised for different reasons. Following the seminal work of Nelson and Winter (1982), researchers of the evolutionary tradition in economics have questioned this R&D paradigm. They suggest that innovation ability is more likely to be based on firm-specific routines and firm-individual heuristics instead of merely single, homogeneous R&D-based innovation strategies. One of the key arguments of evolutionary economics points to the fact that enterprises show considerable heterogeneity in their innovation behaviour and strategies, even within similar framework conditions of sectors or innovation systems (Srholec/Verspagen 2008: 5; Nelson 1991). Following the large strand of theory labelled the “resource-based view of the firm” (Barney 1991; Wernerfelt 1984; Peteraf 1993), which originates in an evolutionary perspective, this heterogeneity is related to the differences in routines, capabilities, skills and experiences of firms (Nelson/Winter 1982; Nelson 1991; Christensen 2002; Teece et al. 1997; Massini et al. 2005). The innovativeness and economic success of firms are thus not necessarily simply about high technology or excessive R&D expenditures. R&D-focused approaches often overlook that a major part of firms’ innovation does not necessarily originate from institutionalised, internal R&D activity (Kline/Rosenberg 1986; Fagerberg 2005; Nelson/Rosenberg 1993; Hansen/Serin 1997; Bender et al. 2005; Marsili/Salter 2006).

This widening of the innovation concept is also reflected in a paradigmatic shift in the understanding of innovation-generating processes within organisations in general and enterprises in particular. The understanding of innovation processes has shifted from the linear, sequential and thus predictable nature towards complex and self-referential cycle models (Kline/Rosenberg 1986; Rothwell 2003; Dodgson 2000; Tidd/Bessant 2009) which account for multiple recursive feedback loops and other sources of innovation knowledge. Innovations do not necessarily have to be radical; on the contrary, they involve incremental social and organisational changes, as well as technological advance. Consequently, innovations are not just the results of scientific work in a laboratory-like environment. They are realised in networks where actors from different backgrounds are involved in the process, setting new demands for innovativeness. As a result, the innovation process is understood as complex and variable.

The latest edition of the Oslo Manual of the European Commission and the OECD which presents the methodological basis for major innovation studies such as the European Community Survey, has taken up Schumpeter’s broad understanding of innovation and proposes an enlarged understanding of innovation (European Commission/OECD 2005). Besides new products, also

new services, production methods, markets or new sources of supply and new types of organisation structures can be regarded as innovations if they help to increase competitiveness and economic success (Schumpeter 1961; Tidd et al. 2005; Totterdell et al. 2002; Lam 2005; Damanpour 1987; Damanpour et al. 1989; Greenan 2003; Drejer 2004; Hipp/Grupp 2005). According to this broad approach, innovations include non-technological aspects such as marketing and organisational innovations as well as technological dimensions such as new products or manufacturing processes.

These developments are also reflected in the targets of the European Commission's flagship initiatives and "Innovation Union" which represents a considerable change in European innovation policy. Instead of a narrow, science-push (technological) understanding of innovation, it explicitly focuses on the broader systemic nature of innovation, including technological as well as non-technological dimensions of innovation and their interplay. Its emphasis on the role of service innovation, design, organisational change, marketing innovation, business model innovation, and social innovation connects to the innovation definition of the Oslo Manual (European Commission 2010a, 2010b). An explicit display of the increased importance of non-technological based forms of marketing innovation is, for instance, reflected in the promotion of design. Within the flagship initiative "Innovation Union" the European Commission has committed itself to a European Design Innovation Initiative.

Since non-technological types of innovation, including organisational and marketing innovation, are considered to contribute significantly to firms' competitive advantage, policy-makers are confronted with the question whether and how these forms of innovation could be supported by corresponding policy instruments. For instance, some authors argue that non-technological forms of innovation are characterised by lower levels of investment costs and risk, and are therefore not in need of specific innovation and technology policy support (Rammer 2011). Moreover, in contrast to technological innovation, the contribution of non-technological innovations cannot always easily be accounted for in concrete numbers. For this reason, their economic relevance and thus legitimacy for policy support remains often rather vague (O'Sullivan/Abela 2007). To date, previous studies have not addressed whether and by which firm-external barriers and obstacles organisational and marketing innovation are particularly affected and how policy support can be justified and designed against this background.

1.1 Research questions

Being a part of the INNO-Grips research project, this work package thus deals explicitly with the question whether and to what degree organisational and marketing innovations are affected by external barriers and obstacles while referring to "systemic failures" in the broader sense and "market failure" as a subset, which would justify innovation policy support. Moreover, innovation must demonstrate its economic impact to justify public intervention. Therefore, to analyse whether and how organisational and marketing innovation could be subject to policy support, the study will differentiate between two essential preconditions: a) the necessary condition that both types of innovation cause positive effects on firms' economic performance, and b) the sufficient condition

that they are affected by market failure in the neoclassical, or system failures in the evolutionary understanding.

In detail, this work package study addresses the following research questions:

- To what degree are organisational and marketing innovations deployed among European enterprises (manufacturing and services) today, and by which structural characteristics of firms is their usage being shaped?
- Which direct and indirect effects of organisational and marketing innovation on the firms' competitive advantage and economic performance can be observed?
- To what extent are organisational and marketing innovations affected by external barriers associated with market or system failure that hamper firms' innovation activities? What does this imply regarding the need for and design of policy support?
- Are there existing policies and policy instruments already in use in EU Member States and beyond to support organisational and marketing innovation? On which aspects of innovation barriers do they focus?

1.2 Structure of the report and methodological approach

To answer these research questions, the study is composed of four major tasks:

- Overview of existing literature and development of a theoretical framework for empirical analysis
- Analysis of the importance and diffusion of organisational and marketing innovation among European manufacturing and service companies
- Analysis based on expert interviews with representatives of European manufacturing firms to figure out whether and to what extent organisational and marketing innovation activities are affected by external innovation barriers, and how firms could be supported in their corresponding activities
- Analysis of existing policy instruments of EU Members States and beyond addressing organisational and marketing innovation and formulation of policy recommendation

According to these tasks, the report is structured into four main parts which are subsequently related to each other.

- In a first step (chapter 2), a theoretical framework is developed to analyse organisational and marketing innovation as the driver of firms' economic success. It clarifies the basic assumptions and premises of this study about the nature of how organisations in general, and firms, in particular, incorporate new elements into their daily operations. Referring to approaches of strategic management research, it elaborates on various aspects of how organisational and marketing innovation generally can be expected to contribute to firms' competitive advantage and thus increased economic performance. Moreover, the concepts

or organisational and marketing innovations are discussed, defined and demarcated against neighbouring concepts of organisational change and organisational learning.

- In the following (chapter 3), the concepts of market and systemic failures are discussed and applied to organisational and marketing innovation. As a result, some working theses are developed in this step about why and how firms' activities in the fields of organisational and marketing innovation might be hampered and remain on a suboptimal level.
- Based on the theoretical considerations, chapter 4 includes the analyses of the importance and diffusion of organisational and marketing innovation across European firms considering several firm characteristics based on quantitative CIS data (size, age, sectoral affiliation, R&D-intensity, production characteristics etc.). These findings are accompanied by additional quantitative firm-level data from the EMS survey that provides more detailed insight into the use of exemplary organisational concepts by manufacturing firms and important internal and external knowledge sources for their realisation. As far as possible, these analyses could also give first hints concerning which aspects of innovation barriers come into play. Moreover, as existing studies have yet not provided a clear picture of the effects of organisational and marketing innovation on firms' economic performance this part also includes multivariate regression analyses regarding whether and how these types of innovations are directly or indirectly related to firms' economic performance.
- Due to the specific nature of organisational and marketing innovation, their contexts of origin within the firm can hardly be addressed by quantitative, standardised data. For this reason, chapter 5 provides in-depth qualitative case interviews with 14 European firms that have recently implemented an organisational or marketing innovation. The focus of the interviews will be on the existence and origins of the specific firm-external barriers and hampering factors in terms of market or systemic failures they have been faced with during the realisation of the innovation projects. In order to answer the question whether and to what extent organisational and marketing innovations are affected by barriers, our analysis does not stop at the descriptive level. To reduce complexity, this part also works out crucial differences and aspects by providing comparisons and typologies across the single case perspectives.
- Finally, the problems of a systemic innovation character faced in these processes will be linked to the policy analysis in chapter 6. This section provides an overview of already existing policy instruments addressing organisational and marketing innovation in EU Member States and beyond. The policy document analysis is rounded off by seven expert interviews with policy-makers in selected EU Member States to figure out their rationales and experiences in supporting these innovation types within their countries.
- Finally, chapter 7 summarises the main findings from all sections and discusses some policy conclusions.

As far as the methodological approach of this study is concerned, the research questions will be answered by using a multi-methodological approach of desk research as well as quantitative and qualitative empirical analysis (figure 1). The “X” indicates that this is the main focus, while “(X)” means that this aspect is additionally covered and reflected by the respective methodological perspective as far as possible.

Figure 1: Link between empirical methodology and research questions

Research questions	Qualitative	Quantitative	Document analysis
Diffusion and structural characteristics of organisational and marketing innovations among European enterprises (manufacturing and services)	(X)	X	
Direct and indirect impact of organisational and marketing innovation on the firms' competitive advantage and economic performance	X	(X)	
Impact of market or system failure on organisational and marketing innovations	X	(X)	
Existing policy instruments in EU Member States and beyond to support organisational and marketing innovation	X		X

Besides quantitative analyses of large-scale firm-level data to examine the diffusion and importance of organisational and marketing innovation among European enterprises, qualitative methodology is used

- to gain detailed insight into the complex reality of firms' innovation processes, to figure out how different market or systemic failures are of practical relevance for firms and whether they act as barriers to their activities in organisational and marketing innovation,
- to provide more detailed information about the motives, rationales and experiences of policy-makers in supporting organisational and marketing innovation.

For both cases, this section will outline the major dimensions that will be addressed in the interviews, the identification of suitable interview partners and firms as well some general remarks about the planned proceedings.

A more detailed description and elaboration on the general proceedings, the underlying data bases, indicators or questions used for quantitative or qualitative analysis as well as their limitations is prefixed at the beginning of each corresponding section.

2 Theoretical framework

Based on the models of endogenous growth theory (Romer 1986, 1990; Lucas 1988), economic growth is substantially explained through R&D investments in the private sector as the most important source of technological progress. Endogenous economic growth models assume that firms invest in new technology through expenditure on R&D if they perceive the opportunity to appropriate the returns on R&D investment in terms of above-average profit achieved by offering new goods and products or implementing technical process innovation. As a consequence, the firms enlarge their market share and, with increasing returns to scale, they enjoy greater production efficiency and a higher rate of economic growth (Schmookler 1966; Segerstrom 1991). Greater production efficiency enables industries to expand their domestic market share through import substitution, to increase local consumption and, at the same time, to penetrate new foreign markets and increase their export share (Shefer/Frenkel 2005; Porter 1990). The relationship between technological progress and economic growth is thereby characterised as a linear, steady-state growth pattern which can be adjusted relatively easily by "turning the knobs of the R&D process" (Verspagen 2005: 504). During past decades, a large number of empirical contributions have analysed the growth impact of the R&D-intensity in terms of product and technical process innovations on growth of productivity (Griliches 1995; Löff/Heshmati 2006; Bronwyn et al. 2010; Lachenmaier 2007) or employment (Entorf/Pohlmeier 1990; König et al. 1995, van Reenen 1997; Smolny 1998, 2002; Pianta 2005) at the firm level. Today, there is broad consensus on the general positive impact of R&D-driven types of innovation on growth in productivity and employment. However, the positive relationship between R&D intensity and firm growth seems to be valid only in the case of R&D devoted to product innovation. In contrast, R&D activities that aim at process innovation are rather negatively correlated with employment growth (Katsoulakos 1986; Lachenmaier 2007). The terms of "innovation" and "R&D", respectively, the level of R&D intensity and the innovativeness and growth of firms and economies have often been equated by mainstream innovation literature in the past (Kirner et al. 2009a; Barge-Gil et al. 2008). Non-technological types of innovation such as organisational or marketing innovation thus would probably not be recognised as drivers of firm growth and innovativeness by neoclassical growth theory as they are not directly associated with R&D and accumulation of technological knowledge.

However, since this narrow focus on private R&D as the predominant determinant of firm growth and innovativeness turned out to be too restrictive for understanding the growth and employment effects of innovation, fields of non-technological innovation began to attract more and more attention. Firstly, against the backdrop of the ongoing structural change from the secondary (industrial) to the tertiary sector (services) in developed economies, a mere technological perspective on innovation appeared to be outdated, because of its bias towards innovation in manufacturing. Thereby, it is not able to fully capture the field of non-technological innovation taking place in the service sector (Hipp/Grupp 2005; Hipp et al. 2000).

Secondly, and at the latest since the study of Womack, Jones, and Roos (1990) on the concept of "Lean Production" it has been broadly acknowledged that changes in the organisation of manufacturing and work processes are able to contribute to firms' competitiveness and economic success (Lam, 2005; Hipp/Grupp 2005). It was this dissatisfaction with R&D-related indicators that

led to the development of a new set of “science, technology, and innovation (STI)” indicators by the first edition of the Oslo Manual in 1992. It extended the then prevailing R&D focus of the Frascati Manual (OECD 1963) to the broader term of “innovation” and proposed harmonised guidelines for collecting and interpreting firms’ innovation measures (Freeman/Soete 2009). Thus, it is widely recognised today that innovation occurs through numerous channels besides R&D. A sole focus on R&D and technological forms of innovation runs the risk of underestimating the innovativeness and competitive performance of firms (Hall et al. 2009; Nelson 2000; Kline/Rosenberg 1986; Kleinknecht et al. 2002; Prahalad/Hamel 1990; Fagerberg 2005; Smith 2005; Arundel 1997).

The decline of the R&D focus is, on the one hand, driven today by a shift of analytical focus towards innovation-related activities that go beyond the scope of formal R&D, and, on the other hand, by a changing understanding of the nature of the innovation process itself, for instance in the works of David (1996), Foray (1998), Lundvall/Johnson (1994) or Edquist/Texier (1998). The main developments are:

- A broader understanding of firms’ internal innovation resources expressed in terms of “routines”, “capabilities” or “competences” (Nelson/Winter 1982; Winter 1987; Teece/Pisano 1994; Prahalad/Hamel 1990; Grant 1991), by generally referring to “knowledge” as the most important predictor for innovation (e.g. Grant 1996; Spender/Grant 1996).
- The increased appreciation of engineering, design, production and distribution activities (Kline/Rosenberg 1986; Vincetti 1990; Walsh 1996; Freeman/Soete 1997; Hansen/Serin 1997; Koschatzky et al. 2001) as well as investment in capital equipment related to innovation are further determinants of successful innovation (e.g. Evangelista et al. 1998; Evangelista 1999).
- The awareness that the firm’s ability to exploit systematically the effects produced by new combinations and uses of components and practices in the existing stock of knowledge may be another crucial enabler for successful innovation (David/Foray 1995; Kline/Rosenberg 1986); for example frequently labelled as “architectural innovation” (Henderson/Clark 1990) or “innovation without research” (Cowan/Van de Paal 2000). As Kline and Rosenberg (1986) argue, when firms are faced with the necessity to innovate they first look into their existing stock of knowledge, and if the answer cannot be found there, they then consider whether it makes sense to spend on R&D or not.
- The increasing recognition that firms are embedded in social systems of innovation (e.g. Lundvall 1992; Edquist 1997; Nelson 1993). This highlights the systemic nature of innovation processes, emphasising that firms do not normally innovate in isolation, but in collaboration and interdependence with other organisations (e.g. suppliers, customers, competitors, etc.), non-profit entities (e.g. universities, schools, government ministries), institutions (e.g. laws, rules, norms), and other social entities (e.g. local residents, consumers). Moreover, firms may intentionally make active use of their surrounding external sources in terms of collaboration (e.g. Dyer/Singh 1998; Nooteboom 1999), user-driven innovation (e.g. Lundvall 1985; von Hippel 2004), or “open innovation” (e.g. Chesbrough 2003).

- As a consequence of the more systemic view of innovation, increasing attention is also given to the need for more holistic policies and a wider range of policy instruments which can target all parts of the innovation system (Smith 2000; Flanagan et.al. 2010).

As a result, the innovation process is today understood to be highly complex and variable. There is no one best way to innovate. Instead, against the background of modern, knowledge-based economies, the use of R&D as a proxy or surrogate measure for a wider range of innovation is no longer adequate (Kline/Rosenberg 1986; Freeman 1994; Arundel et al. 2008; Raymond/St-Pierre 2010) and the theoretical focus needs to shift “from R&D to learning processes”, as all knowledge produced within a firm cannot be attributed to formal research activities (Foray 2006).

The recognition of non-technological aspects like marketing and organisational innovation as drivers of firms’ competitive advantage and growth goes hand in hand with certain premises of how firms as organisations have to be understood and conceptualised. As mentioned above, the recognition of organisational and marketing as distinct types of innovation means not only broadening the innovation concept, but also employing a different understanding of innovation processes.

Both marketing and organisational innovation aim at the renewal or improvement of interactive and interdependent working and communication processes between firm-internal (e.g. employees, departments, groups and teams) and/or firm-external (e.g. collaboration partners, users and customers) social entities. Thereby, innovation activities for generating organisational and marketing innovation not only take place in close social processes of interaction, negotiation, and learning but are even targeted to shape these relationships by themselves. Thus, they should be regarded as being of systemic and complex nature according to the complex and self-referential cycle model of innovation (Kline/Rosenberg 1986; Rothwell 2003; Dodgson 2000; Tidd/Bessant 2009).

Furthermore, following the seminal work of Schumpeter (1912), many authors emphasised the point that the recognition of non-technological dimensions of innovation such as the adoption and (re-)organisation of internal business processes and routines, external relations or novel marketing activities represent an important development in organisation theory (Boer/During 2001, Baranano 2003, Grant 1991, Amit/Shoemaker 1993, Hamel/Prahalad 1993) and led to the further development of the concept of organisational innovation by drawing attention to “intangible” factors, which account for the economic success and performance of enterprises (March/Simon 1958; Penrose 1959; Selznick 1957; Chandler 1992). Finally, innovation management theory underlines the importance of integrating product, technical process innovation with organisational and marketing innovation in order to increase the firm’s ability to transfer new ideas and business opportunities into successful market solutions (Tidd/Bessant 2009; Porter 1996; Cozzarin/Perzival 2006). In line with this, firms gain persistent competitive advantage from the firm-specific linkage of technological and non-technological elements of innovation.

Departing from these introductory considerations that set the evolutionary background for this report, the following sections will outline a conceptual framework to empirically approach organisational and marketing innovation on the firm’s level. Reference will be made to the basic understanding of firms as open, learning social systems as a necessary requisite for organisational

and marketing innovation. Against the backdrop of strategic management theory it will be discussed why organisational and marketing innovation can be considered as contributing to firms' economic success. Basic terminology as well as an overview of different dimensions of both types of innovations will be provided

2.1 Organisations and enterprises as open, learning social systems

On the level of organisational and firm theory, the theoretical shift in innovation research from a linear, sequential to a systemic, complex and self-referential understanding of innovation processes is reflected by conceptual approaches that see organisations in general, and firms in particular, as open, natural systems functioning in a more or less complex and dynamic environment. Contingency theory, open system theory and organisational design theory, for example, suggest that structural aspects of organisations are related to the environmental context of organisations (March 1976; Nystrom/Starbuck 1981; Scott/Davis 2007). There is no universal best way of organising. Instead, successful organisation is contingent on, and should be in compliance with the external environment (Lawrence/Lorsch 1967; Hofer 1975; Pennings 1992). In this view, changes in contingent environmental factors such as competition, demand, politics, society, resources and technology call for organisational adaptations and adjustments. In turn, some elaborate organisational designs might also allow organisations to be more adaptive to environmental dynamics than others (Burns/Stalker 1961).

In contrast to this structural perspective, which highlights the output dimension, other scholars emphasise that innovation is a process of bringing new, problem-solving ideas into use (Amabile 1988; Kanter 1983). According to this, non-technological innovation like organisational and marketing innovation can contribute to enhancing the organisation's innovation ability in terms of being more intelligent and creative (Glynn 1996; Woodman et al. 1993), having a higher capability to learn effectively (Senge 1993; Argyris/Schön 1978), and creating new knowledge (Nonaka 1994; Nonaka/Takeuchi 1995). This cognitively oriented strand of organisation and management research refers to the idea that individuals develop mental models, belief systems, and knowledge structures that they use to perceive, construct, and make sense of their environment and to make decisions about what actions to take (Weick 1979, 1995; Walsh 1995). As individuals are limited in their ability to process the complex variety of stimuli contained in their external environment (described by Simon as "bounded rationality") they develop such "mental representations" to filter, interpret, and reconstruct incoming information (Lam 2005). Organisation and management researchers have extended this view to the organisational level. Thus, organisations develop collective mental models and interpretative schemes which reduce complexity and allow managerial decision-making and organisational action (Nooteboom 2009). Central to theories of organisational learning and knowledge creation is the question of how organisations translate individual insights and knowledge into collective knowledge and organisational capability (Lam 2005; Simon 1991).

The underlying assumptions of these organisational theories are shared by the evolutionary approach, which turned out to serve as a fruitful basis for the analysis of organisational change and organisational innovation (Armbruster et al. 2007). Building on the prior theoretical contributions of the behavioural theory of the firm (March/Simon 1958; Cyert/March 1963), organisational learning (March/Olson 1976; Argyris/Schön 1978) and the Schumpeterian approach (Schumpeter 1912), evolutionist authors such as Nelson/Winter (1982), Dosi/Marengo (1994) or Teece/Pisano (1994) recognise firms as complex learning organisations which develop different, heterogeneous ways and strategies to solve problems and challenges evoked by their specific environments. According to the evolutionary view, those firms which are not able to meet the market and environmental requirements adequately and therefore do not gain economic success will be eliminated by their environment and its market mechanisms (Nelson/Winter 1982, Nelson 1991, Chandler 1992, Dosi/Marengo 1994, Dosi/Teece 1998, Prahalad/Hamel 1990, Dosi et al. 2000; Nooteboom 2009). The evolutionary approach therefore strictly rejects the neoclassical assumption of completely rationally acting firms and has replaced it by the concept of organisational learning as the main reason for organisational change and organisational development.

Based on such an understanding of organisations, their formal structure as well as the way they operate and evolve becomes a key element in analysing firms' behaviour and performance. As a consequence, the superior goal of innovation management is not to identify the best solution in an absolute manner, but to develop feasible and workable solutions that turn out to be fruitful under the current external frame work. The fact that these solutions have to be constantly reflected, adjusted or even discarded over time represents the core of evolutionary thinking.

To answer the research questions and analyse organisational and marketing innovation as types of non-technological innovation, the study thus strongly refers to the evolutionary understanding of organisations and enterprises, and comprehends them as open social learning entities which develop and evolve themselves through constant interaction with and adjustment to their external system environment. Following this perspective, enterprises' innovation activities might put forth alternative paths of knowledge generation and accumulation than science-based modes of expert knowledge. In the terminology proposed by Lundvall/Johnson (1994), "learning-by-doing, learning-by-using, learning-by-interacting, learning-by-producing and learning-by-searching" should – next to R&D activities – clearly be recognised as essential sources of innovation.

2.2 Strategic management perspective

A major goal of this work package is to analyse if and how organisational and marketing innovation contributes to firms' economic success and growth. For this purpose, this study relies on two main distinctive approaches of strategic management literature which explicitly focus on the question why some firms persistently outperform other firms (Barney/Clark 2007; Welge/Al-Laham 2008). The first, and older one, was originally founded by Michael Porter (1979, 1980, 1985) and relied strongly on the "structure-conduct-performance" (SCP) paradigm of industrial organisation economics (Bain 1956, 1968), which attempted to develop a concept for the optimal economic

market structure at the industrial level. On the contrary, the second major approach of strategic management explains persistent differences in firms' performance and sustainable competitive advantage by firm-specific sets or bundles of strategically relevant resources and resource combinations. Correspondingly, this approach was named the "resource-based view" or "resource-based theory" and refers to the works of Wernerfelt (1984), Rumelt (1984) and Barney (1986). In order to explain why and how organisational and marketing innovation can contribute to such persistent competitive success of enterprises, both approaches should be taken into consideration.

2.2.1 Market-based view

Starting from the criticism that the market behaviour of actors had been frequently disregarded in empirical studies, Porter (1981) suggested that the economic performance of firms is also determined by their market behaviour, which is shaped by their competitive strategies. Finally, he came to the conclusion that a firm's competitive advantage is determined by two basic aspects: the nature of the industry in which the firm is embedded, and the strategic decisions by which it positions itself within this industry (Hoskisson et al. 1999).

According to Porter, the competitive advantage of firms is determined by their relative product-market position, which can be strategically managed by adapting to the predominant sector- and market-specific competitive forces and choosing the optimal competitive strategy. This analysis of the sector's competitive market structure should thereby not be limited to the degree of concentration of existing competitors. Instead, the firms should also focus on the characteristics of customers, suppliers, the probability of entrance of new competitors, or the risk of its own products being substituted by products of competitors (Porter 1999). Due to this line of reasoning, Porter's approach has been named the "market-based approach".

Porter derived five universal competitive forces of economic markets for which he claimed universal validity, regardless of their national or international, product- or service-oriented character. These forces are (Porter 1999): the conditions for the entry of new competitors, the threat from substituting products, the bargaining power of buyers, the bargaining power of suppliers, and other forces that are released by the concurrency of already existing competitors. This "five forces framework" describes competitive imperfections in product markets and how they can develop their effects on the firms' possibilities to make profits by raising prices above a competitive level. The most important strategic goal of managers should thus be to identify and pursue the optimal market positioning of the enterprise in such a way that it can prevail against these influencing market forces to the best possible extent. Starting from these market forces, Porter developed three basic types of competitive strategy for firms to adapt to their respective competitive frame work (Porter 1999): i) the strategy of differentiation, ii) the strategy of cost-leadership, and iii) the niche-strategy.

The market-based view assumes that firms are originally endowed with similar sets of strategic resources and that these resources are to a large part mobile across firms within common markets (Porter 1991; De Wit/Meyer 2004). "Resources are not valuable in and of themselves, but because they allow firms to perform activities that create advantages in particular markets" (Porter 1991).

Hence, according to the market-based perspective, resources themselves could never be the starting point for strategy formulation. Instead, the development and accumulation of resources necessarily needs to follow the demands of market and industry.

From the market-based perspective, the effects of marketing innovations on the economic performance of firms appear quite obvious. Marketing innovation represents a powerful instrument to build up, maintain, and strengthen the market positioning of a new or already existing product by supplementing its mere physical and functional characteristics with immaterial, intangible aspects like image, reputation and emotion. Thus, marketing innovation can help to strengthen the differentiating features of a firm's product portfolio according to the selected strategic options. Moreover, marketing innovation, for instance, can help to erect or reinforce market entry barriers for new competitors (e.g. trademark protection, public branding, and distribution channels) as well as to diminish the threat of substituting products.

Looking at organisational innovation, the market-based perspective seems more difficult to apply because organisational innovations as such do not become visible on the market in a direct manner. Instead, the implementation of organisational concepts and methods in the work and production processes of a firm can contribute to achieving certain product performance characteristics like superior quality, cost leadership, increased adherence to delivery dates, higher flexibility and increased speed, or by enhancing innovation activities in general. Hence, the organisational innovations can serve as an enabler to support the firm's strategic market positioning by linking strategic market goals with an appropriate design and organisation of internal processes in terms of a "strategic fit" (Porter 1996).

2.2.2 Resource-based view

Similar to the theoretical strands of industrial economics, the dependent variable of the resource-based theory of the firm is the attainment of persistent economic success of an enterprise through competitive advantage. In contrast to the preceding approaches of the market-based perspective, however, the resource-based theory of the firm proceeds from the assumption that the economic success and competitive advantage of firms cannot only be determined by their market environment, but rather by their internal assets and resources (Schendel 1996).

Having mainly focused on external, respectively market-driven influence factors of competitive advantage in the 80's, the research approach of the resource-based view of the firm has drawn attention to firm-internal conditions and resources as the explaining variable for the competitive and economic success of enterprises. To date, it has gained remarkable relevance and can be probably be considered as the "most influential framework" (Barney et al. 2001) or as the "dominating approach" (Moldaschl/Fischer 2004) in strategic management research. The resource-oriented approach was mainly founded by the important works of Wernerfelt (1984), Barney (1986, 1991), Dierickx/Cool (1989), Grant (1991) and Peteraf (1993). However, it may be assumed that this approach can be traced back to the pioneering works of Penrose (1959) and Selznick (1957) who have already drawn attention to intangible, behavioural factors that contribute to the economic success and competitive performance of enterprises.

The basic assumption of all resource-based approaches relies on the existence of a firm-specific pool of resources which distinguishes an enterprise from its competitors in a significant and sustainable way (Wernerfelt 1984; Barney 1991; Peteraf 1993). Based on that axiom, the resource-based theory seeks to explain the heterogeneity in firms' economic performance and attainment of competitive advantage (Mahoney/Pandian 1992; Peteraf 1993; Burr 2004). An enterprise is only assumed to be successful, if it either possesses a unique and superior set of resources or is able to exploit them more effectively or efficiently than its competitors (Billerbeck 2003; Burr 2004). Resources are - if isolated from each other - themselves not of great strategic importance for an enterprise. To generate a strategic advantage, they need to be deployed and coordinated effectively and efficiently. This is supposed to be achieved by organisational routines and competencies (Penrose 1959; Freiling 2001). Competences can thus be understood as the ability of an enterprise to make better use of its resources than its competitors. Those competences in which the enterprise is superior to other competitors are also labelled as "core competences" (Prahalad/Hamel 1990). As they and other authors argue, such core competences are especially characterised by their high value, high specificity, their rareness, the difficulty of imitation and their non-substitutability by other resources (Barney 1991; Dierickx/Cool 1989).

Hence, "resources" for competitive advantages are created either inside the enterprise or through interaction with external actors and cannot be acquired on the market. The firm must create them by itself, or assimilate them after a period of learning (Teece et al. 1997). In this sense, organisations are understood as bundles of specific and individual intangible capabilities and competencies. In contrast to the market-oriented view, resource-oriented concepts do not put their analytical focus on the external market environment, but rather on the internal and firm-specific resources and competencies, as they are assumed to be a more stable and reliable basis for the development of a business strategy (Prahalad/Hamel 1990).

A key feature of the resource-based approaches which is closely related to evolutionary theory is to highlight the fact that organisational capabilities and competencies only become efficient when they are "routinised" and turn into "repeated actions" within the organisation or between different organisations in a network or collaborative setting. Nelson/Winter (1982) also use the notion "routine" in a very flexible, even unspecific (Pentland/Rueter 1994; Kappelhoff 2004) way. Following them, a routine encompasses various knowledge-based abilities which are fixed in the firm's organisational guidelines or in the employees' minds, such as repetitive patterns of action as well as individual skills or the effectiveness of an organisational or individual performance. This view has often been criticised, because routines and competences are usually located at the organisational level and describe a collective pattern of action or particularly collective action potentials (Becker 2004; Gersch et al. 2005) and thus have to be distinguished from "individual skills" that are located at the individual level. Routines represent firm-specific repetitious patterns of action and therefore are supposed to have a considerable impact on the innovation ability and economic success of an enterprise (Nelson/Winter 1982; Nonaka 1991; Tidd et al. 2005; Becker/Zirpoli 2006) as they ensure that available resources are being successfully transformed into the desired innovative outcomes.

Routines are not to be confused with "brilliant improvisation" or mechanisms of single problem-solving, because there is neither a general-purpose routine nor is problem-solving to be

considered as highly patterned and repetitious (Winter 2003). Hence, the element of repetitiveness is essential. The existence of individual skills as well as organisational routines necessarily implies some automaticity in their implementation and diffusion, since it is only on this condition that routines are economically efficient (Coriat/Leguehennec 2007). It also becomes apparent that the notion of competencies and routines are often used synonymously. This is a visible expression of the conceptual diffuseness of which the resource-based approach is often blamed for (Barney/Clark 2007; Priem/Butler 2001). As we would like to propose instead, the concept of competencies seems more likely to be linked to a specific, outstanding ability which the firm possesses, while the concept of routines stresses the dynamic aspect of recurrent and repetitious patterns of behaviour as it was originally introduced by March/Simon (1958).

Last but not least, to explain the evolution and adaption of organisational routines and competencies according to external requirements, the concept of "dynamic capabilities" was developed. Dynamic capabilities represent one important approach within the resource-oriented research, which has been widely developed and recognised through the articles of Teece et al. (1997) and – with a different connotation – Lei et al. (1996), Eisenhardt/Martin (2000), Zollo/Winter (2002) and Helfat/Peteraf (2003). The fundamental characteristic of this concept is the fact that the firms' rapidly changing environment is taken into account (Helfat/Peteraf 2003; Moldaschl/Fischer 2004; Schreyögg/Kliesch 2005a). Facing the increasing market-dynamics, the concept of dynamic capabilities overcomes the static and asset-oriented perspective of the traditional resource-based view and tries to incorporate adaptability and change into the concept of organisational competence. Thus, dynamic capabilities describe the firm's ability of permanent reformation and recombination of its resources to adapt to its changing market and environmental framework (Montgomery 1995; Teece et al. 1997).

In distinction from the traditional resource-based approach, the concept of dynamic capabilities especially responds to the often mentioned criticism that (core) competences and routines can quickly change into "core rigidities" (Leonard-Barton 1992). This aspect represents the "dysfunctional flip side" of competences and routines which can lead to path dependency or structural inertia caused by economical and cognitive-emotional processes in dynamic environments (Schreyögg/Kliesch 2005a, 2005b; Teece et al. 1997).

Looking at marketing innovations from a resource-based perspective stresses the process view. Against this backdrop, marketing innovations can be understood as the ability of firms to develop and implement certain routines and capabilities to identify and address customer needs and to translate them into distinct marketing activities (Wernerfelt 1984; Barney 1991; Grant 1996; Teece et al. 1997). Additionally, as marketing innovations might also open up new information channels to source information and knowledge about customers and users, they also contribute to the accumulation of intangible resources and assets such as market knowledge and firm reputation. In this sense, marketing innovation triggers the development and evolution of new intangible and immaterial bundles of resources (e.g. market knowledge) and capabilities (e.g. customer-orientation) which in turn helps to increase its economic and competitive performance (Atuahene-Gima 2005; Tether et al. 2012). Likewise, organisational innovation aims directly at the creation or adaptation of internal routines and processes which either result directly in competitive advantage

and economic success, or which allow for the acquisition of new resources, competencies or stocks of knowledge that might serve as enablers for other innovation activities.

2.3 Organisational and marketing innovation

To identify the full range of innovation that firms can choose from to increase their performance and success in improving economic outcomes requires a broader framework than merely technological product and technological process innovation. Phillips (1997), for instance, separates technological and non-technological innovation, and includes new marketing strategies and changes to management techniques or organisational structures in the latter category. Technological innovation is usually seen as encompassing product and technical process innovation. In its current edition, the Oslo Manual of the European Commission and the OECD (2005), which presents the methodological basis for major innovation studies such as the European Community Survey, has taken up Schumpeter's broad understanding and proposes an enlarged understanding of innovation. While the second edition of the Manual already covered service innovation (as the non-technological dimension of product innovation), the Manual now comprises also organisational and marketing innovation in terms of the non-technological area of process dimensions. By this extension, the Oslo Manual now provides a more complete framework, which is able to capture those changes that affect firm performance and contribute to the accumulation of knowledge.

However, it should be made clear at this point that technological and non-technological types of innovation should by no means be played off against each other. They do not represent exclusive options for firms' innovation strategies. On the contrary, different fields of innovation merely highlight the different dimensions by which a firm can reach competitive and economic success. Moreover, if a firm manages to exploit the potentials of combining different fields of innovation within an innovation project, this might even maximise the economic impact that could be achieved (Porter 1996; Som 2012)

2.3.1 Dimensions and effects of organisational innovation

Having outlined the theoretical backdrop of this study above, this section clarifies which dimensions and aspects are summarised under the umbrella of organisational and marketing innovation in the context of this study and which positive economic effects have been given shape in the existing literature so far.

First of all, there is vast majority of different approaches and definitions to organisational innovation in literature (for an overview, see e.g. Lam 2005; Armbruster et al. 2007, 2008; Barañano 2003). This might be partly due to the circumstance that the concept of organisational innovation is addressed by a large number of different disciplines using different theoretical concepts, different empirical instruments, and different indicators. One of the most important efforts undertaken to improve and develop a widely agreed definition and measurement guideline for organisational innovation is represented by the 3rd edition of the Oslo Manual (European Commission/OECD

2005). Because the definition provided by the Oslo Manual today still represents the most widespread concept - in the sense of the lowest common denominator - for empirical research on organisational innovation building the basis for the operationalisation in the Community Innovation Survey (CIS), this report also uses the Oslo Manual definition; last but not least to secure the comparability and compatibility to previous studies within the European research context.

As defined in the latest edition of the Oslo Manual (European Commission/OECD 2005), organisational innovations include "...the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations." Against the background of the evolutionary view, organisational innovations can therefore be understood as a result of the firm's adaptation process by developing and implementing two different types of organisational innovations: structural organisational innovations and procedural organisational innovations (Pleschak/Sabisch 1996; Armbruster et al. 2007).

In the first place, structural organisational innovations may influence the change and improvement of responsibilities, accountability, command lines and information flows as well as the number of hierarchical levels, the divisional structure of functions as well as the separation between line and support functions. Such structural organisational innovations comprehend for instance the change from an organisational structure of functions (product development, production, human resources etc.) into one of product or customer-oriented lines, segments, divisions or business units (Kinkel et al. 2004). Secondly, procedural organisational innovations affect the processes, operations and patterns of behaviour of an enterprise. These organisational innovations thus change or implement new procedures, processes or patterns of behaviour within the firm. Some examples are simultaneous engineering, zero-buffer-rules, just-in-time-concepts or continuous improvement processes (Blessin 1998; Kinkel et al. 2004). Moreover, authors like Black and Lynch (2005) view organisational innovation as also including components such as workforce training or shared rewards (incentives such as profit sharing or stock options). As the examples show, it is not always possible to clearly distinguish between the structural and procedural dimension, because changes in processes or procedures consequently often lead to changes in the organisation structure and vice versa.

Another differentiation of organisational innovation aims at the intra- and inter-organisational dimension (Armbruster et al. 2007; Coriat 1995). While intra-organisational innovation occurs within a firm, inter-organisational innovation includes new organisational structures or procedures that go beyond an organisation's border. This comprises, for example, new organisational structures to participate in all forms of collaboration with other external partners, for instance, the establishment of new types of collaborations with research organisations or customers, new methods of integration with suppliers, or the outsourcing or subcontracting for the first time of business activities in production, procuring, distribution, recruiting and ancillary services (European Commission/OECD 2005). This external dimension of organisational innovation thereby strongly refers to the systemic, evolutionary view of innovation which comprehends firms as organic and social rather than mechanical and economic actors who are embedded in systemic networks of innovation and knowledge. In this sense, organisational innovation may serve as a key enabler for firms to seize and exploit technologies, knowledge and other impulses that are available outside

the firm to extend their own internal stock of knowledge. This might encompass formalised expert knowledge as well as rather tacit forms of knowledge (e.g. in terms of crowd-sourcing activities).

Obviously and not least because of the common evolutionary backdrop of innovation system approaches, the term of organisational innovation is closely related to neighbouring concepts of organisational change, organisational learning and organisational transition. In this study, we will differentiate organisational innovation from organisational change by the strategic intention behind the innovation concept. Thereby, we follow the definition of Schumpeter (1912) who argued that the distinguishing element of innovation besides its novelty lies in the realisation or implementation and thus in the contribution to the economic success of a firm. While organisational change might encompass both conscious and unconscious (evolutionary) changes and adaptations of organisations to their dynamic environment, organisational innovation should be narrowed in this study to the intentional and planned development and implementation of organisational concepts or structures new to the firm in order to achieve certain improvements in its competitive advantage and economic performance. In consequence, every organisational innovation results in organisational change, but not every organisational change can be seen as an organisational innovation. Moreover, organisational learning describes the ability and processes of organisations and their members to identify, absorb, accumulate and exploit new knowledge and practices of problem-solving internal and external to the firm (Senge 1993; Yang et al. 2004). Vice versa, organisational innovations can be targeted to improve the ability of learning, for instance by establishing new organisational interfaces to external partners and networks. Last but not least, organisational transition can be distinguished from organisational innovation and organisational change as it describes how to move people and organisations through the stages to make organisational innovation or changes work (change management) (Bridges 2003).

Unlike product, service and marketing innovations, organisational innovations are not directly implemented in the market. But their impact may directly and indirectly affect the marketability of the products and services provided within these organisational framework conditions. Organisational innovation could not only be thought in terms of firms' responses to technical change by being a necessary precondition for technical innovations like new products or new technical processes. Organisational innovation can also have an important impact on firms' performance on its own. Ever since the study of Womack et al. (1990) on the concept of "Lean Production" it has been broadly acknowledged that changes in the organisation of manufacturing and work processes are able to contribute to firms' competitiveness and economic success (Tidd et al. 2005; Lam 2005). It can help to improve the quality and efficiency of work, enhance the exchange of information, and improve firms' ability to learn and utilise new knowledge and technologies (Lam 2005; Armbruster et al. 2007; Heidenreich 2009; Rammer et al. 2009; Chavez 2011; Zhou 2008; OECD 2005). According to Armbruster et al. (2007), the benefits of organisational innovation for firms can be distinguished by the following three dimensions:

- Organisational innovation as a **distinct form of innovation**: the implementation of a new work organisation (e.g. just-in-time, decentralisation, job enrichment, team work) which could directly result in substantial improvements of organisational performance, for instance, in terms of quality, flexibility, productivity, speed (Wheelwright 1984; Wheelwright/Clark 1992; Wildemann 1997; Reed et al. 2000; Ichniowski et al. 1997; Kirner

et al. 2009a; Janz et al. 2003; van Leeuwen 2002; Faems et al. 2005; Belderbos et al. 2004; Cincera et al., 2003; Hall/Mairesse 1995; Schmidt/Rammer 2007; Mothe/Thi 2010). For instance, a direct effect of organisational innovation can be observed in terms of an improved quality of service offers and a shorter reaction time to customer needs, whereas cost reductions are of limited relevance as an outcome (Schmidt/Rammer 2007). However, some studies suggest that the direct economic impact of organisational innovation is moderated by the infrastructural and competitive framework. For instance, Bresnahan et al. (2002) highlighted the complementary nature of product and service innovation, information technology and workplace reorganisation. But they showed that new work practices only result in improvements of firms' performance when they are combined with heavy investments in either human capital or ICT. With regard to the firms' competitive environment, Schmidt and Rammer 2007 showed that a market characterised by fast-changing technologies, short product life cycles, and, in particular, a high risk that their own products can be easily substituted by competitors increase the probability that a firm introduces an organisational innovation (and marketing innovation).

- Organisational innovation as an **enabler for other types of innovation**: a growing number of empirical studies highlights the complementarities between product, technical process and service innovation on the one hand, and organisational innovation on the other hand (Evangelista/Vezzani 2010, 2011; Koufterous/Marcoulides, 2006; Koufterous et al. 2001; Mothe/Thi 2010; Schubert 2010; Schmidt/Rammer 2007; Battisti/Iona 2009; Battisti/Stoneman 2003, 2010; Galia et al. 2012; Ebersberger et al. 2011). For instance, organisational concepts such as simultaneous engineering or the participation in innovation collaboration increase the probability of successful implementation of product, technical process or product-related service innovation (Kinkel/Som 2010; Kirner et al. 2009b; Schubert 2010; Belderbos et al. 2004; Faems et al. 2005).
- Organisational innovation as a **prerequisite** for knowledge accumulation in firms: organisational innovation can enable firms to increase their ability to acquire, create and make the best use of competencies, skills and knowledge. This dimension is closely linked to organisational and managerial practices (e.g. design and management of inter-organisational interfaces, training and qualification programmes for human resources, managing of external technology sourcing) (Som 2012; Som/Zanker 2011; Katsoulakos/Ulph 1998; Cassiman/Veugelers 2002; Belderbos et al. 2004; Hamel 1991; Naranjo-Valencia et al. 2010, Naranjo-Valencia et al. 2011; Sanz-Valle et al. 2011; Martins/Terblanche 2003; Mothe/Thi 2010). For instance, the introduction of knowledge management systems is usually associated with higher flexibility, adaptability, competitive advantage, and organisational performance (Pralhad/Hamel, 1990; Grant, 1996). While many empirical studies recognise the positive impact of knowledge management systems, only few provide conclusive evidence (Becerra-Fernandez/Sabherwal 2001) or even a weak significance of the relationship between the two (Chen et al., 2004). For French firms, Kremp and Mairesse (2004) found, however, that firms having knowledge management policies are likely to innovate more extensively and to have higher

productivity. Uhlaner et al. (2007) showed, for a panel of Dutch firms, that firms implementing knowledge management have higher growth than others.

It is obvious that there is a vast variety of organisational innovations differing in terms of type and focus of these concepts. So any proposed attempt of typology or categorisation is of analytical nature. In reality, most organisational concepts address different aspects of business performance at the same time. On the one hand, this circumstance is an important reason for the need for specific performance indicators to analyse their impacts. On the other hand, this leads to serious problems of identifying and isolating a specific impact of single concepts by the use of such indicators which have to be taken into account in our empirical analysis (Som 2012; Armbruster et al. 2007, 2008).

2.3.2 Dimensions and effects of marketing innovation

Marketing innovation has been addressed by Schumpeter as the opening of new markets (1912). Having been firstly introduced into the third edition of the Oslo Manual, marketing innovation is clearly distinguished from product innovation, as the latter includes technical specifications and functional characteristics, while the first aims at the appearance of the product on the market (Mothe/Thi 2010). Today marketing innovation is defined along various dimensions, as can be seen by the definition available in the Oslo Manual (American Marketing Association 2007; European Commission/OECD 2005). Marketing innovation aims at changing the market relations of a firm (Johne 1999). That includes changes in the communication with customers or in other words new approaches to information flows into the market by new strategies in product promotion or information flows into the firm by new techniques in market research. Another type of marketing innovation is building up new distribution channels to serve new markets or existing markets in a new way (Johne/Davies 2000). Finally the product design and the pricing could be a subject of innovation (Moreira et al. 2012), to change the appeal of product for the customers without changing basic functionalities. These three dimensions of marketing innovation will be more addressed in more detail below. Although there are connections to other theoretical concepts or types of innovation, marketing innovation refers to target-oriented activities new to the firm to change its market relations.

The OSLO Manual's approach thereby differs from the understanding of marketing as a broad field of research as defined by the American Marketing Association (2007) with a rather multidimensional perspective. Here marketing is understood as a general, strategic orientation of management which relies on some kind of a market-related "meta-competence" of firms (Meffert/Burmann 2012). Reflecting the firms' general ability to interact with its relevant markets, this research approach analyses the connections of marketing to all other relevant business processes, especially to product innovation. The distinction between product innovation and marketing innovation is of little use for this perspective. Although this study is based on the widely used definitions established by the Oslo Manual (European Commission/OECD 2005) it might be of interest for future research to consider and discuss these conceptual differences in more detail to create a stronger link between these to strands of marketing research. Nevertheless, with the

Oslo Manual setting up the common framework for innovation research in Europe, this report again decided to follow the definition of marketing innovation provided by the Oslo guidelines.

A new approach to product promotion or market research can be considered as a marketing innovation. The growing importance of this kind of activities is driven by the globalisation of sales and its need to adapt products to the preferences of customers with different cultural backgrounds. The sales in established markets are also under the pressure of an ongoing differentiation of customer groups (Krason et al. 2003). To be well-informed about fragmented groups of potential customers becomes vital to enterprises. Additionally, the shift from classical media, such as print media or television, to internet-based communications in the so-called social media, changes the patterns of communication with the customers. Whilst the unidirectional communication channels of the classical media separated advertisement and market research, bidirectional communication opens up new approaches to the flows of information between firms and customers (Kirtiřa/Karahan 2011). This puts a growing pressure on firms to innovate their communications into the market: the new media is still fast changing; new trends like mobile marketing appear (Kaplan 2012) without clear evidence of their impact and efficiency. Under these circumstances it is of special interest how enterprises cope with marketing innovations towards the flows of information. Which resources are needed to keep track of changing preferences of the customers and advertise with a high impact in the struggle for attention? The capacity of organisations to include new flows of information especially from the new media into their organisational routines is not just linked to organisational structures but also to soft factors like the culture of an organisation or the age of the employees.

This dimension of marketing innovation overlaps with other theoretical concepts: market orientation focuses on the capacity of an organisation to absorb market information and react to them (Naidoo 2010). While market orientation describes an ability of a firm on a meta-level, marketing innovation means target-oriented activities; in this dimension of marketing innovation the implementation of new manners of gathering and providing information. These improved flows of information can boost other types of innovation. For example information, gathered by sales and marketing, should be included in the innovation process to serve better customer demands (Rosenberg 1988; Moenaert et al. 1994). Furthermore, product innovation can still enable the innovative usage of information about customer behaviour, for example if new electrical devices log information about such usage. Although advertisement is important for the promotion of innovative products, it is not necessarily linked to marketing innovation; for instance, if the enterprise uses well-known marketing channels for well-known customers.

Strategies for opening up new markets could be implemented not only by new techniques to inform untapped potential customers, but also by new distribution channels. In a globalised economy the knowledge of local distributors is a key factor for opening new markets successfully. On the contrary, as the internet makes new distribution channels for direct marketing feasible even for small enterprises, intermediaries are not needed anymore. Therefore, new marketing strategies use multiple channels for sales and have to balance the interests of different participants such as retail seller and internet platforms (Yan et al. 2011). This implies efforts to establish close relationships with new partners for example in franchise systems or by licensing products. New arrangements for distribution involving new associates in the distribution of products create a link

to organisational innovation. Furthermore, product adaption to the local needs of customers abroad could lead to changes in product design or even the innovation of whole products. In a resource-based view of the firm the knowledge of partners, for example about product presentation in retail selling, adds missing competencies to the competitive position.

Next to activities for changing the communication with customers or using distribution channels new to the firm, the appeal of the product to the market could be changed by new designs for existing products or new pricing strategies. Changing the product design aims to improve the product form and appearance without changing the mere functional or user characteristics (European Commission/OECD 2005). Confronted with differentiated lifestyles of the customers, basic products need to be adapted to fit into that lifestyle. Not only the design has to be suitable for individualised customers, but also the product properties have to cope with customers, who demand the possibility to configure their products to their needs and willingness to pay. Additionally, modularised products can justify differentiated pricing: customers with a lower willingness to pay may choose less storage for their mobile phones or smaller engines for their car. This kind of innovation can be enabled by interactive internet platforms, where customers can individually choose their product variant, or by using different sales channels for different products (Wolk/Ebling 2010).

Innovative changes in design and pricing are closely intertwined with gathering information about the preferences of the customers and the ability of the sales channels and the production process to provide a differentiated product portfolio to the customers. Especially production processes are confronted with demands of differentiated markets; therefore a high flexibility combined with short lead time to the customer becomes an important correlate to marketing innovation. Marketing innovation refers to activities to improve the flow of information about products and customers, new distribution channels and changes in the design and pricing of a product. The important role of marketing to get new products to the customers has not changed, while at the same time globalised markets and individualised customers need to be served to maintain a competitive market position. The crisis of the established media, such as TV and newspapers, implies a crisis of established channels of marketing, whilst in the new media trends of advertisement and building customer relations change fast. Innovative marketing is more than new kinds of advertisement in the struggle for attention; it includes the organisation as a whole by changes in the structure and in the culture of an organisation.

To sum up, the contributions of marketing innovation to firms' competitive success can be summarised by the following three dimensions, similar to organisational innovation:

- Marketing innovation is a **distinct form of innovation** which directly affects firms' performance (Filippetti 2011; Srinivasan/Hanssens 2009; Rust et al. 2004; Hertenstein et al. 2005; Marsili/Salter 2006): As previous studies showed, firms focusing their attention on marketing activities are likely to increase their ability to correspond to customer needs and thus tend to obtain higher levels of customer satisfaction than competitors (Baker and Sinkula 1999; Schmidt/Rammer 2007) as well as higher business profitability when it relates to learning from external relations such as clients or competitors (Mothe/Thi 2010). For instance, the implementation of new sales and distribution methods can bring about

substantial improvements in a firm's efficiency and performance, because they are an important and direct information channel between firms and consumers (Lau et al. 2001) to identify and communicate customer needs and interests at a relatively low cost (Wyner 2000). Identically to organisational innovation, the characteristics of a firm's market and technological environment also influences the probability to introduce a marketing innovation (Schmidt/Rammer 2007).

- Marketing innovation as an **'amplifier' of other forms of innovation**: especially product and service innovation, but also technical and non-technical process innovation can be positively promoted by marketing innovation. In this role, marketing innovation can, on the one hand, help to supplement the superior characteristics of a new product or service by transferring and communicating them through corresponding packaging, design, pricing etc. and thereby enhancing their market success (Srinivasan/Hanssens 2009; O'Sullivan/Abela 2007; Walsh, 1996; von Stamm 2004; Verganti 2008; Filippetti 2011). Thereby, marketing innovation is also able to stimulate organisational innovation, for instance in terms of new organisational methods to include knowledge about customers' and markets' needs into product development processes at an earlier stage (e.g. simultaneous engineering, lead user integration). On the other hand, market innovation has also been found to enhance firms' product development capabilities in particular (Mothe/Thi 2010; Schubert 2010; Day 1994; Rust et al. 2004) as well as their innovation capabilities on the general level (Atuahene-Gima/Ko 2001; Slater/Narver 1995).
- Marketing innovation as a **prerequisite and source** for knowledge accumulation and organisational learning: as the successful implementation of a marketing innovation requires deep insight into the specific demands, attitudes, characteristics, norms and values of market and customer segments, previous studies, for instance, showed for product design activities that they represent an important internal source of knowledge generation and learning (Filippetti 2011; Verona/Ravasi 2003; von Stamm 2003a, 2003b). Analysing these aspects means gaining new knowledge about customers' or markets' specific preferences which, in turn, may trigger further innovation activities in the firm. It also represents the classical marketing argument that new products should always be developed on the basis of market research into customer needs (Levitt 1960, Kotler 2000). By 'getting it right' from the beginning of the innovation process it is possible to avoid the costs and delays of the numerous recycles that would otherwise be needed to produce a marketable product (Becker/Lillemark 2006; Kotler 2000; Wheelwright/Clark 1992).

As particularly pointed out by the second aspect, the benefits of marketing innovation for a firm's economic performance can also be explained by the market-based view of strategic management theory (Porter 1985, 1990). As this strand of theory explains firms' persistent competitive advantages by its "right" positioning in markets, marketing innovation can be regarded as the necessary link ("strategic fit" as Porter named it in his article "What is strategy" of 1996) between physical (technical) product characteristics and their non-technical features like design, image etc. In academic business literature, marketing innovation is therefore often closely aligned to the better-researched construct of market orientation, although the relationship between market orientation and marketing innovation is not yet fully explained (Augusto/Coelho 2009; Lukas/Ferrell

2000; Naidoo 2010). Generally, market orientation is defined as understanding and satisfying customers and other groups of relevant stakeholders (e.g. competitors, employees) (Day 1994, Narver/Slater 1990), which might be achieved by the “implementation of the marketing concept” (Kohli/Jaworski 1990). This suggests that marketing innovation plays an important moderating role between market characteristics and business performance, which means that different business contexts can be expected to lead to different marketing activities (Han et al. 1998; Kaynak/Kara 2004; Jaakkola et al. 2010). However, there are also studies which suggest no significant or ambiguous relationship between the two constructs of market orientation and marketing innovation (Diamantopoulos/Hart 1993; Jaworski/Kohli 1993).

2.4 The relationship between non-technological and technological innovation

The empirical evidence from previous studies shown above suggest that organisational innovation plays a crucial role alongside technological innovation in shaping firms’ innovativeness and competitive performance. However, the previous discussion alongside the theoretical framework has underlined how organisational and marketing innovations might differ in their origins, implementation and effects from technological product or process innovations. This raises the question whether and to what extent technological and non-technological innovations are complementarities or antipodes in firms’ innovation strategies.

On the one hand, despite - or even because - of their different terms of origin and outcome the two can have a complementary relationship. Reviewing the previous findings of the enabling role of organisational and marketing innovation for other types of technological innovation, technological and non-technological innovation might represent equivalent strategic options within firms’ innovation strategies to reach competitive advantage (Schmidt/Rammer 2007; Mothe/Thi 2010; Filippetti 2011; Evangelista/Vezzani 2010, 2011). For instance, Schubert (2010) found out that firms with higher levels of innovation resources tend to follow a broad innovation strategy which builds on the simultaneous use of technological innovation and organisational and marketing innovation.

With respect to organisational innovation, a close link to process innovation is likely, because the implementation of new technologies in manufacturing, logistics or distribution may demand reorganisation of business routines and working processes, which may in turn trigger the introduction of new business practices and new organisational models. Organisational innovation may also occur in the course of the development and market introduction of new products, for instance, when new products require the establishment of new production or sales divisions and call for re-organisation of work flows, knowledge management or external relations. Likewise, marketing innovations can be assumed to be closely connected to product innovation, since new products might demand the opening up of new marketing activities, changed pricing models, establishing new information channels to customers or adjusting the market communication with different stakeholders. In firms’ daily business, marketing and product innovation are likely to constitute a single innovation project, as both fields are seen as an integral, indivisible part of each

other. Additionally, new technical production technologies as well as new information and communication technologies are also likely to trigger marketing activities of firms, for instance by an increased product quality, lower costs, new functional features as well as the possibility to establish new ways of distribution, advertising or communication with customers.

When analysing the relationship between both fields of innovation, research can basically be grouped into approaches that looked at “complementarities in use” and “complementarities in performance” (Galia et al. 2012). Firstly, complementarities-in-use may arise from the fact that two sets of activities are linked in the sense that the use of one practice requires the use of other practices. In this case, there is a strong fit between practices, suggesting a mutual and beneficial interaction between different practices (e.g. Galia et al. 2012; Colombo et al. 2006; Galia/Legros 2004). Secondly, complementarities-in-performance explores the performance effects of the use of different practices in combination with one another. These studies offer a direct test of the economic value to the firm of fitting together different activities or practices and how the mutual product of the joint use of these practices produce economic benefits that are greater than the individual parts.

A range of studies have found complementarities-in-use between product and process innovation (Martínez-Ros/Labeaga 2009). These studies demonstrate that new products may require changes in processes in production and vice-versa. Looking at a sample of UK manufacturing firms, Reichstein and Salter (2006) found that the overlap between the two forms of innovation was greatest when the level of novelty of the innovations was high. Schmidt and Rammer (2007) show that the two forms of technological and non-technological innovations are linked to each other, although not systematically. In the second part of their analysis, they took the perspective of complementarities-in-performance and demonstrate that sales are higher for firms which combine product and process innovation with both marketing and organisational innovation.

On the other hand, however, Schubert (2010) also found evidence that the complementary relationship between technological and non-technological innovation is moderated by the firms’ market environment. Firms with a particularly weak or dominant position in the market tend to become pure marketing or organisational innovators, while firms with an intermediate market share are much more likely to have a broad innovation strategy consisting of both marketing and organisational as well as product and technical process innovation. Correspondingly to other studies (Caroli/van Reenen 2001; Greenan 2003; Piva/Vivarelli 2002), Schmidt and Rammer (2007) found out that just about the half of all innovating firms conducts both technological and non-technological innovation, while one third performs only non-technological innovation and one fifth only technological ones. This to some extent qualifies the mere complementary link between both fields of innovation and supports the assumption that under some circumstances, non-technological innovation types like organisational and marketing innovations might work as opposed strategic options for firms which cannot or do not want to undertake technological developments for several reasons.

Empirical studies supporting the evolutionary perspective of inter-firm heterogeneity (Arundel/Hollanders 2004; Leiponen/Drejer 2007; Srholec/Verspagen 2008; Som 2012) provide support for both strands of argumentation. Innovation patterns of firms might be primarily built on

technological as well as an non-technological innovation, and, of course, the combination of both. In the case of German non-R&D-performing firms, for instance, the findings presented by Som (2012) revealed types of innovation strategies that are mainly built on technological process innovation (“technical process-specialists”), non-technological innovation (“volume-flexible, specialised suppliers”) or both (“knowledge-intensive product innovators”).

However, the direction of the complementary link between technological and non-technological innovation is still not clearly answered by previous studies (Battisti/Stoneman 2010). Moreover, we still know little about the intensity of their relationship (Schmidt/Rammer 2007). How much technological or non-technological is necessary to stimulate respective activities in the other field? Last but not least, the periodical interplay between both types within the single firm is also not yet fully revealed.

Consistent with Galia et al. (2012), we would argue that the complementarities perspective is not itself a theory of organisational design or firm performance, because the analytical differentiation between technological and non-technological innovation appears somehow artificial against the background of business practice. Instead it rather represents a useful possibility for innovation researchers to understand relational phenomena between innovation activities and how the relationship between the parts of a system creates more value than its individual elements (Ennen/Richter 2010).

The question of complementarities between organisational and marketing innovation on behalf of non-technological innovation and technological innovation in terms of product and technical process innovation will be also explicitly considered by quantitative and qualitative empirical analysis in this report. In addition to the existing findings, the empirical investigation on the basis of EMS data will try to shed light on the complementarities between certain selected organisational concepts and other fields of innovation.

3 Market and systemic failures as barriers to innovation

Innovation activities of firms can, in general, be hampered by a number of factors. In consequence, they might be kept from innovating at all, face problems that slow down innovation activities or which cause negative effects on the expected outcomes. These factors include economic factors (e.g. high costs), factors located at the level of the firm (e.g. insufficient innovation management) as well as legal factors (e.g. regulations). Due to the benefits of innovation, including economic growth, an extensive debate about rationales for policy intervention can be traced back several decades (Arrow 1962). Public policies to promote innovation and technology development have been traditionally viewed as government interventions in activities which are primarily the responsibility of commercial firms operating in the market place. Such interventions are seen as requiring an overall rationale which can be seen as consisting of the following three elements (Barber 2009; Edquist 2011; Dreher 1997):

- Identification of some dimension of the economies innovation performance which is regarded as unsatisfactory or some future worthwhile objective or strategy whose achievement is threatened.
- Identification of a defect in the working of market forces or the functioning of the innovation system that seems likely to prevent the weakness in performance from being corrected or a worthwhile objective being realised at least within a reasonable timescale.
- Some form of public support or intervention which will eliminate or offset the defect at a cost which is expected to be less than the benefits thereby realised.

All of these elements must be present if a particular innovation policy can be justified ex-ante and be successful ex-post in attaining socially demanded goals. However, with respect to the first element, innovation policy objectives are usually formulated much more unspecifically, for example in terms of achieving increased economic growth, a better environmental balance, or increased inner security. Obviously, such objectives are not solely achieved by innovations, but partly by other means. This fuzziness often makes it difficult to decide whether there is a real underperformance with respect to a superior economic goal. This problem is aggravated by the complex and multidimensional character of organisational and marketing innovation which makes it difficult to isolate causalities between their use and a distinct performance output dimension or their distinct contribution to solving a societal challenge. Secondly, the condition of insufficient innovation intensity suggests the paradigm that more innovation is always better, but this is certainly not true. Especially in the case of marketing and organisational innovation, it cannot be taken for granted that higher innovation intensity implies persistent outperformance of competitors. On the one hand, organisational and marketing innovation, understood as new routines and processes, need some time until they become effective. Frequent changes in the organisational or marketing strategy of a firm might indicate a missing strategic master plan and will not be tolerated by employees and customers over time. On the other hand, from an evolutionary perspective, organisational or marketing innovations represent a firm's measures to adapt to the (changing) requirements of its environmental frame conditions. As long as these frameworks remain stable, it

might be reasonable for firms to stick to their existing processes and not to invest in non-technological innovation. Thus, the circumstance that we do not know how much innovation is “optimal” is certainly a dilemma for innovation policy which cannot be finally solved (Edquist 2011).

As argued by the strand of endogenous growth theory, policy interventions can be justified and legitimised by the public good character of certain goods. The most common reason for policy intervention thus lies in the area of natural public goods (e.g. air, water), as no one can be excluded from their use. In the context of innovation and technology policy, however, policy interventions mostly follow the rationale of the availability of technological or innovation-related knowledge (Dreher 1997).

The mere identification of a problem, however, is not a sufficient basis for the design of policy support. Thus, looking at the second element mentioned above, it is necessary to recognise the causes behind the underperformance. Knowing the reasons for underperformance then allows for deciding whether the problem could be solved by public policy support at all, and if so, which design of policy instruments might be the most appropriate one. For instance, problems of suboptimal innovation performance being located mainly inside the firm such as innovation mismanagement are difficult to address by public support, respectively are not supposed to be addressed by public policy support in order to maintain the functioning of market and competitive mechanisms. Hence, public policy support is bound to firm-external problems in terms of securing market or systemic frameworks that favour and support innovation activities within the innovation system.

The authors are fully aware of the circumstance that an explorative approach based on qualitative case studies can provide only first hints and indications on the specific external barriers and obstacles for organisational and marketing innovation (see chapter 5). However, to avoid our case study analysis resulting in a mere arbitrary, random set of dimensions to be addressed in the interviews, we decided to root it in the most prominent and common heuristics for analysing innovation barriers in order to derive guiding aspects and dimensions and to build the qualitative analysis on a solid conceptual ground. These heuristics are represented by the concepts of market and systemic failures which will be elaborated in more detail in the following section.

3.1 The neoclassical rationale for public intervention in science, technology and innovation policy

In the production function models of neoclassical economic growth models (Abramovitz 1956; Salter 1960; Solow 1956), technology as the main driver of economic growth was taken as an exogenous “factor”, which means that it was taken as given without questioning its origin. This exogenous character of technological change caused another serious problem, namely the characterisation of technological knowledge as a public good in terms of codified knowledge which is publically available in a perfectly usable form. The scientific and technological knowledge can thus be easily transmitted and instantly diffused between different actors. Under this condition of the global availability of knowledge (e.g. through patent databases) firms are considered to have

equal capabilities to incorporate the same technologies into production at negligible costs. In addition, any two firms facing technology-information alternatives will rationally choose the same alternative that maximizes their expected return (Laranja et al. 2008). However, the exogenous growth models showed only limited power in explaining total increases in economies' output. Thus, economists started to realise that technological progress could not be treated as a residual factor outside the economic system. Taking technology as an endogenous factor, (Arrow 1962) stated that the process of producing and using technological knowledge generates positive spillover as a result of indivisibilities in inputs and outputs, uncertainty, and low appropriability and excludability. Due to the public good characteristics of technological knowledge and the difficulties and uncertainties in appropriating returns from innovation, firms face disincentives to invest in technology and would, therefore, produce a sub-optimal level of innovation, resulting in market failure.

Typical policies associated with the market failure rationale are those directed at compensating for market failures in the less than optimal allocation of private resources to science and to communication and those oriented towards diffusion and transfer of technology information. Market failures in the neoclassical understanding are deviations from the ('Pareto-') optimal allocation of the resources caused by the imperfectness of the analysed markets. Therefore policy support aims to support innovation by reducing the inefficiency caused by the following types of market failures (Barber 2009; Gustafsson/Autio 2011; Dreher 1997):

- **Externalities** occur where agents do not enjoy all of the benefits or incur all of the costs of their actions. If economic agents cannot ensure that their expenses for getting an invention into the market are compensated by extra profits, they may reduce their innovative efforts (Granstrand 2005). Without patents and registered designs trying to guarantee these profits, enterprises are likely to react with reduced innovation activities.
- **Public goods** where the consumption or use of a good or service by one agent does not exclude its use or consumption by another. Knowledge created and required in the course of the innovation process can be considered to be a public good insofar as it is not covered by patents or other strategies of protection of intellectual properties. For example employee turnover speeds up the diffusion of innovations but diminishes the returns for innovative enterprises.
- **Uncertainty** or information asymmetry where agents cannot know in advance what the outcomes of their actions are likely to be. By starting the development of a new product the demand is unknown and the technological success cannot be ensured. Additionally innovation may include close collaborations between enterprises (e.g. the exchange of information beyond contracts). Like all agents in the innovation system, investors suffer from limited information and bounded rationality and the consequences of their actions will be similarly uncertain. Unfamiliar investments (e.g. in novel technologies, innovative business models or marketing methods) will appear too risky in relation to the anticipated returns as will some longer term investments (e.g. R&D).

- **Economics of scale** or market power where the unit costs of an activity continue to decrease as the scale of the activity increases. This can result in monopoly and barriers to potential new entrants to a sector or market.

Thus, following the neoclassical rationale, policy intervention on the one hand aims at the provision of incentives for private innovation through direct (e.g. programmes) or indirect (e.g. tax incentives) subsidy, the protection of intellectual property rights, as well as through the direct provision of infrastructure producing technology-information which would otherwise not be produced. On the other hand, policy support in the neoclassical thinking can aim at the establishment of mechanisms to promote the diffusion of codified technological knowledge.

From the neoclassical perspective, policy does not need to pay attention to spatial issues. Because of rational maximisation and equal access to technological knowledge, a unit of expenditure in technology would create the same expected marginal value no matter where it occurs, and therefore, space and location are irrelevant. Economic growth takes place in a somehow 'neutral' space (Boschma/Frenken 2006), with no regard to preconditions or specific contexts. Moreover, neoclassical equilibrium economics based on perfect competition and constant returns to scale would assume that, provided there are no barriers to the working of market forces, natural market mechanisms will gradually eliminate any economic disparities between and within nations. To conclude, the neoclassical view sees the policy maker primarily in the role optimising social collective benefits (Metcalf/Georghiou 1998).

Building on the contribution of Arrow, the so-called endogenous growth theories (Lucas 1988; Romer 1990) relaxed the neoclassical assumptions of perfect competition and constant or decreasing returns to scale. Endogenous growth theories understand innovation as the result of learning by doing and investment in R&D. R&D and learning results are no longer regarded as freely available knowledge, being non-rival and non-excludable and hence difficult to appropriate fully (Laranja et al. 2008; Som 2012). Making technology an endogenous factor allows for increasing returns to investment in R&D (Romer 1994), and therefore, incentives to innovation are taken to be the potential monopolistic gains from R&D investment (Scherer 1965). However, due to knowledge spillover, firms are not able to realise the full rate of return on their innovation activities (Geroski 1995). Localised spillover from relevant knowledge sources may occur because close proximity facilitates communication and learning. This perspective also implies that knowledge is not diffused instantly and freely but rather needs to be acquired (Langlois/Robertson 1996), and that this may be dependent on the R&D capability of the recipients (Cohen/Levinthal 1989, 1990). In consequence, private R&D activity is undersupplied relative to the social optimum. Similar to the neoclassical market failures, policy intervention thus ought to address this appropriability problem by subsidising or encouraging private R&D to promote social welfare. The emphasis is again on promoting the supply of scientific and technical knowledge and information but there is potentially a broader role for policy implied in the move away from simply correcting failures towards a more positive promotion of R&D and the formation of highly qualified 'human capital' (Laranja et al. 2008).

One major difference compared to the traditional models, however, is that this rationale tends to result in stronger support for regions with greater concentration of knowledge and R&D resources.

As a result, regional disparities are likely to increase over time, because targeting knowledge generation and R&D resources in these regions will maximise the effect of increasing returns. This policy rationale of increasing returns is likely to result in greater spatial concentration of R&D efforts and increased inter-regional disparities.

These concepts of market failure have been developed to describe failures in the abstract neoclassical concept of markets, but they became increasingly unsatisfactory (Barber 2009) as a basis for rationales for policy support. While traditional arguments by neoclassical economists tend to focus on the market failures mentioned above, which result from underinvestment in science and technology because of inherent characteristics of scientific knowledge (uncertainty, inappropriability and indivisibility), modern, systemic and evolutionary approaches tend to justify public intervention by drawing attention to systemic failures (Lundvall 1992; Edquist 1997).

3.2 The systemic rationale for public intervention in science, technology and innovation policy

The systemic view on policy rationales is connected with the broadening of the innovation concept and the shift of the analytical focus towards innovation activities that go beyond the scope of science and technology. Research into innovation processes revealed that firms that are embedded in social systems of innovation (Lundvall 1992; Edquist 1997; Nelson 1993). Firms usually do not innovate in isolation but in collaboration and interdependence with other organisations (e.g. suppliers, customers, competitors), non-profit entities (e.g. universities, schools, government), institutions (e.g. laws, rules, norms), and other social stakeholders (e.g. local residents, interest groups). In doing so, firms intentionally make use of their surrounding external sources in terms of collaboration (Dyer/Singh 1998; Nooteboom 1999), user-driven innovation (e.g. Lundvall 1985; von Hippel 2004), or “open innovation” (e.g. Chesbrough 2003).

As discussed above, the core issue of the systemic, evolutionary approach to innovation and economic growth is that innovation knowledge is taken as a mix of tacit and explicit information that cannot be simply reduced to single pieces which are ready-to-use (Laranja et al. 2008). Therefore, particular attention is paid to all kinds of learning and cognitive capacities of different public and private actors (Nooteboom 2009). This cognitive capacity is thereby not reduced to only scientific and technical knowledge, but also to other kinds of knowledge, related to markets or produced in business and organisational practices. It also includes dynamic aspects related to the capacity to change the cognitive capacity, involving changing the “way of thinking”, the beliefs, the visions, the intangible resources and organisational routines, etc. Innovation and growth are thus seen as the result of collective, cumulative, path and context-dependent processes, varying in terms of heterogeneous behavioural patterns across different actors, being the driver of economic change (Nelson/Winter 1982), and rejecting the idea of a ‘representative’ firm (Metcalf 1995).

Against the backdrop of this study, the mere view on market failures thus does not provide any sufficient analytical framework for organisational and marketing innovation understood as complex and open social systems. Instead, in the context of organisational and marketing innovation it is

necessary to extend the neoclassical concept of market failures to aspects of the innovation systems' mechanisms from an evolutionary perspective: dynamic nature of the economic system in terms of ongoing variation and selection, the associated irreversibility and path dependency of economic actions, the uncertain and complex nature of economic processes, the heterogeneity of actors in the system, and their interaction and interrelationships. Referring to the underlying systemic approach to innovation, innovation barriers related to these aspects were named as 'systemic' or 'system failures'. Morris Teubal (1998: 156) defines a system failure as the "failure to stimulate in a timely fashion the emergence of a new component of a NSI [national system of innovation] which is deemed to be of strategic value for the economy. More generally, system failures reflect deficiencies in the set of complex activities which should be undertaken both by the policy mechanism of a country and by market forces in order to stimulate such a NSI component." Following this conceptualisation, academic researchers as well as innovation policy-makers conducting empirical analyses of the problems encountered by innovating firms suggest the existence of the following failures and innovation barriers which are *additional* to the neoclassical concept of market failure (Gustafsson/Autio 2011; Barber 2009; Laranja et al. 2008; Woolthuis et al. 2005; OECD 2005; Malerba 2005):

- **Infrastructural failures:** To succeed in generating innovation, firms need a reliable infrastructure to enable their operations and processes, and to support their long-term developments. In particular, a functioning knowledge infrastructure (e.g. availability of scientific and applied knowledge skills, testing facilities, possibilities for knowledge transfer, patents, training, education, etc.) and a high-quality ICT infrastructure (e.g. broadband, telephone, energy supply, etc.) are emphasised in this context (Smith 1999; Edquist et al. 1998).
- **Institutional failures:** Due to its complex nature, much knowledge is transitioned rather across networks than bought and sold in markets. The innovation systems approach explains innovation patterns in terms of knowledge-flows mediated by institutions, which are taken as focusing devices for accumulation of knowledge types along technological trajectories (Lundvall 1992, Edquist 1997). However, there is little consensus in literature as to how to frame and define different forms of institutional failure (Woolthuis et al. 2005). Some authors differentiate between 'hard and soft institutional failure' (Carlsson/Jacobsson 1997) or 'consciously created and spontaneously evolved institutions', while others refer to "formal and informal institutions" (Johnson/Gregersen 1994). Nevertheless, there is consensus that 'hard' institutions represent the formal, written, consciously created institutions, and 'soft' institutions which are informal, represent the implicit 'rules of the game' (Woolthuis et al. 2005). In this sense, hard institutional failures refer to formal institutional mechanisms that might act as barriers to innovation, consisting for instance of standards, health and safety regulations, labour law, as well as the general legal system relating to contracts, employment or IPR within which the

economic and non-economic actors operate (Smith 1999)¹. In contrast, soft institutional failures have their origin in the wider political and social values and culture which shape public policy objectives, the macroeconomic policy environment and the way ‘things are done’. According to Saxenian (1994), Carlsson and Jacobsson (1997) and Fukuyama (1995), soft failures which might hinder innovation activities include, for instance the lacking willingness to share resources with other actors, the lacking entrepreneurial spirit within organisations, the degree of mutual trust or risk averseness.

- **Interaction/network failure:** In contrast to neoclassical models, systems approaches to innovation reject the idea of atomic, ‘one-shot-buyers and sellers’ (Woolthuis et al. 2005: 613). Instead, as market relationships evolve and persist through time (Smith 1999), the links, interactions and collaborative relationships between the different actors within the innovation system (e.g. other firms, suppliers, customers, users, government, public research organisations, non-profit organisations, service providers, etc.) are of high relevance. Such interactions like cooperation between firms and other actors take time, effort and resources and may be far from being optimal, not least because of insufficient information about possible useful partners. The existence of appropriate networks and platforms is therefore a key element in the successful operation of an innovation system. From the systemic perspective, interaction failures can have their origin either in too much or too little interaction (Woolthuis et al. 2005) which can both hamper innovation activities. Carlsson and Jacobsson (1997) distinguish between weak and strong network failures. Strong network failures refer to the risk that highly intensive cooperative relationships between actors can develop a certain degree of closure, which can lead to myopia and inertia (Bogenrieder/Nooteboom 2002, Nooteboom 2009). As a result, insufficient attention is paid to developments outside the collaboration and the firms inside the network may be locked-in to existing (technological) trajectories or paths. Hence, it is important for networks to have a sufficient amount of ‘weak ties’ (Granovetter 1983) in terms of actors serving as bridge-heads and links to new external impulses and knowledge. However, besides the problem of knowledge inertia, lock-in effects can also occur in terms of dependencies on dominant network partners. Actors may be locked into their relationships due to asset specificity, switching costs or because of a lack of alternative partners (Woolthuis et al. 2005, Williamson 1985). Finally, with successful innovation being the result of close interaction between complementary technologies and actors, a poor connectivity among these elements may prevent firms from innovating. As a result of such

¹ Certainly, the interpretation of institutional features and norms like health and safety norms can be highly questioned. Nevertheless, from the mere analytical perspective they restrain the scope of possible innovation activities by firms and thus are working as barriers in the proper meaning of the word. In the context of our case study analysis, however, this kind of “innovation barrier” will not be taken into account as we strongly believe that they are likely to produce a desirable economic and social outcome. Moreover, this aspect points to the general and yet unsolved question on which level of aggregation (firm, innovation system, economy, society) barriers, obstacles and failures should be conceived and measured.

weak network failures, possibilities for interactive learning and innovation are under-utilised and firms may fail to adapt to new technological developments. (Carlsson/Jacobsson, 1997).

- **Structural inertia:** Besides the problem of network or system-level inertia mentioned previously, there is also an internal dimension of structural inertia within organisations (Gustafsson/Autio 2011) in the sense that firms fail to learn about, or take stock of emerging technological or business opportunities (Malerba/Orsenigo 1996). The actions of firms today determine the nature of the options open to them tomorrow. The resulting path dependency is the combined result of the ex-post irreversibility of investment in capital assets, the externalities generated in the technological locality of the particular path the firm has chosen to follow, and the feedback benefits such as those generated by learning-by-doing. As organisations evolve over time, they develop increasingly entrenched information filters, communication channels, and problem-solving strategies (Nelson/Winter 1982). At worst, such path dependency could give rise to structural inertia (Hannan/Freeman 1984) and increasingly inflexible management models (Lundvall 1988; Tripsas/Gavetti 2000). This structural inertia leads to the lock-in of firms to a particular combination of technology and business model so that they feel unable to adopt a new superior technology, which, in the end, hinders organisational-level adaptation to rapid environmental change (Sydow et al. 2009; Schreyögg et al. 2010).
- **Capability failure due to the complex and intangible character of knowledge:** While neoclassical theory treats all information as codified, disembodied and easy to understand, evolutionary systemic approaches stress that information only becomes useful when it has been absorbed into the knowledge base of firms. This absorption is a process which takes time and effort. Much knowledge is tacit and can only be acquired either as a result of learning by doing or in close proximity with those who already possess it (Nooteboom 2009). This asymmetry of knowledge between different firms may lead to non-optimal outcomes. But even if a firm can access the necessary resources through collaboration, the partner will only provide access to the resources or knowledge needed if the firm has something to “pay back”. Therefore, the individual strength and development potential of firms is of crucial importance. Smith (1999) found out that firms often have problems adapting themselves to new technologies, markets or business models, because “firms almost always concentrate on what they know best: they focus on products and technologies where they have experience and skills” (Smith 1999: 43). Although this specialised focus enables them to perform their everyday business, it can seriously hinder the firm’s development if the required capabilities to adapt to environmental changes are located outside its existing capabilities. Due to the frequently tacit nature of innovation knowledge and its high embeddedness in organisational structures which are hard to imitate, new market entrants might face difficulties in appropriating the necessary knowledge. Hence, knowledge as well as other intangible assets can also provide very effective barriers to market entry or market survival (Barber 2009).

While the concept of market failure primarily relies on malfunction in factor markets, systemic failures enlarge this perspective by considering malfunction in the key mechanisms of the

innovation system. Thereby, it is obvious that the concepts of market and systemic failures should not be seen as contradicting each other in terms of a dichotomy. For instance, aspects of capital market failure as well as the partial public good character of explicit knowledge and the resulting externalities problem are also recognised by systemic approaches (Malerba 2005, Barber 2009). Following the suggestion of Edquist (2011) this study understands both market and systemic failures as firm-external factors that **negatively influence the propensity** of firms to perform innovation activities or innovation projects in the field of organisational and marketing innovation and which are independent from the individual characteristic of the single firm.

As pointed out earlier, the attempt to extend the theoretical reasoning and empirical exploration of market and system failures to organisational and marketing innovation in the sense of a broadly empirical evidence, which could serve as a sufficient basis for policy-making, is certainly limited by the temporal and financial restrictions underlying this study. Nevertheless, because previous studies dealing with this issue are not available, both concepts of market and system failure provide valuable guidance. Given these restrictions, this study tackles the issue of market and system failure in a softer way by shifting the emphasis on the pioneer exploration of external barriers and obstacles for organisational and marketing innovation.

3.3 Eight working theses on how organisational and marketing innovation might be related to market and systemic failures

Regarding the general impact of market or systemic failures on all innovation activities of firms, the first INNO-Grips work package study conducted by Reinstaller et al. (2010) has impressively confirmed the existence of innovation barriers perceived by firms (table 1). Most frequently, firms' innovation activities are constrained by lacks of financial resources and qualified personnel, which both refer to the perspective of market failures with regard to factor markets. Other barriers are perceived in the restraining role of regulations and standards as well as the lack of information on technology and markets. These types of barriers refer to the concept of systemic failures in terms of institutional and interaction failures. The differentiation between R&D innovators and non-technological innovators in their study shows that non-technological innovators are similarly affected by innovation barriers than their R&D-driven counterparts, whereby the lack of information on technology and regulations and standards seems to play a slightly more important role as hampering factors.

However, the indicators available in CIS data unfortunately do not distinguish between different types of innovation. Hence, it cannot be resolved on this basis regarding which type of innovation the mentioned barriers do refer to. First, as most firms intuitively think about product or technical process innovation, it can be assumed that these barriers are primarily related to these dimensions. Secondly, even the differentiation between R&D innovators and non-technological innovators does not resolve this problem. For instance, it cannot be excluded that the status of being a non-technological innovator is particularly rooted in the prevalence of the mentioned barriers hampering them in successful technological innovation.

Table 1: Importance of selected barriers to innovation for all firms and innovators across country groups (Reinstaller et al. 2010)

	All countries	Country Group 1	Country Group 2	Country Group 3	Country Group 4
<i>All firms</i>					
lack of financial sources	25.5%	24.5%	23.5%	27.6%	37.0%
lack of qualified personnel	26.6%	27.6%	15.6%	25.4%	20.0%
lack of information on technology	14.2%	12.5%	9.2%	18.4%	17.7%
lack of information on markets	14.7%	13.6%	11.6%	17.2%	19.0%
lack of flexibility of standards and regulations	18.1%	18.2%	10.2%	18.6%	19.4%
<i>R&D innovators</i>					
lack of financial sources	30.6%	29.1%	38.3%	36.6%	35.8%
lack of qualified personnel	34.1%	34.2%	29.4%	34.5%	17.2%
lack of information on technology	15.8%	13.7%	18.0%	25.2%	16.9%
lack of information on markets	18.1%	16.5%	23.4%	24.9%	21.2%
lack of flexibility of standards and regulations	19.8%	18.8%	13.9%	25.1%	18.9%
<i>Non-technological innovators</i>					
lack of financial sources	27.9%	26.9%	25.9%	29.8%	36.7%
lack of qualified personnel	31.5%	33.4%	16.0%	28.7%	18.0%
lack of information on technology	16.7%	15.2%	9.5%	20.2%	16.0%
lack of information on markets	16.2%	15.3%	12.3%	18.3%	17.3%
lack of flexibility of standards and regulations	22.3%	23.7%	12.6%	19.9%	19.0%

Source: CIS-2006 data accessed at the Eurostat safe centre – WIFO calculations;

Remark: Barriers are measured as binary variable. The variable takes the value of 1 if the degree of importance is judged to be medium or high. If the degree of importance is judge to be low or not relevant the variable gets the value 0.

Country group 1: Belgium, Denmark, Germany, Finland, France, Iceland, Luxembourg, Norway, Sweden; Country group 2: Czech Republic, Estonia, Hungary, Slovenia, Slovak Republic, Ireland; Country group 3: Spain, Italy, Portugal, Greece; Country group 4: Bulgaria, Lithuania, Latvia, Romania, Cyprus, Malta

Thirdly, because of their different origins within the enterprise and their specific characteristics, organisational and marketing innovation might be especially affected by institutional, interactive or structural inertia, like, for instance, organisational rigidities (e.g. negative attitudes towards change within the firm), deficiencies in the availability of relevant knowledge (e.g. about adequate organisational concepts, customers' preferences and life-styles) or legislation, regulations, and standardisation issues. Hence, on the one hand, it would be interesting to see whether organisational and marketing innovations are similarly affected by innovation barriers as technological, R&D-based product and process innovation. As underlined by the previous theoretical discussion, technological and non-technological fields of innovation should by no means be understood as being isolated from each other. Instead, they frequently represent complementary dimensions of firms' innovation strategies (Evangelista/Vezzani 2010, 2011; Schubert 2010; Battisti/Stoneman 2010). Thus, it can be assumed that the set of barriers and obstacles which causes firms to perform innovation activities at a suboptimal level might equally affect technological and non-technological fields of innovation. On the other hand, special attention should be paid to the question, whether and in which dimensions organisational and marketing innovations might perhaps be differently affected by particular aspects of systemic and market failures. Such differences could be their specific contexts of origin both within the firm and in networks of private and public actors.

For these reasons, the authors of this study suggest not using quantitative CIS data to assess the question whether and to what extent organisational and marketing innovation might be affected by market or systemic related barriers. Instead we analyse this question more deeply by using qualitative data from firm interviews, allowing for a more detailed understanding of the relevant barriers in the light of the firms' embeddedness in the innovation system. As the Oslo Manual states "case studies alone can cast light on some important features of organisational change" (European Commission/OECD 2005: 43), because they make possible an analysis of contemporary phenomena within a real context and allow for considering many variables (Barañano 2003). Additionally, the mere presence of innovation barriers and obstacles says only little about the causes behind them. Especially this point, however, is crucial when it comes to the identification and design of corresponding policy instruments (Edquist 2011). Therefore, this study chooses an explorative case study design.

However, to make the theoretical constructs applicable for the explorative case studies, it is necessary to integrate the previously discussed theoretical perspectives of organisational and marketing innovation on the one hand, and market and systemic barriers, on the other hand. To the best of our knowledge, this problem has not yet been addressed by any previous study. Therefore, we would suggest integrating both theoretical perspectives by sketching some explorative **working theses (WT)** on how organisational and marketing innovation might be related to market and systemic barriers and obstacles.

Firstly, the working theses serve the purpose of applying the rather abstract concept of market and systemic barriers to organisational and marketing innovation, and of highlighting some concrete aspects of how innovation activities in these fields could be constrained in business practice. Secondly, the working theses are by no means exhaustive. Instead, they are supposed to provide some points of reference for the development of the interview guidelines for the firms' case and policy interviews as well as when it comes to the interpretation of the quantitative and qualitative findings at the end of this report. Therefore, the working theses might be supplemented or attenuated on the basis of the empirical results and can thereby also serve as a starting point for further in-depth studies in this field.

Before we start with the formulation of the working theses, it should be pointed out that the aspect of incomplete information/bounded rationality should not be taken into account separately as a systemic barrier, because it represents one of the basic premises for the generation of variation within evolutionary theory. Hence the reasoning that the innovation activities of firms are restrained by their incomplete information would result either in tautology or neglect this circumstance as one of the basic evolutionary mechanisms.

Firstly, according to the evolutionary framework, knowledge is one of the most crucial resources for successful innovation. However, as described above, knowledge needs to be partially considered as a **public good**, as its use does not exclude the use or consumption by another actor and it cannot be revealed prior to sale without giving it away. More specifically, while the patent system represents a highly institutionalised form of knowledge protection in the case of technological innovation to ensure that firms can appropriate the returns and benefits of their innovation expenditures, this is not the case for organisational and marketing innovation. For

marketing innovation, alternative elements of the IPR system such as copyright or trademark protection only partially address this issue of externality, because innovative ideas in the fields of product design as well as pricing or promotion of products can relatively easily and in a short time be taken up by imitators. Thus, the economic profit of the innovator remains limited or is soon enjoyed by others, too. This problem is even more severe, as marketing innovations become fully visible on the market. This leads to working thesis 1.1:

***WT 1.1:** Marketing innovations, such as innovations in product design, product distribution or pricing might be more strongly affected by the lower effectiveness of intellectual property rights (IPR) than technological innovation.*

Regarding organisational innovation, there are two possible theses that can be put forward. On the one hand, similarly to marketing innovation there are almost no protection rights for organisational innovations at the moment. New organisational structures or processes thereby also have the character of a public good, which means that their use by a firm does not exclude their use by other firms. Moreover, there are vast amounts of books on management and organisational design where certain organisational concepts and their implementation are described in extensive detail. In particular, there might even be an advantage for innovation followers compared to innovation leaders, as the late comers might profit from the experiences of the “pioneers” with new organisational practices and copying their processes of implementation. This leads to working thesis 1.2:

***WT 1.2:** Due to their knowledge intensity and public availability of this knowledge, organisational innovations might be comparably affected by low effectiveness of IPR as technological innovations.*

On the other hand, as stressed in the evolutionary framework and resource-based approaches of strategic management, organisational innovations are understood as intangible assets of firms which can hardly be imitated or transferred to other firms because of their highly specific character and their embeddedness in the social and cultural system of the respective enterprise. Furthermore, as new organisational routines and structures need a certain period of time to become internalised and routinised, firms who have implemented an organisational innovation earlier might obtain higher benefits from them compared to “latecomers”. This paves the way for working thesis 1.3:

***WT 1.3:** Due to their intangible, complex, and firm-specific nature, organisational innovations are affected by the externalities to a lower extent than technological innovations.*

The second aspect relates to both a firm-internal **capability failure** and a “**hard**” **institutional barrier** on the system level. Going back to the past, the recognition of R&D as an important internal driver of firms’ innovativeness did not arise until the emergence of large companies and their increased internal division of labour at the beginning of the industrial revolution (Dodgson et al. 2008). While innovation activities were so far happening mainly outside the firm, they were

transferred, institutionalised and systematised within the enterprises. Thus, innovation was thus no longer left to randomly distributed entrepreneurial genius. Since then, professional education, the establishment of laboratories and improvements in techniques of measurement and experimentation have progressively increased the efficiency and controllability of discovery, invention, and innovation (Mowery/Rosenberg 1989). By the first decade of the twentieth century, the focus of inventive effort was shifting from the contract laboratory to the in-house industrial R&D departments established by companies like Kodak, General Electric or Du Pont (Freeman/Soete 1997). Even if inventor-entrepreneurs were involved or played a key role in the innovative process, such individuals were usually scientists or engineers who had the facilities and resources to conduct sustained R&D work. Subsequent to the establishment of industrial R&D departments, the nature of R&D activities developed differently, based on functional specialisation and division of labour (Pavitt 2001). Freeman and Soete (2009) emphasise that exactly these developments constituted a new scale and extent of professional specialisation, because a much greater part of technological progress appeared attributable to R&D activities performed in specialised laboratories, departments or pilot plants by full-time qualified staff. More clearly, R&D statistics are really a measure of the professionalisation of this activity, the professional recognition of R&D activities as a separate activity within firms or of whole organisations carried out by professional researchers (Freeman/Soete 2009).

In contrast, organisational and marketing innovation activities are often considerably less institutionalised and professionalised within firms. Particularly in SMEs, these activities are often recognised as part of the daily management or selling business lacking specifically devoted financial or human resources (Som/Zanker 2011). In consequence, it can be assumed that the level of professionalisation and knowledge accumulation of firms is much less developed for organisational and marketing innovation compared to technological innovation. In consequence, important knowledge and information of how to develop and implement organisational and marketing innovation is likely to be located outside the firm. For this reason, many firms might face a higher need to successfully recognise, select and adopt external knowledge about organisational structuring concepts and marketing methods as they are not able to realise their implementation by themselves.

Following the point made by Cohen and Levinthal (1989, 1990) that institutionalised R&D activities of firms increase their technological absorptive capacity, it could similarly be assumed that the lower degree of institutionalised and professionalised processes results in a lower absorptive capacity of firms in the fields of organisational and marketing innovation. Thus another working thesis referring to a firm-internal **capability barrier** can be formulated:

WT 2.1: Due to the lower firm-internal institutionalisation and professionalisation of knowledge-accumulating processes, firms might suffer from a lower absorptive capacity of external knowledge and information necessary to successfully undertake organisational and marketing innovation compared to technological innovation.

Moreover, in contrast to technological innovation and the patent system, there is no institutional vehicle to promote systematic knowledge flows and diffusion of organisational and marketing

solutions between different actors. As pointed out by Arnold (1997) or Burr et al. (2007), patents also have an information function besides their protective function, because the patent certificate compulsorily contains a detailed description of the invention. The knowledge which is inherently immanent in each new product or new manufacturing process is contained in the patent and published through the patent specification which can be freely assessed by others, which accelerates knowledge diffusion and counteracts the principle of exclusivity. This leads to another working thesis addressing a possible institutional failure on the systemic level:

WT 2.2: The absence of an institutionalised mechanism to ensure knowledge diffusion about new organisational or marketing concepts might prevent firms' early recognition of existing solutions and thereby cause inefficient and suboptimal innovation activities compared to technological innovation.

Thirdly, due to a missing institutionalised framework for systematic knowledge spillovers on the one hand, and the complex and firm-specific nature of innovation knowledge about organisational and marketing innovation on the other hand, much information and knowledge in these fields are transmitted rather across social networks than bought and sold on markets (Cassiman/Veugelers 2002; Belderbos et al. 2004). Thus, a necessary precondition for absorbing external knowledge for innovation is that relevant knowledge can be easily recognised and accessed via appropriate and functioning networks with external partners. As many forms of organisational and marketing innovation aim at the improvement or renewal of relationships, interfaces or linkages with internal and external partner and customers, with regards to the establishment of new networks and sales markets, they are likely to take place in close collaboration and interdependence of different actors (e.g. universities, schools, government ministries, suppliers, customers, competitors, etc.). However, this requires access to these groups in terms of properly functioning networks. Not being embedded in networks may cause firms to lack considerable knowledge about markets, but also to be unable to realise new organisational collaboration routines with external partners.

However, due to the complex and highly firm-specific, intangible nature of organisational and marketing innovation knowledge and competences, firms run the risk of being trapped within networks of partners that are facing similar environmental challenges or that are characterised by similar organisational structures resulting in high network conformity. This may be aggravated even by the circumstance that particularly organisational innovation often follows the intention of improving operational linkages and interfaces along the value chain, for instance in terms of sharing risks and costs (Das/Teng 2000), increasing market power (Martin 1994; Greenlee/Cassiman 1999; Hamel 1991) or dealing with industry standards and government policies (Nakamura 2003). As outlined above, such highly intensive collaboration structures might run the risk of being locked-in in the specific perspectives of the participating network partners due to the ongoing, self-reproducing interaction and exchange of pre-filtered information as well as biased perception and interpretation patterns of the network environment. Moreover, particularly in the case of specific industries (e.g. the automotive industry) which are characterized by high interdependencies between OEMs and their suppliers, this problem could become even more severe, all the more as many OEMs even frequently prescribe collaboration constellations between

their suppliers. Hence, systemic obstacles in terms of an **interaction or network failure** might occur. Although on the basis of this argumentation it might be assumed that this issue particularly accounts for organisational and marketing innovation, there are similar risks in the case of technological types of innovation. Nevertheless, another working thesis can be formulated:

***WT 3:** As organisational and marketing innovation strongly refer to network and market constellations and are performed in close interaction with external partners, they might be affected by barriers related to interaction or network.*

Following the previous argumentation, the **fourth** working thesis refers to the problem of **structural inertia** on the firm-level. Firms might be facing inertia or “lock-in-effects” into a particular strand of technology and business strategy so that they are unable to freely choose new and superior technologies or business models. Similar to technological solutions, however, organisational and marketing innovations also involve the danger of inherent structural inertia. Both types of innovation constitute processes and orientations that determine future actions and decisions. For instance, an organisational structure cannot be changed overnight from a Tayloristic work organisation to a participative work organisation, with job enrichment and flat hierarchy levels, because Tayloristic work organisation itself is not likely to stimulate such a change within its mechanistic patterns of action. Likewise, the established image and placement of a product within a certain community of customers, for instance, conservative, value-oriented families cannot be transformed to a hip life-style label for singles in the short run. Thus, the following working thesis can be formulated:

***WT 4:** Due to their complex and systemic nature, organisational as well as marketing innovations can be hampered by structural inertia.*

Further, it can be assumed that the impact of structural inertia on both types of innovation can be moderated by **soft institutional barriers** in terms of socio-cultural factors such as the resistance to change, either within the organisation (e.g. employees or management), or at the general level of the society (e.g. customers, consumers, political actors).

The fifth aspect of obstacles refers to the point that knowledge (e.g. about the preferences of customers) and intangible assets (e.g. highly efficient processes and routines between collaboration partners) embodied in organisational and marketing innovation could itself create significant barriers to market entry for new competitors. With regards to organisational innovation, for instance, the automotive industry has evolved specific organisational concepts over time (e.g. LEAN-production and management, Toyota-manufacturing systems, Total Quality Management). Some of them have even made their way into standardised methods and instruments that are part of, for example, quality-related norms like ISO900x, which have to be fulfilled by market entrants before they can enter competition. Additionally, organisational innovation activities by firms can itself be constrained by **institutional barriers** in terms of regulation frameworks (e.g. employment law) and guidelines (e.g. occupational safety). For instance, in order to increase the flexibility of their work organisation, some Chinese firms have started to equip workbenches with rollers so that

they can be flexibly moved around (Stowasser 2012). However, this solution might certainly be incompatible with working safety guidelines in other countries. In consequence, the following working thesis can be formulated:

***WT 5.1:** Organisational innovations are affected by market entry barriers in terms of existing legal framework, standardisation, and regulation.*

Looking at marketing innovation activities, they might also be subject to market entry-barriers, because they are affected by existing strong trademarks (e.g. IKEA), well-established product images (e.g. Mercedes Benz' "S-Klasse"), dominant product designs (e.g. Apple's iPod, iPad or iPhone) as well as 'public brandings' where a trademark and a product genre are equated in the perception of the customers (e.g. "Coca Cola", "Tempo"). Likewise to organisational norms, the protection of trademarks and copyrights at the regulatory level provides another, at least partial strategy for erecting market entry barriers to new competitors by marketing innovation. Last but not least, existing legal frameworks and guidelines might also affect marketing innovation activities. For example, while some countries allow aggressive marketing campaigns to attack competing products (e.g. U.S.), they are prohibited by competition law in other countries (e.g. Germany). To overcome such barriers, firms will have to spend higher amounts on marketing campaigns, which in turns raises barriers to such innovation activities. This leads to the following working thesis:

***WT 5.2:** Marketing innovations are affected by market entry barriers in terms of existing trademarks and marketing concepts.*

Sixthly, organisational and marketing innovation might be subject to capital market barriers due to their inherent level of **uncertainty**. In contrast to technological innovation, only some countries offer financial public support specifically addressing organisational and marketing innovation to date. Due to their non-technological and complex nature, the success of organisational and marketing innovation in terms of a clearly identifiable and accountable contribution to the firm's economic performance (in the sense of their return of investment) can hardly be measured (Armbruster et al. 2007, 2008). While marketing innovation such as a new product design or packaging can be physically recognised, organisational innovations cannot be touched or presented in terms of prototypes. This problem becomes even more severe, as especially some types of organisational innovation such as profound changes in organisational structure and design only unfold their positive impacts after they have become fully internalised and routinised within the firm (Bessant/Caffyn 1997). Hence the time needed for their full implementation might be even longer than for technological innovation. The absence of a positive relation may therefore be explained by the significant delay usually associated with the return on investment of such long-term organisational innovation projects. In contrast, new automation machinery, for example, is characterised by certain investment costs and expected values of their productivity and point of return of investment, and thus provides at least a rough basis for strategic decision-making. As a consequence, firms, and particularly external investors, might be more reluctant to devote financial and human resources to organisational and marketing innovation as their implementation costs and their benefits can hardly be assessed by financial or strategic controlling both ex ante and ex

post. Moreover, because of their procedural, long-term characteristic, organisational and marketing innovation it is often necessary for continuous investments to maintain their positive effects (e.g. training programmes, advertising campaigns). Referring to knowledge management systems, Shin (2004) underlines accordingly that the high costs generated by the implementation of such an organisational concept may impede a firm's performance. As a consequence, the perceived uncertainty and long-term character of organisational and marketing innovation's implementation costs and benefits is assumed to be at least at a comparable level to technological innovation.

***WT 6:** Due to their intangible, long-term character as well as the high uncertainty about the outcome of related investments, marketing and organisational innovation might be affected by capital market barriers at least at a level comparable to technological innovation.*

The **seventh** type of barrier refers to **economies of scale**. Similarly to technological fields of innovation, organisational and marketing innovation could also be affected by this aspect. To reduce uncertainty and risk, larger enterprises have the opportunity to test new organisational or marketing innovations in small areas of their organisation or product portfolios. Small and medium enterprises often do not have this opportunity, which might prevent them from undertaking such activities. Most importantly, larger firms are able to receive higher benefits from organisational innovations, for instance, the outcome (savings) of implemented LEAN-processes in a large-scale production are much higher than in a small production lines in SMEs compared to their costs of implementation. Moreover, some organisational innovations (e.g. segmentation of production lines according to customers or product variants, specialised interfaces for collaboration with external partners) are not applicable for SMEs as they lack the necessary human and financial resources. The same applies to marketing innovations (e.g. set-up of new, customer-individualised distribution channels). As a result, SMEs might be more reluctant to undertake innovation activities in these fields. This leads to the next working thesis:

***WT 7:** Organisational as well as marketing innovations are subject to economies of scale.*

Eighthly, the next working theses refers to the lack of qualified personnel and thus to **capability failure**. As shown above, in the case of technological. R&D-based innovation one of the most well-known innovation barriers refers to the lack of qualified personnel (i.e. R&D engineers). Because organisational and marketing innovation are usually not driven by R&D intensity to the same extent as technological innovations (Rammer et al. 2009), one can intuitively assume that capability failure such as the lack of well-trained and skilled personnel are of lesser relevance to these innovation types than to R&D driven product or process innovation.

***WT 8.1:** Organisational and marketing innovation leaves more room to be triggered and carried out by low- and unskilled employees and is thus not likely to be affected by lack of highly qualified personnel to the same extent as technological innovation.*

However, existing studies (Kirner et al. 2009b; Som 2012) show that firms with a larger share of highly skilled personnel tend to be more active in the field of organisational innovation. On the one

hand, this can be interpreted in such way that the relevant knowledge about how to structure and design organisational work flows is closely tied to highly skilled employees. The same accounts for the development of marketing innovation: while this appears quite obvious in the case of product design which might be closely connected to the technical product development itself, the development of new marketing concepts and product placement might be also mainly driven by highly qualified personnel. In contrast to R&D-based innovation, however, it is rather not the lack of highly skilled R&D-engineers, but of highly skilled experts in the fields of organisational management, design and marketing. On the other hand, some organisational innovations like types of job enrichment, job empowerment, flat hierarchy with decentralised decision-making require higher levels of employee qualification to be fruitful. Subsequently, another working thesis can be formulated as follows:

H 8.2: Marketing and organisational innovation activities of firms might be restricted by lack of highly qualified employees comparable to technological innovation.

To summarise, both concepts of market and systemic failures and their underlying policy rationales offer fruitful contributions to identify potential barriers and obstacles for organisational and marketing innovation. It should be pointed out that the formulated working theses are not supposed to be tested or falsified by the following empirical analyses. On the one hand, this is due to the fact that the available quantitative data do not address these issues in sufficient detail, neither do they provide insight into the origins of and reasons for the barriers. On the other hand, the explorative design of firm case interviews, at least because of the very limited number of cases, does not allow for falsification, respectively, it is inherently not aimed at testing hypotheses. As no dedicated theoretical framework exists so far to deal with the research question, the formulated working theses are supposed to summarise the different aspects derived from the fragmented theoretical framework and point to important points of reference of whether and to what degree organisational and marketing innovation might be affected by aspects of market and systemic barriers. Corresponding to the explorative approach of this study, it is furthermore the dedicated aim of the qualitative empirical firm interviews to learn whether these barriers are in fact of practical relevance to firms or whether, based on the intended case-study interviews, even additional barriers can be identified which have not been considered so far.

4 Distribution, relevance and economic effects of organisational and marketing innovation among European firms

4.1 Methodological approach

The quantitative analysis will be based mainly on data of the **Community Innovation Survey (CIS)** which provides extensive geographic coverage and allows for a general overview of the use, importance and economic effects of organisational and marketing innovation across EU economies. Based on the application to EUROSTAT and the subsequent consent of the respective national statistical offices, the national CIS wave CIS2008 of EU countries will be available for analysis (CD-ROM). The country coverage is comparable to the preliminary INNO-Grips work packages. Sample size is $n=127,674$ enterprises of the service and manufacturing sector.

The use of CIS data is preferable for several reasons. Firstly, it provides the most recent innovation microdata available covering all European Member States. Following the innovation measurement guidelines of the latest edition of the Oslo Manual, it contains information about innovation input (innovation expenditure), about external innovation behaviour (search, sourcing and collaboration, by information sources and actor groups used and intensity of use) and about innovation output (successful commercialisation of new products or services, with varying degrees of novelty) and economic performance (growth variables). In addition, it contains ample information on firm demographics such as sectoral affiliation or firm size. The data is thoroughly pre-tested (e.g. through preceding CIS waves CIS 1 and CIS 2) and survey methodology as well as the statistical processing of the surveyed data is state of the art. Last but not least, CIS data also provides weights so that extrapolation to the national economy is possible.

The quantitative analysis of firm-level data will mainly serve the purpose of conduct in an international comparative analysis of the importance and diffusion of organisational and marketing innovation among European enterprises in the manufacturing and service sector. It uses descriptive analysis as well as multivariate regression models. Firstly, it aims to provide a current survey of the importance and diffusion of organisational and marketing innovation firms within the EU Member States. Moreover, as existing studies have yet not provided a clear picture of the effects of organisational and marketing innovation on the economic performance of firms, it will also be the goal of this task to analyse whether and how these types of innovations as independent variables indirectly (e.g. via cross impacts on product or technical process innovation) or directly contribute to firms' economic performance (employment and sales growth) as a dependent variable. As the relationship between organisational and marketing innovation and their economic impacts is likely to be shaped by market and firm characteristics, the analysis will examine firm size (employment and turnover), internal resources (share of employees with tertiary education level), different modes of innovation (cooperative vs. non-cooperative R&D), technological opportunities (industry dummies using the OECD classification of technological levels) and other optional variables depending on their availability in the respective CIS survey (e.g. market structure, financing sources).

Regarding the fields of organisational and marketing innovation, the CIS 2008 data contain information about

- **market introduction activities** (changes to product or service design, market research, changing to marketing methods, launch advertising)
- **design activities** (e.g. in the context of product development, improvement of goods and services)
- implementation of **changes to marketing concepts or strategies**
- introduction of **new management techniques** (e.g. just-in-time, Six Sigma)
- implementation of **major changes in the organisation structure** (e.g. team work, cross-site)
- importance of **external information sources** for innovation (e.g. clients and customers, suppliers, universities)
- **collaboration with external partners** (e.g. suppliers, clients and customers, competitors, universities)

Additional information is also provided about the factors by which the firms' innovation activities were constrained in general (e.g. perceived economic risks, high costs, availability of finance, lack of qualified personnel). But unfortunately, these hampering factors are neither differentiated along different types of innovation nor along technical and non-technical innovation. Therefore, it is not possible to monitor whether and which of these barriers are specific to organisational and/or marketing innovation. As mentioned above, general barriers of firms' innovation activities have already been addressed by the WP 1 study of the INNO-Grips project (Reinstaller et al. 2010) in detail. Therefore, we decided to avoid duplication of work and skip the analysis of the corresponding CIS variable. Instead, the aspects of market and systemic failures will be the major focus of the later firms' case interviews.

Another limiting factor of CIS data is due to the fact that the implementation of organisational and marketing innovation is to date only measured in terms of a dichotomous variable (yes/no). But as Armbruster et al. 2008 suggest, this is unsatisfactory in the case of organisational innovation. Although intra-firm organisational processes or procedures are often assumed to represent a dichotomous split between having and not having them, the introduction of new organisational skills needs – equally to individual skills – to be a cyclic process of articulation and reinforcement of the behaviour. It has to be repeated frequently over a certain period of time to take root in the enterprise and become effective (Bessant et al. 2001). Thus, when empirically measuring the diffusion of organisational procedures or routines, there is a methodological imperative to consider different stages or levels of intensity (Armbruster et al. 2007, 2008).

Moreover, as illustrated before, the term of organisational innovation may include many different concepts and aspects of how to change organisational processes. Therefore, an indicator that merely states whether a firm has implemented organisational innovation or not while disregarding that kind of organisational innovation may only have limited explanatory power. An overall indicator of organisational innovation may merge various business activities in the field of organisational

innovation which are targeted towards different objectives like flexibility, productivity, etc. and thus might not be able to explain specific performance differences (Armbruster et al. 2007). Hence, coining general terms like “management techniques” or “organisational structure” to identify in which area an organisational innovation has been implemented might cause the risk of achieving a very high number of firms (> 80-90 %) which answer this question positively. As a result of a small variance there is the danger of losing the differentiating power of this variable.

Another shortcoming of the CIS survey in the field of organisational innovation lies in the point that it does not consider when it was introduced by the firms. As previously outlined in the evolutionary framework, organisational innovations can be understood as firms’ responses to changed environmental conditions. Hence, the intended positive effects of organisational innovation can be assumed to remain stable as long the environmental conditions do not change, too. This implies that organisational innovations, as opposed to products, are not subject to an ageing process per se. For example, enterprises will gain advantages from concepts like total quality management, supply chain management or just-in-time for more than three years after their first implementation. In contrast, corresponding to the concept of “routines” within the resource-based approach, it can be argued that firms who have implemented organisational innovation earlier than their competitors might gain superior effects as the organisational changes have already reached a higher level of “routinisation”. Thus, it would be preferable to monitor the year of implementation.

Last but not least, the economic effects of marketing and especially organisational innovation cannot be assumed to result in a higher level of a particular, directly corresponding economic output. Due to the complexity of cause and effects between innovation input and economic effects in organisational and marketing innovation, it is obvious that any single innovation activity will impact other performance aspects to a greater or lesser extent and may be positively reinforced by prior performance as well (Richard et al: 2009; March/Sutton 1997). Particularly organisational innovation encompasses many different concepts of how to change the present structure or procedures, since various business strategies are fostered and triggered by different innovative organisational concepts. Hence, indicators of organisational innovation are not able to explain the specific performance impacts of single concepts. While, for example, marketing innovation might show a relatively direct impact on sales with new products, it is not reasonable to postulate such a direct performance relation for organisational innovations. In the case of organisational innovation, it is therefore necessary to use a broader set of performance measures covering different dimensions of firms’ performance (Richard et al. 2009; Som 2012).

For these reasons and to gain additional insight into the diffusion and effects of organisational innovation, the quantitative analysis will use supplementary firm level data from the “**European Manufacturing Survey 2009 (EMS)**”. This survey encompasses firm level data of the manufacturing industry from nine European Member States (Denmark, Finland, Germany, the Netherlands, France, Croatia, Slovenia, Austria, and Spain) and is coordinated by the Fraunhofer Institute for Systems and Innovation Research (ISI). Sample size is 2,861 firms located in the manufacturing sector.

In its 2009 data, the EMS survey contains detailed information about selected organisational concepts, their use, their intensity of use within enterprises, the year of their first implementation as well as the principal aim of utilisation in the following fields:

- Organisation of work (e.g. team work, integration of tasks, cross-functional teams)
- Organisation of production (e.g. customer-focused lines/cells, zero-buffer principle, total cost of ownership)
- Standardisation and knowledge management (e.g. quality circles, quality management)
- Working hours, payment schemes (e.g. flexible working hours, performance incentives)
- Human resource management (e.g. regular individual appraisal interviews, personnel training programmes, possibility of working at home)

Moreover, similar to the CIS survey the EMS survey also provides information on firms' innovation collaboration activities and important sources of knowledge and information. In contrast to CIS, however, it differentiates along different fields of innovation. Therefore, it is possible to analyse collaborative as well as knowledge-sourcing activities of European firms specifically for the field of organisational innovation.

Last but not least, EMS also contains numerous variables of firms' innovation and economic performance. Especially process-related performance dimensions (e.g. manufacturing lead time, labour and total factor productivity, time-to-market, delivery time) are well represented in the survey and allow for additional analysis compared to CIS data. Furthermore, besides the established set of structural variables (e.g. firm size, sectoral affiliation, R&D-intensity), the EMS survey entails also detailed variables covering aspects like the dominant competitive factor of firms (e.g. price, quality, costs, innovation leadership, flexibility), their manufactured product complexity as well as their positioning in the industrial value chain (producer of finished goods for consumers or industrial business, system supplier, components supplier, toll-manufacturer). This is a major merit of the EMS data compared to CIS and allows for particular consideration of the impact of market and competitive variables as outlined in the market-based perspective of strategic management.

Unfortunately, the EMS survey does not cover the field of marketing innovation. Further limitations of the EMS survey lie in the geographic coverage of EU Member States as well as the number of cases within these countries, which is significantly lower than in the CIS survey. Moreover, firm-level data of EMS only cover the manufacturing industry while no information is provided for the service sector. Due to these limitations, the main quantitative analysis will be conducted by using CIS data. The EMS survey will be additionally deployed to analyse the use and diffusion of selected organisational concepts and their economic impacts in more detail.

For both databases the empirical analyses will be composed of a descriptive part and multivariate regression analyses. While the descriptive part is supposed to provide insights on the use and diffusion of organisational and marketing innovation among European firms, the multivariate regression analyses seek to reveal those factors that determine activities in the field of

organisational and marketing as well as to shed light on the direct and indirect impacts of these types of innovation on the economic performance of firms.

4.2 Organisational and marketing innovation – empirical results from quantitative analyses of firm-level data

The next sections present the results from quantitative firm data analyses based on the Community Innovation Survey (CIS) and the European Manufacturing Survey (EMS). In a first step, the more general findings on the diffusion and economic effects of organisational and marketing innovation in manufacturing and service firms in Europe are discussed followed by a more detailed analysis of selected organisational concepts.

4.2.1 Diffusion of organisational and marketing innovation among European enterprises

The latest Community Innovation Survey (CIS) 2008 serves to analyse innovation activities among European firms. The analyses are based on the micro-aggregated data which is available for a subset of European economies. In detail, the data stems from Bulgaria, Cyprus, Czech Republic, Germany, Estonia, Spain, Hungary, Ireland, Italy, Lithuania, Latvia, Norway, Portugal, Romania, Slovenia and Slovakia. In order to prevent the identification of a certain firm, the procedure of micro-aggregation is employed which averages selected variables for three firms based on size and industry. As can be seen in table 2, the sample covers 127,674 observations. The majority of enterprises that participated in the survey is based in Spain (almost 30%). In general, small companies with less than 50 employees prevail in the sample. Large enterprises, on the other hand, build a minority. Only in the case of Germany did more than a quarter of responding enterprises fall into this category. The following analyses are based on unweighted data. The reason is that CIS data cannot be assumed to be a representative sample of the population. This is partly due to selective non-response, and partly to deliberate selection in the sample schemes. Therefore, an alternative is to use weighted regressions in order to correct potential distortions. Whether this is a good solution depends on the circumstances. We regard this as problematic in this particular instance for at least two reasons.

First, the weights provided by the Eurostat are based on simple counts in the NACE cells. We will clarify this procedure in a simplified setting. Suppose that in a NACE three digit cell there exist 10 firms in the population but only 1 has answered, then this firm receives a weight of 10. However, if this one firm having answered happens to be the dominant player in this NACE section (in many industries the size distribution is highly left-skewed) then the count-based weights give a fundamentally biased picture of the firm, because they over-estimate the importance of this firm for the economy as a whole. Weights based on real firm size (such as turnover or employment) would be better suited but are currently not provided to the best of our knowledge.

Second, even if weights are correct, whether it is helpful to use them depends on the task at hand. In particular, if the objective is to use the regression for economy-wide forecasts, then an unbiased sample is particularly relevant. In this case weighted regression is strongly suggested. However, if the aim is testing hypotheses, then weighted regression approaches are undesirable because the significances are driven primarily by a few large companies. Nevertheless, a hypothesis should establish a relationship in a general setting, in the sense that it applies to large as well as small companies. A more promising way to deal with unrepresentative samples is to stay with unweighted regressions but use a broad set of control variables to account for potential distortions due to the incomplete representativeness. This approach was taken by the authors of this study.

Table 2: Description of the sample: country origin and firm size

	Country samples		Firm size			
	%	N	10 to 49	50 to 249	250 and more	Total
			%	%	%	%
Spain	29.3	37,400	62.0	29.1	8.9	100.0
Italy	15.6	19,904	73.4	18.1	8.6	100.0
Bulgaria	12.4	15,859	76.9	19.6	3.5	100.0
Romania	7.5	9,631	43.8	42.7	13.4	100.0
Czech Republic	5.3	6,804	42.4	38.1	19.5	100.0
Portugal	5.1	6,512	65.0	27.3	7.7	100.0
Germany	4.7	6,026	41.8	32.1	26.1	100.0
Hungary	4.2	5,390	54.3	33.8	12.0	100.0
Norway	3.8	4,883	57.4	34.7	7.9	100.0
Estonia	3.1	3,986	60.7	39.3	-	100.0
Slovenia	2.0	2,593	61.7	30.5	7.8	100.0
Slovakia	1.8	2,296	49.6	32.1	18.2	100.0
Ireland	1.7	2,178	65.1	34.9	-	100.0
Lithuania	1.7	2,111	42.8	42.5	14.7	100.0
Latvia	0.8	1,077	53.0	47.0	-	100.0
Cyprus	0.8	1,024	76.7	23.3	-	100.0
Total	100	127,674	61.4	29.0	9.6	100.0

Source: CIS2008, own calculations

As will be described later in more detail, CIS 2008 covers various innovation activities. In all cases, enterprises are asked to indicate whether they have introduced the activities during the three years 2006 to 2008. Therefore, the results might be influenced by the beginning of the financial and economic crises, so that at the end of the three-year period firms might have become hesitant to invest in innovation activities.

Before presenting the results of the multivariate analysis, the following tables aim to describe the sample in more detail with regard to technological and non-technological innovation. Across all countries represented in the sample, the majority of firms is active in manufacturing (table 3). With regard to service activities, the shares of wholesale and retail are highest. This means that in the case of most countries service enterprises that took part in the survey do not fall into the category of knowledge-intensive services.

Table 3: Enterprises by industry

	sector classification						
	Manufacturing, mining and quarrying and other industry	Construction	Wholesale and retail trade	Information and communication	Financial and insurance activities	Professional, scientific, technical, administration and support service activities	Other
	%	%	%	%	%	%	%
Bulgaria	59.3	0.0	32.1	4.5	1.6	2.4	0.0
Cyprus	45.7	0.0	39.1	4.0	8.6	2.6	0.0
Czech Republic	49.1	6.7	18.0	6.6	3.2	15.3	1.1
Estonia	61.0	0.0	20.2	7.7	3.7	7.4	0.0
Germany	63.4	0.0	10.2	7.2	4.4	14.9	0.0
Hungary	58.3	12.7	17.3	4.3	4.6	2.8	0.0
Ireland	39.5	0.0	35.2	8.3	10.8	6.2	0.0
Italy	37.1	21.9	31.0	3.2	4.0	2.1	0.8
Latvia	42.5	0.0	46.1	5.1	4.4	1.9	0.0
Lithuania	50.4	8.1	16.0	9.5	1.7	14.4	0.0
Norway	42.4	12.5	18.3	11.6	4.4	9.6	1.2
Portugal	62.5	0.7	21.0	5.3	4.5	6.0	0.0
Romania	59.4	0.0	29.0	4.7	3.6	3.2	0.0
Slovakia	45.8	18.5	24.9	4.3	3.4	3.2	0.0
Slovenia	56.3	0.0	28.3	6.0	4.0	5.5	0.0
Spain	45.5	8.0	23.9	5.7	1.5	12.3	3.1
Total	49.9	7.6	25.2	5.5	3.1	7.6	1.1

Source: CIS2008, own calculations

Looking at technological innovation activities, table 4 shows that almost one fifth of firms introduced good innovations between 2006 and 2008. The share of firms which implemented process innovations in the form of new methods of manufacturing or producing goods and services is equally high. Service innovations, on the other hand, occur more rarely.

Table 4: Enterprises by innovation activities

	Innovation activities: good, service or process innovation							
	Good innovation in general		Good innovation new to the market		Service innovation		Methods of manufacturing or producing goods and services	
	%	N	%	N	%	N	%	N
Bulgaria	11.3	15,859	6.3	15,859	5.0	2,330	10.4	15,859
Cyprus	16.4	1,024	12.7	1,024	22.0	319	31.3	1,024
Czech Republic	21.2	6,804	18.2	6,804	15.2	1,941	20.7	6,804
Estonia	22.8	3,986	15.6	3,986	17.4	1,332	35.3	3,986
Germany	30.0	5,299	27.2	5,299	17.2	5,834	27.0	5,426
Hungary	12.8	5,390	9.1	5,390	7.1	5,390	10.3	5,390
Ireland	23.7	2,098	19.2	2,098	19.3	783	23.1	2,035
Italy	19.7	19,904	16.9	19,904	15.9	19,904	18.7	19,904
Latvia	17.5	959	10.6	959	10.2	217	21.0	959
Lithuania	13.4	2,111	13.4	2,111	12.8	2,111	22.2	2,111
Norway	18.9	4,883	14.8	4,883	8.8	1,254	12.0	4,883
Portugal	32.1	6,512	22.8	6,512	27.3	2,660	31.6	6,512
Romania	13.6	9,631	7.2	9,631	9.9	1,624	16.2	9,631
Slovakia	14.4	2,296	10.9	2,296	8.9	433	15.0	2,296
Slovenia	24.0	2,593	19.7	2,593	16.6	764	21.7	2,593
Spain	18.9	37,400	12.4	37,400	10.0	8,500	19.3	37,400
Total	18.8	126,749	13.7	126,749	12.2	55,396	18.9	126,813

Source: CIS2008, own calculations

Research on innovation activities during recent years has highlighted the differences with regard to industries. In particular, innovation in services was found to follow different patterns than manufacturing (Tether/Hipp 2000). In particular, knowledge-intensive services are regarded as an important driver of innovation activities also in other sectors (Strambach 2008). In order to shed light on these differences the following table (table 5) breaks down the prevalence of good innovation and service innovation into the three sectors manufacturing, services and knowledge-intensive services. The latter category is a subgroup of services and covers those industries which are characterized by a high proportion of qualified labour. The definition follows Gehrke et al. (2010) and covers knowledge-intensive services at the 2-digit NACE-code level². As can be expected, differences prevail with regard to good innovation among manufacturing firms and service firms. While on average almost thirty percent of manufacturing enterprises are active in this way, in the case of service firms the share is only 12 percent. Knowledge-intensive services reach a share of almost 20 percent. With regard to service innovation the picture is quite different. In this case, knowledge-intensive services reach the highest share of almost 30 percent. The share of manufacturing firms is quite low with only 10 percent.

Table 5: Enterprises with goods and service innovation activities by sector

	Innovation activities: breakdown by sector											
	Good innovation in general						Service innovation					
	Manufacturing		Services		Knowledge-intensive services		Manufacturing		Services		Knowledge-intensive services	
%	N	%	N	%	N	%	N	%	N	%	N	
Bulgaria	15.5	8,942	6.1	6,447	8.7	1,349	4.2	8,942	6.2	6,447	18.3	1,349
Cyprus	31.2	430	5.0	556	3.8	156	17.4	430	25.2	556	50.6	156
Czech Republic	38.1	2,792	11.0	3,011	17.9	1,233	13.3	2,792	19.1	3,011	28.9	1,233
Estonia	33.2	2,160	10.7	1,556	15.0	720	10.6	2,160	27.0	1,556	37.2	720
Germany	45.8	2,832	13.4	1,964	19.6	1,125	10.0	2,828	28.8	1,964	34.6	1,125
Hungary	19.9	2,698	7.8	1,566	10.4	634	4.5	2,698	14.1	1,566	24.9	634
Ireland	38.6	777	15.4	1,257	17.3	513	15.2	671	22.0	1,216	30.4	520
Italy	36.2	6,483	13.8	8,161	28.5	1,753	15.9	6,483	18.9	8,161	37.6	1,753
Latvia	31.3	358	9.5	538	15.6	109	6.4	358	12.6	538	35.2	109
Lithuania	22.4	880	8.2	876	9.8	539	6.9	880	19.9	876	25.6	539
Norway	33.2	1,692	14.3	2,144	15.3	1,206	4.5	1,692	14.3	2,144	21.1	1,206
Portugal	37.0	3,681	27.2	2,398	29.8	1,029	21.0	3,681	37.8	2,398	50.9	1,029
Romania	18.1	5,070	8.9	3,907	15.7	1,111	8.7	5,070	11.4	3,907	19.5	1,111
Slovakia	27.9	824	8.2	820	14.1	249	7.4	824	11.3	820	22.1	249
Slovenia	34.6	1,327	13.6	1,134	24.8	400	16.4	1,327	17.3	1,134	34.5	400
Spain	30.1	15,979	11.1	16,455	21.6	5,204	9.2	15,979	12.0	16,455	26.9	5,204
Total	28.9	56,925	11.5	52,790	19.2	17,330	10.0	56,815	15.7	52,749	29.7	17,337

Source: CIS2008, own calculations

With regard to organisational innovation, CIS 2008 provides information on three types of activities: New business practice (i.e. supply chain management, business re-engineering, knowledge management, lean production, quality management, etc), new methods of organising work responsibilities and decision-making (i.e. first use of a new system of employee responsibilities, team work, decentralisation, integration or de-integration of departments, education/training

². NACE Rev.2 codes: 58-66, 69-75, 86, 90, 91

systems, etc) and new methods of organising external relations (i.e. first use of alliances, partnerships, outsourcing or sub-contracting, etc). Table 6 shows that the implementation of new methods of organising work responsibilities and decision-making is the most frequent type of innovation activity with almost a quarter of firms stating that they have been active in this field between 2006 and 2008. New business practices for organising procedures have been performed by one fifth of firms, while new methods of organising external relations pertains to 12% of enterprises in the sample. Comparing the national shares referring to good or process innovation with those related to organisational innovations, it becomes obvious that in those countries in which the shares of enterprises with good or process innovation are high, the shares of enterprises with organisational innovation is high as well.

Table 6: Enterprises by type of organisational innovation

	Organisational innovations					
	New business practices for organising procedures		New methods of organising external relations		New methods of organising work responsibilities and decision making	
	%	N	%	N	%	N
Bulgaria	9.7	15,859	6.2	15,859	10.8	15,859
Cyprus	32.4	1,024	22.4	1,024	35.1	1,024
Czech Republic	28.1	6,804	14.9	6,804	31.6	6,804
Estonia	16.9	3,986	12.7	3,986	21.9	3,986
Germany	37.4	5,104	20.9	5,108	33.4	5,107
Hungary	13.5	5,390	9.5	5,390	13.7	5,390
Ireland	31.5	2,033	16.8	2,019	31.4	2,029
Italy	17.6	19,904	13.9	19,904	24.9	19,904
Latvia	15.4	959	7.5	959	14.5	959
Lithuania	17.7	2,111	11.9	2,111	18.4	2,111
Norway	15.3	4,832	9.8	4,816	19.6	4,823
Portugal	32.9	6,512	20.7	6,512	34.3	6,512
Romania	14.4	9,631	12.2	9,631	22.8	9,631
Slovakia	21.1	2,296	11.6	2,296	18.8	2,296
Slovenia	-	-	17.9	2,593	26.5	2,593
Spain	25.0	37,400	10.3	37,400	25.2	37,400
Total	20.9	123,845	12.1	126,412	23.4	126,428

Source: CIS2008, own calculations

In CIS 2008, marketing innovation activities are differentiated according to the following types: significant changes to the aesthetic design or packaging of goods or service (excluding changes that alter the product's functional or user characteristics, since these are good innovations), new media or techniques for product promotion (i.e. the first-time use of a new advertising media, a new brand image, introduction of loyalty cards, etc), new methods for product placement or sales channels (i.e. first-time use of franchising or distribution licenses, direct selling, exclusive retailing, new concepts for product presentation, etc) and new methods of pricing goods and services. The results with regard to these types of marketing innovations are displayed in table 7. Media techniques for product promotion appear to be the most common type with on average 16% of enterprises being active in this realm. It can be hypothesized that these activities are mainly

associated with social media. Unfortunately, there is no information available to validate this assumption. Changes to the aesthetic design or packaging have been performed by 12% of firms. In this case it must be noted that innovation of this kind will mainly be relevant for those firms producing tangible products. New methods of pricing goods and services as well as new methods of product placement or sales channels are relevant for about 10% of firms. Again, those countries with high shares regarding marketing innovations also reach higher shares with regard to organisational innovations. In the following section the relationship between technological and non-technological innovation activities will be analysed in more detail.

Table 7: Enterprises by type of marketing innovations

	Marketing innovations							
	Changes to the aesthetic design or packaging		New media or techniques for product promotion		New methods of product placement or sales channels		New methods of pricing goods and services	
	%	N	%	N	%	N	%	N
Bulgaria	6.0	15,859	4.2	15,859	5.1	15,859	4.1	15,859
Cyprus	17.2	1,024	25.3	1,024	20.0	1,024	12.2	1,024
Czech Republic	14.3	6,804	25.5	6,804	11.5	6,804	15.1	6,804
Estonia	14.6	3,986	11.6	3,986	13.2	3,986	11.3	3,986
Germany	24.6	5,068	24.9	5,069	26.6	5,070	20.2	5,070
Hungary	6.9	5,390	8.1	5,390	6.0	5,390	8.9	5,390
Ireland	16.5	2,011	18.2	2,013	12.1	2,002	12.8	2,001
Italy	11.6	19,904	17.8	19,904	8.3	19,904	11.6	19,904
Latvia	11.7	959	13.5	959	7.5	959	11.9	959
Lithuania	10.9	2,111	10.9	2,111	10.6	2,111	16.2	2,111
Norway	14.5	4,845	11.8	4,838	8.5	4,836	6.7	4,835
Portugal	21.0	6,512	24.0	6,512	13.0	6,512	15.4	6,512
Romania	12.4	9,631	14.0	9,631	10.9	9,631	13.7	9,631
Slovakia	9.6	2,296	12.5	2,296	8.1	2,296	10.5	2,296
Slovenia	15.1	2,593	19.7	2,593	16.1	2,593	17.3	2,593
Spain	9.0	37,400	9.8	37,400	7.4	37,400	7.4	37,400
Total	11.5	126,393	15.6	126,389	9.4	126,377	10.2	126,375

Source: CIS2008, own calculations

4.2.2 Relationship of innovation activities and industry as well as size

With regard to the findings presented above, it has to be noted that differences between nations might also be influenced by differences in industry structure of the enterprises represented in the sample. To investigate this aspect further, the following table displays the two most common types of organisational and marketing innovation, i.e. new methods of organising work responsibilities and decision-making and new media or techniques for product promotion by sector. Again, differences among the sectors seem to prevail. With regard to both types of innovation activities, knowledge-intensive services reach the highest share. In the case of new methods of organising work responsibilities and decisionmaking, more than a third of knowledge-intensive service firms implemented these methods, while the shares among manufacturing firms and service firms in general are both at about 24 percent. One fifth of knowledge-intensive service firms implemented

new media or techniques for product promotion. The share of manufacturing is about 13 percent and the share of service firms in general is at about 16 percent.

Table 8: Enterprises with organisational and marketing innovation activities by sector

Organisational and marketing innovation activities: breakdown by sector												
New methods of organising work responsibilities and decision making						New media or techniques for product promotion						
Manufacturing			Services		Knowledge-intensive services		Manufacturing		Services		Knowledge-intensive services	
%	N		%	N	%	N	%	N	%	N	%	N
Bulgaria	12.3	8,942	8.7	6,447	14.5	1,349	4.8	8,942	3.6	6,447	6.8	1,349
Cyprus	36.0	430	34.2	556	46.8	156	24.7	430	26.8	556	37.8	156
Czech Republic	34.7	2,792	30.9	3,011	39.4	1,233	25.7	2,792	27.4	3,011	28.1	1,233
Estonia	33.1	2,777	35.3	1,871	38.5	1,098	9.7	2,160	15.4	1,556	19.2	720
Germany	19.8	2,160	25.6	1,556	29.7	720	25.3	2,754	26.1	1,859	29.9	1,088
Hungary	26.5	15,979	25.2	16,455	36.0	5,204	7.0	2,698	12.9	1,566	16.7	634
Ireland	14.0	2,698	16.7	1,566	22.4	634	16.2	748	20.0	1,203	21.4	504
Italy	31.5	749	31.8	1,217	37.3	510	17.9	6,483	22.8	8,161	26.2	1,753
Latvia	27.6	6,483	25.5	8,161	43.9	1,753	10.3	358	16.2	538	32.1	109
Lithuania	15.0	880	23.1	876	25.6	539	8.2	880	16.4	876	16.9	539
Norway	13.7	358	15.8	538	31.2	109	12.4	1,677	14.9	2,130	17.6	1,198
Portugal	19.9	1,669	20.8	2,122	26.3	1,195	18.9	3,681	32.2	2,398	38.0	1,029
Romania	28.8	3,681	43.1	2,398	50.1	1,029	13.8	5,070	15.0	3,907	17.0	1,111
Slovakia	22.8	5,070	23.1	3,907	27.5	1,111	13.2	824	15.5	820	20.9	249
Slovenia	27.9	1,327	25.6	1,134	34.8	400	17.9	1,327	23.1	1,134	29.3	400
Spain	22.7	824	19.4	820	29.7	249	10.1	15,979	10.9	16,455	14.5	5,204
Total	23.8	56,819	24.2	52,635	34.1	17,289	12.9	56,803	15.8	52,617	20.1	17,276

Source: CIS2008, own calculations

While the results on the differences among industries presented above indicate that there might be a relationship between the utilization of organisational or marketing innovation activities and industries, the question is whether this relationship is significant. In order to test this assumption, probit models were calculated. The models contain a variable covering the 24 industries specified in the sample and dummy variables on the respective innovation activities. Indicative in this test are the indicators χ^2 and the probability values of χ^2 . As the following table (table 9) shows for all forms of organisational and marketing innovation covered, the p-values are equal to zero so that indeed a statistically significant relationship can be confirmed.

Table 9: Test results on the relationship between industry and utilization of organisational and marketing innovation

	LR χ^2	p (χ^2)
New business practice	3,254.49	0.000
New methods of organising work responsibilities and decision making	2,717.23	0.000
New methods of organising external relations	2,134.59	0.000
Changes to the aesthetic design or packaging	5,043.07	0.000
New media or techniques for product promotion	2,128.10	0.000
New methods of product placement or sales channels	2,354.42	0.000
New methods of pricing goods and services	1,483.39	0.000

Source: CIS2008, own calculations

In addition to differences between industries, firm size variation may impact on the likelihood of introducing marketing or organisational innovation. Table 10 investigates this relationship for the total sample and for manufacturing and knowledge-intensive service firms in particular. In general, firms with more than 250 employees are more often among those which performed non-technological innovation activities. The highest deviation refers to the introduction of new business practices for organising procedures followed by the introduction of new methods of organising external relations. With regard to the former activity it can be hypothesized that small firms organize work more flexibly and are not characterized by a deep division of labour, so that new methods of organising work responsibilities and decision-making are less relevant for them.

With regard to manufacturing enterprises a similar picture occurs. But, compared to the total sample the group of larger firms is characterized by higher shares for all innovation activities except for service innovation. Good innovation is clearly most widely spread among manufacturing enterprises in all size classes. On the contrary, among knowledge-intensive service firms service innovation is widely utilized. However, also organisational and marketing innovation activities are more frequent than in the total sample. In particular, new methods of organising work responsibilities and decision-making have high shares even among small enterprises with almost 30% in the group of firms with ten to 49 employees. Among large enterprises more than half of knowledge-intensive service firms innovated in this way.

Table 10: Enterprises with organisational or marketing innovation by size of enterprises

	Organisational and marketing innovation by size		
	10 to 49	50 to 249	250 and more
	%	%	%
Organisational innovation			
New business practices for organising procedures	15.5	26.1	40.6
New methods of organising external relations	9.2	14.4	24.3
New methods of organising work responsibilities and decision making	18.6	28.0	41.2
Marketing innovation			
Changes to the aesthetic design or packaging	8.8	14.3	21.2
New media or techniques for product promotion	11.1	15.4	23.3
New methods of product placement or sales channels	7.4	11.2	16.8
New methods of pricing goods and services	8.4	11.4	17.2
Goods innovation	14.8	23.3	35.9
Service innovation	10.5	13.4	22.8
Manufacturing			
Organisational innovation			
New business practices for organising procedures	16.2	27.0	45.4
New methods of organising external relations	8.0	13.6	25.8
New methods of organising work responsibilities and decision making	17.9	27.9	44.3
Marketing innovation			
Changes to the aesthetic design or packaging	11.8	18.4	28.4
New media or techniques for product promotion	10.2	14.3	23.6
New methods of product placement or sales channels	7.7	11.3	17.5
New methods of pricing goods and services	8.3	11.9	18.0
Goods innovation	21.4	35.2	56.9
Service innovation	8.4	11.1	19.0
Knowledge-intensive services			
Organisational innovation			
New business practices for organising procedures	24.6	34.9	48.9
New methods of organising external relations	17.3	23.8	35.0
New methods of organising work responsibilities and decision making	28.9	38.9	53.2
Marketing innovation			
Changes to the aesthetic design or packaging	11.4	16.8	26.4
New media or techniques for product promotion	16.6	22.7	35.5
New methods of product placement or sales channels	11.8	17.4	26.4
New methods of pricing goods and services	11.3	14.9	26.6
Goods innovation	18.2	21.8	30.2
Service innovation	26.7	35.3	50.5

Source: CIS2008, own calculations

In order to test whether the results presented above are statistically significant, probit models were performed in the same way as above. That means χ^2 and the probability values of χ^2 indicate whether size has an influence on the probability of utilizing non-technological innovation. As the following table (table 11) shows based on the results for all industries, for all forms of organisational and marketing innovation the p-values are almost equal to zero, so that there is

indeed a statistically significant relationship between firm size and the utilization of organisational and marketing innovation.

Table 11: Test results on the relationship between company size and utilization of organisational and marketing innovation

	<i>LR chi2</i>	<i>p (chi2)</i>
New business practice	4,232.65	0.000
New methods of organising work responsibilities and decision making	3,175.47	0.000
New methods of organising external relations	2,087.22	0.000
Changes to the aesthetic design or packaging	1,689.41	0.000
New media or techniques for product promotion	1,230.65	0.000
New methods of product placement or sales channels	1,135.01	0.000
New methods of pricing goods and services	862.02	0.000

Source: CIS2008, own calculations

These findings lead to questioning whether there is a relationship between innovation activities with regard to goods, service or process on the one hand and organisational and marketing activities on the other. In order to test this relationship χ^2 tests were performed for all forms of organisational and marketing innovation activities and goods, process and service innovation. In every case, a highly significant relationship was found, indicating that firms which innovate with regard to goods, process and service are also likely to perform organisational and marketing activities. In addition, a similar analysis was performed for large enterprises as well as for SMEs (less than 250 employees) and for manufacturing firms as well as for knowledge-intensive service firms. In all these cases a highly significant relationship was found. In the following, interesting observations of these investigations will be presented.

Table 12 differentiates those SMEs and large enterprises which introduced new methods of organising work responsibilities and decision-making from those which at the same time performed goods, service or process innovation activities. As might have been expected, the shares of larger firms with neither firm innovation activity is smaller among large enterprises than among SMEs, and, on the other hand, the shares of enterprises with both kinds of innovation activities is higher among larger enterprises.

Table 12: Enterprises with and without innovation activities by size (in %)

		Small and medium enterprises		Large enterprises	
		No	Yes	No	Yes
New methods of organising work responsibilities and decision making					
Goods innovation	No	68.5	13.8	44.1	19.5
	Yes	9.7	8.0	14.2	21.7
Service Innovation	No	73.0	15.4	51.2	25.8
	Yes	5.3	6.4	7.4	15.4
Process innovation	No	68.9	13.2	45.3	18.2
	Yes	9.3	8.6	13.0	23.0
New media or techniques for product promotion					
Goods innovation	No	77.6	4.7	57.2	6.6
	Yes	11.8	5.9	21.4	14.9
Service Innovation	No	80.0	8.4	64.0	13.0
	Yes	7.4	4.2	12.4	10.7
Process innovation	No	74.4	7.7	53.7	10.3
	Yes	13.0	4.9	22.8	13.3

Source: CIS2008, own calculations

In a similar way, the relationship between sectors and innovation activities is analysed in Table 13. As described above, new methods of organising work responsibilities and decision making as well as service innovation are quite common among knowledge-intensive service firms. Hence, the share of firms with both kinds of activities is quite high (19%). Among manufacturing firms the combination of new methods of organising work responsibilities and process innovation as well as good innovation is comparatively frequent (about 13%).

Table 13: Enterprises with and without innovation activities by industry (in %)

		Total sample		Manufacturing		Knowledge-intensive services	
		No	Yes	No	Yes	No	Yes
New methods of organising work responsibilities and decision making							
Goods innovation	No	66.3	14.3	59.9	10.7	57.0	22.6
	Yes	10.1	9.3	16.3	13.2	8.4	12.1
Service Innovation	No	71.0	16.3	71.6	18.1	52.7	15.8
	Yes	5.4	7.3	4.6	5.8	12.5	19.0
Process innovation	No	66.7	13.7	60.8	10.3	57.7	20.7
	Yes	9.7	10.0	15.2	13.6	7.5	14.1
New media or techniques for product promotion							
Goods innovation	No	73.0	7.6	65.8	4.8	67.5	12.1
	Yes	13.4	6.0	21.3	8.2	12.3	8.2
Service Innovation	No	78.5	8.8	80.5	9.2	60.7	7.8
	Yes	7.9	4.8	6.7	3.6	18.8	12.7
Process innovation	No	72.5	7.9	65.6	5.6	67.1	11.3
	Yes	13.9	5.7	21.5	7.4	12.5	9.2

Source: CIS2008, own calculations

In order to investigate the relationship between organisational and marketing innovation activities on the one hand and goods, service and process innovation on the other in a more general way, the three, respectively four forms of organisational and marketing innovation were aggregated in two ordinal scaled variables. The variable on organisational innovation ranges between zero and three with zero indicating no innovation activity and for three all three forms are utilized. In a similar way the variable on marketing innovation ranges between zero and four. In addition, goods, service and process innovations are combined in three ways: goods and service innovation, goods and process innovation as well as goods, service and process innovation. Table 14 further differentiates between manufacturing and knowledge-intensive services. In general, manufacturing enterprises in the sample combine innovation activities to a lesser extent than knowledge-intensive service firms. For example, 12% of manufacturing enterprises indicated having introduced goods innovation but no organisational innovation. In the case of knowledge-intensive service firms, a combination is more frequent. For example, 10% of enterprises are active with regard to service innovation and, in addition, implemented all three forms of organisational innovation activities.

As described above, manufacturing firms are less active in service innovation, but as the table also shows if enterprises have service innovation activities these are less often combined with marketing innovation than goods innovation. Knowledge-intensive service enterprises on the other hand combine service innovation more frequently with marketing innovation activities.

Table 14: Manufacturing and knowledge-intensive service enterprises with and without innovation (in %)

		Manufacturing					Knowledge-intensive services				
		No	1	2	3	4	No	1	2	3	4
Organisational innovation											
Goods innovation	No	56.6	6.2	5.3	2.6		51.3	9.7	10.4	8.3	
	Yes	12.3	5.5	6.7	4.9		6.0	3.4	4.8	6.2	
Service Innovation	No	65.6	9.9	9.2	5.0		48.4	7.7	7.5	5.0	
	Yes	3.3	1.8	2.7	2.5		8.9	5.3	7.7	9.5	
Process innovation	No	57.1	6.4	5.2	2.6		52.2	9.6	9.4	7.1	
	Yes	11.7	5.4	6.7	4.9		5.1	3.5	5.8	7.4	
Goods and service innovation	No	66.8	10.4	9.7	5.3		54.6	11.0	11.7	9.2	
	Yes	2.2	1.3	2.2	2.2		2.9	2.0	3.4	5.2	
Goods and process innovation	No	63.9	7.0	6.0	3.0		57.3	10.8	11.6	9.2	
	Yes	6.5	3.9	5.4	4.3		1.9	1.5	3.1	4.6	
Goods, service and process innovation	No	67.6	10.7	10.1	5.6		56.4	12.1	12.9	10.7	
	Yes	1.4	1.0	1.8	1.9		1.1	1.0	2.2	3.7	
Marketing innovation											
Goods innovation	No	60.5	5.2	2.9	1.2	0.7	61.1	8.0	5.7	2.9	1.9
	Yes	14.0	6.2	4.6	2.7	2.1	8.5	3.5	3.4	2.7	2.3
Service Innovation	No	70.4	9.2	5.7	2.6	1.7	56.2	5.9	3.7	1.7	1.0
	Yes	4.3	2.1	1.8	1.2	1.0	13.2	5.5	5.5	4.0	3.3
Process innovation	No	59.5	5.8	3.5	1.5	0.9	61.0	7.7	5.4	2.7	1.6
	Yes	15.0	5.5	4.1	2.3	1.9	8.6	3.7	3.8	2.9	2.6
Goods and service innovation	No	71.8	9.6	6.0	2.7	1.8	65.1	9.1	6.7	3.4	2.2
	Yes	2.9	1.6	1.5	1.0	1.0	4.7	2.3	2.4	2.2	2.0
Goods and process innovation	No	68.4	5.9	3.3	1.3	0.8	68.2	8.9	6.4	3.2	2.1
	Yes	8.3	4.5	3.6	2.1	1.9	3.5	1.8	2.0	2.0	1.9
Goods, service and process innovation	No	72.7	10.0	6.3	2.9	1.9	67.5	10.2	7.7	4.0	2.6
	Yes	2.0	1.2	1.2	0.8	0.8	2.2	1.2	1.4	1.5	1.5

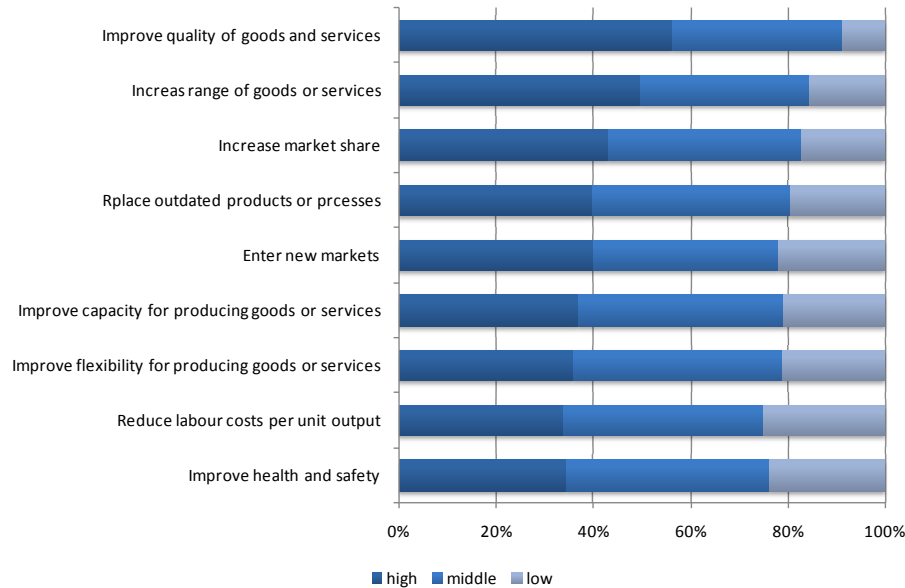
Source: CIS2008, own calculations

4.2.3 Objectives of innovation activities

The CIS 2008 survey also covers the objectives for goods, service and process innovation, organisational innovation as well as marketing innovation. As the spectrum of answer categories differs among the three questions, the following three tables report separately on the importance of objectives.

The objectives for goods, service and process innovation (figure 2) are improvements of the quality of goods and services. In addition, increasing the range of goods and services as well as increasing market share are important objectives for the enterprises. Objectives like reducing labour costs or improving health and safety are less important in comparison.

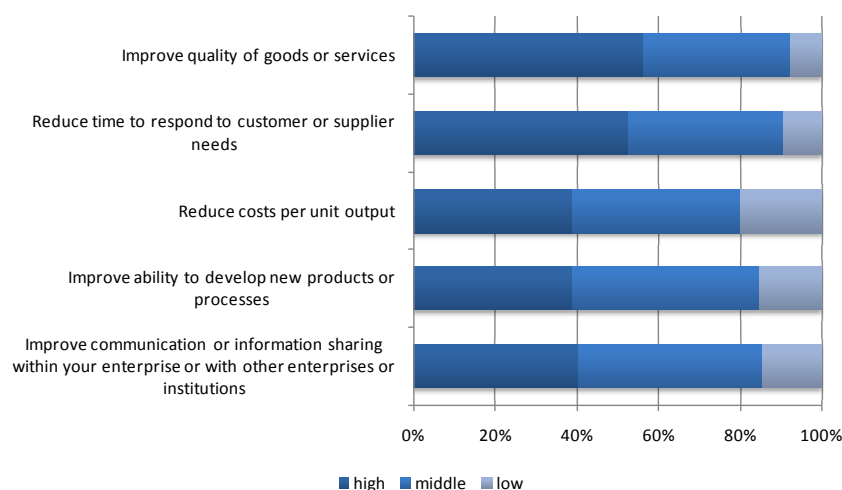
Figure 2: Importance of objectives of goods, service or process innovation



Source: CIS 2008, our own calculations

Looking at the objectives of non-technological innovation activities as covered in CIS, the following figure reveals that organisational innovation activities mainly aim to improve quality of goods and services and to reduce time in responding to customer or supplier needs. In both cases more than fifty percent of enterprises rated these objectives as highly important.

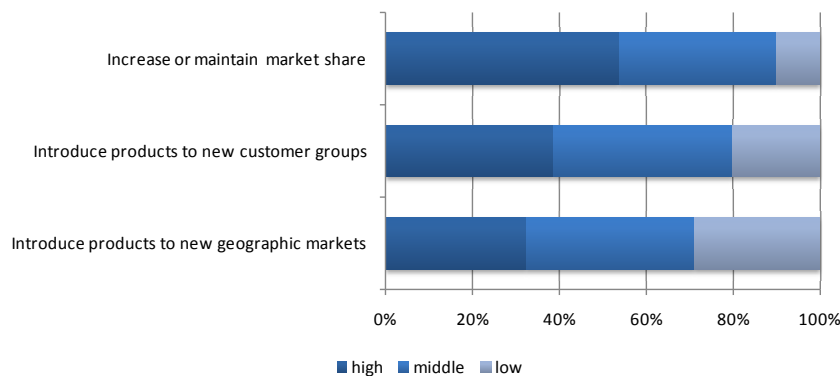
Figure 3: Importance of objectives of organisational innovation



Source: CIS 2008, our own calculations

With regard to marketing innovation figure 4 reveals that increasing or maintaining a market share is the most important objective.

Figure 4: Importance of objectives of marketing innovation



Source: CIS 2008, our own calculations

The comparison of the three figures presented above clearly shows that the objectives of goods, service and process innovation on the one hand and marketing and organisational innovation on the other are similar. It can be assumed that innovation activities in general aim to increase the quality of goods and services and to safeguard or augment market share.

4.2.4 Relationship between marketing and organisational innovation and product as well as service innovation

In the following, the relationship between technological and non-technological innovation will be investigated in more detail. Based on a probit model, the following regression analysis investigates the relationship between goods innovation, respectively service innovation and aspects of organisational and marketing innovation. The models also include other variables to provide a better understanding. Regarding turnover in 2008, four dummy variables on the market were used (0 = no, 1 = yes), i.e. in the survey the enterprises indicated whether they sell their products and services on local/regional, national, European-wide and/or other markets abroad. In addition, the question whether an enterprise belongs to a wider firm group enters the model (dummy variable). The model also monitors industry field and country by implementing dummy variables. In addition, the marginal effects for each variable are computed, indicating in which way the dependent variable would change if one variable changes by one step, all else being equal.

With regard to the influence of organisational innovation on goods innovation, the results of the regression analysis show that the relationship between goods innovation and the implementation of organisational innovation is strong (table 15). All three types of organisational innovation are significant for goods innovation. This finding is in line with Camisón and Villar-López (2012) who, basing their findings on dataset gathered among Spanish manufacturing firms, demonstrate that

organisational innovation activities are conducive for the development of goods and process innovation capabilities.

A relatively high marginal effect is associated with new business practices. If this variable turned to one for all firms in the sample and nothing else changed, the prevalence of goods innovation would be raised by 10 percent.

As the results of our model further show with regard to markets served, selling goods on the local or regional market is the only variable which is not significant. That means serving local markets seems to be an aspect which is not characteristic for firms which introduced good innovations. One explanation might be that these enterprises are mostly small. As shown above, in this group of firms, innovation activities are rarely performed³. Another explanation might be that these firms base their competitiveness on adapting their products flexibly to the demand of their local customers (Som 2012). Also significant in this context is the variable related to company groups. That means, being part of a firm group seems to affect goods innovation in a positive way.

Table 15: Regression analysis – relationship of goods innovation and organisational innovation

	Regression analysis: good innovation			
	Coef.	Significance*	Err.	marginal effect
New business practice	0.4479	***	0.0137	0.1099
New methods of organising work responsibilities and decision making	0.3878	***	0.0136	0.0926
New methods of organising external relations	0.2909	***	0.0149	0.0700
Turnover in 2008	0.0000	***	0.0000	0.0000
Market: Local / regional	-0.0014		0.0135	-0.0003
Market: National	0.2790	***	0.0129	0.0564
Market: Other European Union (EU), EFTA, or EU candidate countries	0.2251	***	0.0125	0.0496
Market: All other countries	0.3158	***	0.0129	0.0746
Company part of a firm group	0.1309	***	0.0113	0.0290
Field-Dummies	YES			
Country-Dummies	YES			
Number of observations	115,923			
Likelihood Ratio (LR) Chi-Square	25,726.02			
Probability Chi-Square	0.00			
Log likelihood	-42,892.79			
Pseudo R-Quadrat	0.23			

Source: CIS2008, own calculations

*) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level

In a similar way, the analysis was performed with service innovation as a dependent variable (table 16). Again, a high level of significance can be found for all variables included except for serving local markets. With regard to the variables on organisational innovation, an influence on service innovation is indeed obvious. The marginal effects again indicate a strong relationship between organisational innovation and service innovation.

3. In addition, a correlation confirms that enterprise size is negatively associated with serving local markets.

Table 16: Regression analysis – relationship of service innovation and organisational innovation

Regression analysis: service innovation				
	Coef.	Significance*	Err.	marginal effect
New business practice	0.5293	***	0.0134	0.1373
New methods of organising work responsibilities and decision making	0.4754	***	0.0133	0.1203
New methods of organising external relations	0.2537	***	0.0146	0.0624
Turnover in 2008	0.0000	***	0.0000	0.0000
Market: Local / regional	-0.0158		0.0133	-0.0035
Market: National	0.1914	***	0.0124	0.0410
Market: Other European Union (EU), EFTA, or EU candidate countries	0.2001	***	0.0123	0.0457
Market: All other countries	0.1839	***	0.0130	0.0434
Company part of a firm group	0.0724	***	0.0113	0.0164
Field-Dummies	YES			
Country-Dummies	YES			
Number of observations	116,032			
Likelihood Ratio (LR) Chi-Square	24,371.81			
Probability Chi-Square	0.00			
Log likelihood	-44,432.42			
Pseudo R-Quadrat	0.22			

Source: CIS2008, own calculations

*) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level

Looking at marketing innovation and the relationships with goods innovation (table 17), a similar picture occurs. In this case, all analysed types of marketing innovation seem to be related to goods innovation in a positive way. The only variable which is not statistically significant in this model is again associated with selling goods at local markets. The marginal effects indicate a particular influence that would occur if changes to the aesthetic design or packaging could be observed for all cases in the sample.

Table 17: Regression analysis – relationship of good innovation and marketing innovation

Regression analysis: good innovation				
	Coef.	Significance*	Err.	marginal effect
Changes to the aesthetic design or packaging	0.7485	***	0.0146	0.2120
New media or techniques for product promotion	0.3401	***	0.0152	0.0836
New methods of product placement or sales channels	0.2017	***	0.0173	0.0476
New methods of pricing goods and services	0.3447	***	0.0159	0.0858
Turnover in 2008	0.0000	***	0.0000	0.0000
Market: Local / regional	-0.0173		0.0135	-0.0038
Market: National	0.2554	***	0.0128	0.0524
Market: Other European Union (EU), EFTA, or EU candidate countries	0.2335	***	0.0124	0.0519
Market: All other countries	0.2995	***	0.0128	0.0709
Company part of a firm group	0.2038	***	0.0112	0.0465
Field-Dummies	YES			
Country-Dummies	YES			
Number of observations	118,489			
Likelihood Ratio (LR) Chi-Square	28,226.23			
Probability Chi-Square	0.00			
Log likelihood	-43,090.93			
Pseudo R-Quadrat	0.25			

Source: CIS2008, own calculations

*) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level

Finally, the same analysis was performed with regard to service innovation (table 18). The forms of marketing innovation analysed are positively correlated with service innovation. But, serving local markets turns out to have a negative yet statistically significant effect on service innovation.

These results which underline the relationship of marketing innovation with technological innovation are also confirmed by Filippetti (2011). In a study based on the Innobarometer Survey 2009 the author focuses on the importance of design. The findings confirm that design as a marketing innovation seems to complement R&D activities, implying that these activities are complementary to other kinds of innovation activities.

Table 18: Regression analysis – relationship of service innovation and marketing innovation

	Regression analysis: service innovation			
	Coef.	Significance*	Err.	marginal effect
Changes to the aesthetic design or packaging	0.5526	***	0.0144	0.1548
New media or techniques for product promotion	0.3007	***	0.0150	0.0771
New methods of product placement or sales channels	0.2107	***	0.0169	0.0528
New methods of pricing goods and services	0.4182	***	0.0154	0.1127
Turnover in 2008	0.0000	***	0.0000	0.0000
Market: Local / regional	-0.0297	**	0.0130	-0.0069
Market: National	0.1834	***	0.0121	0.0407
Market: Other European Union (EU), EFTA, or EU candidate countries	0.2159	***	0.0121	0.0509
Market: All other countries	0.1808	***	0.0127	0.0438
Company part of a firm group	0.1616	***	0.0109	0.0387
Field-Dummies	YES			
Country-Dummies	YES			
Number of observations	118,596			
Likelihood Ratio (LR) Chi-Square	22,485.91			
Probability Chi-Square	0.00			
Log likelihood	-46,721.22			
Pseudo R-Quadrat	0.19			

Source: CIS2008, own calculations

*) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level

In sum, the findings presented above hint that non-technological innovation activities are correlated with goods or service innovation activities. While non-technological innovation activities had been neglected for a long time, recent studies confirm these findings as well. Based on CIS4 data for UK, Battisti and Stoneman (2010) show that technological and non-technological innovation activities complement each other. Mothe and Thi (2010) investigate the link between non-technological innovations and technological innovation based on the CIS4 dataset from Luxembourg. With regard to the propensity to innovate they find a positive influence of non-technological innovation. Organisational innovation in their study, on the other hand, appears to have no direct effect on innovative performance. One explanation for this unexpected result might be the existence of a time-lag, so that the effects are not yet covered in the data.

4.2.5 Economic effects of organisational and marketing innovation

The following chapter aims to analyse the effects of organisational and marketing innovation on economic performance. The CIS 2008 survey contains information on sales in 2006 and 2008. Based on these variables the annual growth rate of sales is calculated. While this indicator has its strengths in its easy availability, there are also shortcomings associated with it: sales and sales growth opposed to innovative performance is influenced by factors which are external to the firm, like market development. Nonetheless, being aware of certain shortcomings, annual sales growth is chosen as an indicator for firms' performance and serves as a dependent variable for the following analysis.

To analyse the impact of organisational and marketing innovation on sales growth in more detail, a regression analysis was conducted based on a linear regression model. For this analysis the independent variables chosen are: forms of organisational, respectively marketing innovation,

turnover in 2006 (accounting for a time lag), the market orientation of the enterprises covered by four dummy variables (see above for a description), a dummy variable to indicate whether a firm is part of a group as well as three dummy variables on goods, process and service innovation. In addition, a set of dummy variables examines industry and country influences.

The first regression model contains the three forms of organisational innovation as independent variables. The findings are presented in table 19. As the results signify, among the organisational innovation variables the implementation of new methods of organising external relations has a highly significant and positive relationship with sales growth, while the other two forms of organisational innovation are not statistically significant. Among the indicators on markets served, only one indicator has a statistically significant effect: serving local markets is negatively associated with sales growth. In addition, activities in process and service innovations are positively and significantly correlated with sales growth. This finding hints that technological as well as non-technological innovation activities might complement each other.

Table 19: Regression analysis – relationship of organisational innovation activities and sales growth (dependent variable)

	Regression analysis: sales growth			
	Coefficient	Standard Error	t	Significance (p)
New business practice	-0.0525	2.3986	-0.02	0.983
New methods of organising work responsibilities and decision making	-0.3106	2.3318	-0.13	0.894
New methods of organising external relations	6.2357	2.6248	2.38	0.018 **
Turnover in 2006	0.0000	0.0000	0.9	0.37
Market: Local / regional	-3.5081	2.0550	-1.71	0.088 *
Market: National	-0.6256	1.8106	-0.35	0.73
Market: Other European Union (EU), EFTA, or EU candidate countries	-1.1283	1.9924	-0.57	0.571
Market: All other countries	0.9148	2.2567	0.41	0.685
Company part of a firm group	2.8536	1.8341	1.56	0.12
Goods innovation	-1.3126	2.2949	-0.57	0.567
Service innovation	5.4567	2.5268	2.16	0.031 **
Process innovation	3.9042	2.2178	1.76	0.078 *
Constant	0.7636	9.1647	0.08	0.934
Field-Dummies	YES			
Country-Dummies	YES			
Number of observations	74,568			
R-Quadrat	0.0008			
Adjusted R-Quadrat	0.0002			

Source: CIS2008, own calculations

*) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level

In the following analysis (table 20) the relationship of various forms of marketing innovation and sales growth is investigated. Implementing new methods of product placement or sales channels shows a statistically significant relationship with sales growth as well as new methods of pricing goods and services. As the coefficients indicate, this effect is positive. Serving local markets, on the other hand, is as well negatively associated with sales growth. Being part of a firm group turns

out to be linked with sales growth. Also in this case, service innovation has a positive and statistically significant relationship with sales growth.

With regard to both models, the fact that other forms of organisational or marketing innovation except for three seem not to be associated with sales growth does not mean that there is no effect at all. In particular, it can be assumed that the effect of these forms of innovation have a long term effect on economic indicators like sales growth. Although the model tries to cover time-lags by using the turnover of 2006, it can be assumed that the effects of innovation activities vary regarding the time-lags associated with them. In the two models, the indicators which are likely to have quite an immediate effect on sales growth, namely methods of organising external relations, methods of product placement or sales channels as well as methods of pricing goods and services, indeed turn out to be statistically significant. Apart from time-lags, other forms of non-technological innovation might have an indirect effect on firms' performance. That means non-technological innovation might be conducive to technological innovation, which more directly impacts on the performance of firms (Camisón and Villar-López 2012).

Table 20: Regression analysis – relationship of marketing innovation activities and sales growth (dependent variable)

	Regression analysis: sales growth			
	Coefficient	Standard Error	t	Significance (p)
Changes to the aesthetic design or packaging	-1.6827	2.6711	-0.63	0.529
New media or techniques for product promotion	1.4950	2.5713	0.58	0.561
New methods of product placement or sales channels	6.8117	2.9779	2.29	0.022 **
New methods of pricing goods and services	5.8584	2.7510	2.13	0.033 **
Turnover in 2006	0.0000	0.0000	-0.89	0.372
Market: Local / regional	-3.4524	2.0079	-1.72	0.086 *
Market: National	-0.8061	1.7620	-0.46	0.647
Market: Other European Union (EU), EFTA, or EU candidate countries	-1.0682	1.9395	-0.55	0.582
Market: All other countries	0.9004	2.1853	0.41	0.68
Company part of a firm group	3.1275	1.7757	1.76	0.078 *
Goods innovation	-1.7966	2.2672	-0.79	0.428
Service innovation	4.6095	2.4550	1.88	0.06 **
Process innovation	3.5284	2.1465	1.64	0.1
Constant	1.0175	9.0431	0.11	0.91
Field-Dummies	YES			
Country-Dummies	YES			
Number of observations	76,506			
R-Quadrat	0.0009			
Adjusted R-Quadrat	0.0003			

Source: CIS2008, own calculations

*) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level

In order to shed light on the differences between sectors, the models were calculated for manufacturing and knowledge-intensive service enterprises. Table 21 contains the regression results of the four models. Model I focuses on organisational innovation among knowledge-intensive service firms. Only two variables are statistically significant: goods innovation and serving extra-European markets. In the case of goods innovation, the coefficient is even negative. In model

II, which focuses on marketing innovation activities, a similar result is revealed. In addition, changes to the aesthetic design or packaging are statistically significant with a negative coefficient. The negative relationship of goods innovation and sales growth in the models might be related to the rare occurrence of this innovation activity among knowledge-intensive service firms, which generally offer intangible products. This might also explain the negative coefficient in the case of changes to the aesthetic design or packaging, as the activity is only relevant for tangible products. Model III focuses on organisational innovation activities among manufacturing enterprises. In this case, the only statistically significant variable refers to service innovation. A similar result is obtained in model IV regarding marketing innovation activities. In both cases the coefficient of service innovation is positive.

Table 21: Regression analysis – relationship of marketing and organisational innovation on sales growth (dependent variable) among manufacturing and knowledge-intensive service enterprises

Regression analysis: sales growth								
Knowledge-intensive services				Manufacturing				
I		II		III		IV		
Coefficient	t	Coefficient	t	Coefficient	t	Coefficient	t	
New business practice	0.5315	-0.06		-1.1508	-0.78			
New methods of organising work responsibilities and decision making	-2.1362	-0.23		0.9083	0.63			
New methods of organising external relations	10.6620	1.14		2.2438	1.36			
Changes to the aesthetic design or packaging			-23.5779	-2.25**			0.2961	0.20
New media or techniques for product promotion			8.8509	0.91			0.8041	0.49
New methods of product placement or sales channels			13.2597	1.21			2.4079	1.33
New methods of pricing goods and services			17.3295	1.63			1.5395	0.91
Turnover in 2006	0.0000	0.08	0.0000	-0.63	0.0000	-0.27	0.0000	-0.50
Market: Local / regional	1.6439	0.19	1.8438	0.22	-0.6844	-0.56	-0.7003	-0.59
Market: National	-0.4068	-0.05	-0.5907	-0.07	-0.1268	-0.11	-0.2659	-0.23
Market: Other European Union (EU), EFTA, or EU candidate countries	4.0637	0.49	3.8600	0.48	0.0959	0.08	0.0767	0.07
Market: All other countries	16.0356	1.67*	15.6485	1.68*	-0.2625	-0.21	-0.2875	-0.23
Company part of a firm group	0.8607	0.12	1.1098	0.16	1.5410	1.29	1.7248	1.49
Goods innovation	-15.4493	-1.71*	-15.2435	-1.73*	0.4932	0.39	0.1457	0.12
Service innovation	5.3011	0.64	4.0613	0.5	3.0889	1.87*	2.7246	1.70*
Process innovation	13.0883	1.46	12.4406	1.43	0.6659	0.54	0.4831	0.41
Constant	-10.4451	-0.37	-8.5787	-0.46	1.9427	0.88	0.7318	0.35
Field-Dummies	YES		YES		YES		YES	
Country-Dummies	YES		YES		YES		YES	
Number of observations	10,407		10,701		32,923		33,854	
R-Quadrat	0.0020		0.0028		0.0007		0.0008	
Adjusted R-Quadrat	-0.0009		-0.0002		-0.0002		-0.0001	

Source: CIS2008, own calculations

*) ***= significant at the 99% level, **= significant at the 95% level, *= si

To analyse the impact of the simultaneous implementation of organisational and marketing innovation, a further regression analysis was carried through. All forms of marketing innovation are put together in one single variable. The variable ranges between 0 and 4, with 0 signifying no marketing innovation and 4 where all four forms of marketing innovation are performed. In a similar way, the forms of organisational innovation covered in the CIS 2008 survey are integrated into one variable, which ranges between 0 and 3. In order to estimate the relevance of the interaction of both forms of innovation, the variables on organisational innovation and marketing innovation are multiplied. Thus, the values of this variable can range between 0 and 12. If an enterprise introduced several forms of marketing innovation, but indicated that it did not perform any form of

organisational innovation, the value turns 0 for the interaction variable. In addition to these three variables, the model contains indicators on turnover, market orientation and firm groups as in the previous models. It also monitors industry and country influences. As the results indicate (table 22), the interaction variable between marketing and organisational innovation has a statistically significant as well as positive effect on sales growth. Both other indicators for marketing innovation and organisational innovation, on the other hand, are also statistically significant, but they have a negative effect. This result indicates that performing marketing or organisational innovation without implementing the other simultaneously might have a negative effect on a firm's performance, at least in the short run. Moreover, this model underlines that serving local markets affects sales growth negatively, while being part of a firm group has a significant and positive effect. Utilizing service innovation activities has a positive and statistically significant effect on sales growth, indicating a cumulative interdependence of innovation activities.

Table 22: Regression analysis – relationship of the interaction of marketing with organisational innovation and sales growth (dependent variable)

	Regression analysis: sales growth			
	Coefficient	Standard Error	t	Significance (p)
Marketing innovation (degree 0 to 4)	-2.7960	1.3923	-2.01	0.045 *
Organisational innovation (degree 0 to 3)	-2.5393	1.0590	-2.4	0.016 **
Interaction of marketing and organisational innovation (degree 0 to 12)	3.9605	0.7004	5.65	0 ***
Turnover in 2006	0.0000	0.0000	-1.1	0.27
Market: Local / regional	-3.4502	2.0562	-1.68	0.093 *
Market: National	-0.5501	1.8134	-0.3	0.762
Market: Other European Union (EU), EFTA, or EU candidate countries	-0.8835	1.9938	-0.44	0.658
Market: All other countries	0.7699	2.2581	0.34	0.733
Company part of a firm group	3.2373	1.8339	1.77	0.078 *
Goods innovation	-1.8823	2.3210	-0.81	0.417
Service innovation	4.4765	2.5430	1.76	0.078 *
Process innovation	3.4734	2.2236	1.56	0.118
Constant	1.2396	9.1658	0.14	0.892
Field-Dummies	YES			
Country-Dummies	YES			
Number of observations	74,521			
R-Quadrat	0.0013			
Adjusted R-Quadrat	0.0007			

Source: CIS2008, own calculations

*) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level

The regression was also calculated for knowledge-intensive service and manufacturing enterprises separately. The results for knowledge-intensive enterprises (table 23) show that also in this case, the interaction of marketing and organisational innovation activities is positively related to sales growth. Goods innovation is the only other variable which is statistically significant. In the case of manufacturing enterprises, two variables are statistically significant: the interaction of organisational and marketing innovation activities with a positive coefficient while organisational innovation activities have a negative coefficient. This also means that these models hint that a combination of innovation activities might be conducive to growth.

Table 23: Regression analysis – relationship of the interaction of marketing with organisational innovation and sales growth (dependent variable) among manufacturing and knowledge-intensive service enterprises

	Regression analysis: sales growth			
	Knowledge intensive services		Manufacturing	
	Coefficient	t	Coefficient	t
Marketing innovation (degree 0 to 4)	-3.5425	-0.6	-0.8407	-1.01
Organisational innovation (degree 0 to 3)	-2.3356	-0.59	-1.2000	-1.77*
Interaction of marketing and organisational innovation	4.4343	1.68*	1.5012	3.46***
Turnover in 2006	0.0000	-0.74	0.0000	-0.64
Market: Local / regional	2.0353	0.23	-0.7399	-0.61
Market: National	-0.2722	-0.03	-0.1729	-0.14
Market: Other European Union (EU), EFTA, or EU candidate	4.5956	0.56	0.1699	0.14
Market: All other countries	15.6258	1.62	-0.3438	-0.27
Company part of a firm group	0.7404	0.1	1.7199	1.43
Goods innovation	-16.5110	-1.81*	0.2834	0.22
Service innovation	4.9441	0.59	2.5795	1.55
Process innovation	11.3919	1.26	0.5769	0.47
Constant	-10.1166	-0.36	1.0084	0.47
Field-Dummies	YES		YES	
Country-Dummies	YES		YES	
Number of observations	10,394		32,901	
R-Quadrat	0.0023		0.0012	
Adjusted R-Quadrat	-0.0006		0.0003	

Source: CIS2008, own calculations

*) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level

Summarising the findings presented above, evidence was presented that those forms of non-technological innovation activities which impact on external relations and sales channels have a positive relationship with sales growth. In addition, the interaction of innovation activities, i.e. organisational innovation as well as marketing innovation, appears to be associated with growth. Furthermore, non-technological innovation activities seem to be related with goods and service innovation. Thus, it can be hypothesized that those enterprises which perform a combination of innovation activities will benefit most from these endeavours in terms of innovative and economic performance. These findings are in line with evidence from other studies: Schmidt and Rammer (2007) use German CIS4 data to analyse the linkage between technological and non-technological innovation activities. They confirm a positive effect of organisational as well as marketing innovation on technological innovation activities. In addition, they also confirm the finding that the combination of both kinds of non-technological innovation activities to be most conducive to economic growth. This result has also been verified by Evangelista and Vezzani (2010), Schubert (2010) as well as Sappasert and Clausen (2012).

Nonetheless, the results also showed that undertaking organisational and marketing innovation activities depend on firm size as well as on industry background. In particular with regard to the relationship with industries more research is needed to better understand the circumstances and framework conditions for innovation activities. There might be systemic obstacles impeding firms from undertaking non-technological innovation activities. Only if these barriers are fully understood, can appropriate action be taken.

Another critical aspect refers to the operationalisation of marketing and organisational innovation activities in CIS, which are based on the Oslo Manual. For example, the results of EMS which will be presented in the following are based on a broader set of organisational innovation activities. Therefore, the critical question is whether CIS covers the most important forms of innovation activities in the appropriate way of disaggregation. Ideally, the categories should be collectively exhaustive as well as mutually exhaustive. On the background of the differences among industries with regard to the prevalence and relevance of innovation activities, challenges in meeting these objectives become apparent.

4.2.6 In-depth analysis of the distribution, determining factors and effects of selected organisational concepts among European manufacturing firms

Departing from the CIS results about the interlinkages between technical fields of innovation and organisational and marketing innovation as well as their positive impact on the general economic performance level of firms, this section will provide a closer look at concrete organisational concepts. This additional analysis thereby supplements the rather general approach of CIS by providing further insights into how organisational innovations are used in the form of different exemplary concepts in the daily business practice of European manufacturing firms, and how they contribute to their economic success. Besides some insights on the diffusion and relevance of different organisational concepts, the findings will furthermore investigate how their propensity of use is systematically related to structural or strategic characteristics of the firms. This may gain additional information on the possible existence of market or systemic failures that could be subsequently explored within the qualitative firms' case interviews.

As described above, the use and diffusion of some exemplary organisational concepts and instruments is analysed in more detail on the basis of the *European Manufacturing Survey (EMS)* coordinated by the Fraunhofer ISI. The EMS survey is conducted as a written or online survey. In all partner countries the questionnaire is translated into the respective national language(s). The content was only adapted to take into account country-specific terminology as well as location-based questions. The national data are subjected to a joint validation/harmonisation procedure in preparation for multi-national analyses. The survey comprises a core of indicators which was jointly agreed upon in the EMS consortium⁴ covering the innovation fields "technical modernisation of the value added processes", "introduction of innovative organisational concepts and processes" as well as "new business models to complement the product range with innovative services". These EMS questions are asked in all participating countries. Moreover, in some countries additional data is collected on specific issues. In turn, this means that not every question available in the German questionnaire is also available for all countries.

⁴ for detailed information about the EMS consortium as its national partners see <http://www.isi.fraunhofer.de/isi-en/i/projekte/fems.php>

The latest *European Manufacturing Survey (EMS)* 2009 was carried out in eight European Member States comprising Denmark, Finland, Germany, the Netherlands, France, Slovenia, Austria, and Spain. In the context of this study, we also decided to include Croatia, which will reach full EU Member status in 2013. The selected country samples account for a total sample of 2,861 enterprises across European manufacturing industries, while the service sector is not covered by EMS. Table 24 shows the firms' sample distribution across the European countries. All country samples are based on stratified random sampling by size and industry to provide a valid picture of the size- and industry-related structure of the underlying manufacturing sector.

As can be seen from table 24, the German sample represents by far the largest country sample in the dataset with more than 1,400 manufacturing firms, followed by Denmark, Austria and the Netherlands. At the other end, smaller countries such as Croatia and Slovenia are represented by less than 100 cases. This means that the descriptive results presented in the following sections are likely to be biased by the large number of the German sample. In the context of multivariate regression analysis, this effect will be controlled by using dummies indicating each country.

Table 24: Description of the selected EMS sample by country and firm size

Country samples			Firm size			
			20 to 49 employees	50 to 249 employees	250 and more employees	Total
	%	N	%	%	%	%
Austria	10.6	302	49.7 [53,5]	36.1 [35,7]	14.2 [10,8]	100.0 *
Denmark	11.5	328	51.3 [53,8]	39.5 [38,0]	9.2 [8,3]	100.0 *
Finland	4.4	125	47.2 [52,1]	48.8 [37,9]	4.0 [10,0]	100.0
France	5.5	158	42.4 [58,8]	41.1 [32,5]	16.5 [8,8]	100.0
Germany	50.5	1444	34.3 [42,5]	49.6 [46,1]	16.1 [11,5]	100.0 *
Netherlands	8.2	234	56.4 [58,2]	38.9 [33,9]	4.7 [7,8]	100.0 *
Slovenia	2.4	70	21.4 [47,4]	54.3 [41,4]	24.3 [11,2]	100.0
Spain	4.0	114	50.9 [69,3]	41.2 [26,5]	7.9 [4,3]	100.0
Croatia	3.0	86	24.4 -	54.7 -	20.9 -	100.0 n.a.
Total	97.0	2775				

Source: EMS 2009, Fraunhofer ISI, own calculations. [Eurostat 2007, tables sbs_sc_2d_d..02, extracted 4-7-2012].

Note: * no significant difference between distribution of EMS data and Eurostat data. n.a. = data not available.

Looking at the firms' size distribution in the EMS sample, it can be stated that all firms' sizes are represented sufficiently. Especially the group of small and medium-sized firms (SME) is covered very well and accounts for about 80 to 90 % in most of the country samples. As the comparison between the firms' size distribution of the EMS sample and the statistical data provided by EUROSTAT shows, there is no significant size bias for the larger subsamples of Austria, Denmark, Germany and the Netherlands. As Croatia will not reach its status as a full EU Member State until 2013, there are no data available at EUROSTAT yet. The group of small firms with less than 50 employees is, however, slightly underrepresented in the total sample. But due to the general reluctance of such small firms to participate in innovation surveys and their lesser awareness of innovation-related issues, this accounts for all larger firm surveys. Moreover, the questionnaire is

mainly focused on facts and figures and not on subjective estimations, which additionally decreases the willingness of representatives of micro-firms to return a useable questionnaire.

Table 25: Description of the selected EMS sample by sector affiliation

	Sector classification on R&D intensity				
	Firms in the non-R&D-intensive sector	Firms in the sector of highly developed	Firms in the high technology sector	Total	
	%	%	%	%	N
<i>Country</i>					
Austria	32.1 [37,4]	61.9 [58,0]	6.0 [4,6]	100	302 *
Denmark	27.7 [29,7]	64.9 [64,4]	7.3 [6,0]	100	328 *
Finland	28.8 [28,2]	68.0 [67,3]	3.2 [4,6]	100	125 *
France	31.6 [33,7]	61.4 [60,1]	7.0 [6,2]	100	158 *
Germany	22.4 [26,4]	67.2 [66,1]	10.3 [7,4]	100	1444 *
Netherlands	28.2 [28,9]	66.7 [66,1]	5.1 [4,9]	100	234 *
Slovenia	7.1 [32,6]	84.3 [62,2]	8.6 [5,1]	100	70
Spain	33.3 [37,6]	60.5 [59,8]	6.1 [2,3]	100	114 *
Croatia	37.2 -	59.3 -	3.5 -	100	86 n.a.

Source: EMS 2009, Fraunhofer ISI, own calculations. [Eurostat 2007, tables sbs_sc_2d_d...02, extracted 4-7-2012].

Note: Sector classification based on the typology of Legler/Frietsch (2006) using 2 digit level of classification.

* no significant difference between distribution of EMS data and Eurostat data. n.a. = data not available.

As can be seen from table 25 above, the firms' sample is composed by all kinds of manufacturing sectors, including non-R&D-intensive sectors (e.g. food, beverages, textiles, metal processing), sectors of highly developed products (e.g. automotive industry, mechanical engineering) as well as the so-called high technology sectors (e.g. medical engineering, systems for measurement and control, electrical engineering). Comparing the sector classification structure of the EMS sample with EUROSTAT data - as far as available - reveals a very good representation regarding the sector distribution. Firms which belong to sectors of highly developed products represent two thirds of the manufacturing industry in every country concerned. High technology sectors count only for less than 10 % of the firms. This picture is very well covered by EMS 2009 data; chi square tests comparing the distribution of EMS and EUROSTAT data did not reveal significant differences for almost all sub-samples. Only for the Slovenian subsample, a structural bias within the sectoral R&D intensity has to be stated, indicating that a disproportional high share of surveyed firms belong to sectors of highly developed products. Hence, the EMS 2009 sample covers the whole range regarding a firms' size as well as regarding sector, providing a reliable and valid database for the intended quantitative analyses. According to previous CIS analysis, the analyses based on EMS are also conducted on the basis of unweighted sample data and are thus not representative for the whole spread of European manufacturing firms. Last but not least, as most of the firm-level data refer to the year 2008 in the EMS 2009 data, it is very likely that they were affected by the global financial and economic crisis in 2008 and 2009, which could result in lower levels of innovation activities and lead to an underestimation of firms' innovation activities compared to their "regular" innovation intensity.

The following sections present the findings from descriptive empirical analyses of the EMS data about the use and distribution of some selected organisational concepts and innovation collaboration activities among European firms according to different firms' characteristics. Moreover, they provide pioneer insight into the interrelationship between certain characteristics of firms and the early implementation of organisational concepts. Last but not least, the picture is completed by shedding some light on the most important sources of knowledge and information for organisational innovation as well as the external partners with which manufacturing firms tend to cooperate in the field of organisational innovation.

4.2.7 Use of selected organisational concepts in different European countries

As described above, the selected organisational concepts represent distinct examples of different firm-internal fields of organisation such as organisation of work, organisation of production, standardisation and knowledge management, working hours and payment schemes as well as human resource management. These examples have been chosen due to their diffusion in the manufacturing sector, so that organisational innovation could be analysed by the patterns of already well-established concepts. While most of the concepts clearly refer to the core dimensions of organisational innovation, authors like Black and Lynch (2005) view organisational innovation as also including components such as workforce training in the sense of the institutionalised routines of learning and development of the internal resource basis. The concept of total cost of ownership (TCO) is a complex management approach, which requires that the buying firm determines which costs it considers most important or significant in the acquisition, possession, use and subsequent disposition of goods or service. In addition to the price paid for the item, TCO may include such elements as order placement, research and qualification of suppliers, transportation, receiving, inspection, rejection, replacement, downtime caused by failure, disposal costs and so on (Ellram 1995). Thereby, TCO represents a holistic management approach to assess and improve direct and particularly indirect costs structure of organisational settings, processes and routines.

Table 26 shows how the selected organisational concepts chosen from the EMS survey correspond to the categories of the Oslo Manual. It can be seen from the table that the selected concepts cover all three meta-categories of the Oslo Manual, although slightly putting emphasis on new management techniques and business practices. Hence, both approaches of the Oslo Manual and the EMS are strongly complementary to each other, with the EMS providing detailed information on single concepts that are summarised under the umbrella of the Oslo Manual's more general categories.

Table 26: Organisational innovation categories in CIS and EMS

Oslo-Manual category of organisational innovation ^a	Selected organisational concepts from-EMS ^a
New management techniques / new business practices ^a	Internal zero-buffer principle, total cost of ownership, quality circle, knowledge base systems, flexible working time arrangements, team performance incentives, regular individual appraisal interviews, training programmes ^a
New methods of organising work and decision-making ^a	Teamwork, task integration, temporary cross-functional project teams, shop floor segmentation, teleworking ^a
New methods of managing external relations ^a	Participation in innovation collaboration with external partners ^a

Table 27: Use of selected organisational concepts by country (percentage of firms using the concept)

	Country									Total	N
	Germany	Austria	Netherlands	France	Denmark	Croatia	Finland	Spain	Slovenia		
	%	%	%	%	%	%	%	%	%	%	
Organisation of work											
Teamwork in production ***	60.4	67.1	39.4	75.2	71.6	87.2	71.8	77.5	84.3	64.1	1807
Task integration ***	54.5	61.3	52.6	45.5	63.7	53.5	54.9	57.3	47.1	55.6	1545
Temporary cross-functional project teams ***	50.6	49.3	29.3	30.1	46.3	33.7	41.9	34.6	54.3	45.7	1270
Organisation of production											
Shop floor segmentation ***	28.8	29.5	45.0	36.5	33.2	55.8	52.4	46.3	58.6	34.4	957
Internal zero-buffer principle ***	22.2	18.2	29.3	20.3	34.8	15.1	26.0	17.0	28.6	23.7	655
Total cost of ownership ***	14.7	19.2	18.3	9.3	15.5	15.1	5.6	11.3	28.6	15.1	416
Standardisation, Knowledge Management											
Quality circle **	44.4	37.9	29.1	30.1	13.7	32.6	13.3	38.9	38.6	35.9	982
Knowledge base systems ***	17.0	21.5	37.9	33.6	22.3	25.6	15.7	19.6	32.9	21.4	578
Working hours, payment schemes											
Flexible work time arrangements ***	61.2	48.1	28.6	48.7	44.8	59.3	43.9	32.1	58.6	52.6	1475
Team performance incentives ***	21.0	19.7	16.0	42.0	23.5	36.0	50.4	40.4	28.6	24.6	684
Human resource management											
Regular individual appraisal interviews ***	59.5	64.7	79.0	63.3	82.9	24.4	48.0	31.8	45.7	61.6	1731
Training programmes ***	35.6	40.8	55.2	65.1	34.5	55.8	29.0	71.2	45.7	41.2	1154
Teleworking ***	19.6	17.4	36.1	4.1	55.5	12.8	29.8	7.5	14.3	23.8	663

source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest value per line; variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

Table 27 shows a general overview of the diffusion of selected organisational concepts among nine European countries. From an overall perspective, the use of organisational concepts in the field of work organisation such as teamwork or the integration of mere operative and planning/controlling tasks in production is most widespread. Particularly, teamwork in production and task integration have been both widely diffused among European firms with around 50 to 75 % share of users. The same accounts for concepts like flexible working time arrangements or regular individual appraisal interviews. In contrast, organisational concepts that can be summarised under the fields of “organisation of production”, “standardisation and knowledge management” are

somewhat less deployed across the considered countries and suggest still unexploited potentials of usage.

Depending on the individual organisational concept considered, the findings, however, show the presence of a more or less substantial cross-country variability. Firstly, Denmark shows a strong overall orientation towards the deployment of organisational concepts. The highest user rates of the concepts “task integration”, “regular individual appraisal interviews”, and “teleworking” point to a participative, employee-oriented culture of leadership and management. In contrast, the field of standardisation and knowledge management seems to play a less important role for Danish firms compared to other countries like the Netherlands or France. In Germany, the high user rate of quality circles and flexible working time arrangements (e.g. multiple-layer systems, working hour accounts) might be due to the importance of the automotive industry whose manufacturing processes rely strongly on these organisational concepts. Last but not least, in the case of Spain, there is high prevalence of personnel training programmes as a special function in human resource management. This could be interpreted in different ways. Either the qualification level of the workforce available on the labour market does not meet the requirements of the firms due to the lack of a formal job specialisation in terms of a dual education system, or, as a second possibility, the firms are interviewed characterised by a culture of lifelong learning. Furthermore, Croatian and Slovenian firms report the highest user percentage of teamwork in production by far, which is surprising compared to traditional “team-work countries” such as Germany, France, Denmark or Finland. Moreover, organisational concepts like cross-functional project teams, shop floor segmentation and total cost of ownership also show the highest diffusion rates for Slovenia. These somewhat surprising findings, however, might be due to the fact that a specific “high-tech” bias towards highly innovative firms in the Croatian and the Slovenian subsample cannot be excluded in comparison to official data from EUROSTAT. With regard to the later multivariate econometric modelling, this means that we will have to monitor country dummies.

To conclude, the strategic or competitive value of the use of organisational concepts has been widely realised across the European countries considered, resulting in more or less comparable numbers of users. Differences in the user ratios might be due to the specific, historically grown industrial structure and leadership culture, shaping individual (Abramson et al. 1993; Min Chen 2004; Adler 1997) and organisational (Hofstede 1984, 1991; Pavlica/Thorpe 1998) behaviour, cognitive perception and leadership (Barsoux/Lawrence 1990). For instance, Pavlica and Thorpe (1998) revealed that British managers tend to emphasise the need for continual development of work skills, and saw the manager as a communicator among a diverse set of people. In contrast, Czech managers do not put much value on staff development and de-emphasised the needs of others at work. They tend to see subordinates as incompetent or even lazy and hold the view that the manager is a dominant male. Moreover, Raghuram et al. (2001) have explored whether national cultures affect the approach of companies towards flexible working structure. Applying the framework of Hofstede (1984, 1991), to a number of countries, they showed that in countries characterised by both a high level of individualism and low power distance (e.g. Scandinavian countries) there appeared to be greater willingness to explore concepts of flexible working such as teleworking. In turn, countries with a high uncertainty avoidance, high power distance and low individualism might face confusion or even conflicts when using flexible working arrangements.

This suggests that cultural characteristics of the national innovation system are likely to impact the choice of flexible working concepts apart from national stereotyping.

As we do not have the possibility to examine different innovation systems' cultural settings on the basis of our data, we would like to focus our analysis on that level where the decisions are made to use and implement an organisational concept or not: the firm level. Different organisational concepts fit differently into strategic innovation paths of firms. An organisational concept like the integration of planning and controlling tasks on the operative level only makes sense if the corresponding product characteristics, production strategy and the qualification structure of employees leave enough room for implementing this concept in a reasonable way. Therefore, we would like to explore certain firms' characteristics and analyse how they shape or do not shape the use of selected organisational concepts.

4.2.8 Use of selected organisational concepts by the most important competitive factor

The argument of the interrelationship of a firm's competitive strategy and its use of organisational concepts is immediately taken up by the following table (28). It summarises the use of the selected organisational concepts according to the most important competitive factor of the firm to demarcate itself against competitors on the market differentiating along six different competitive factors which range from price and quality, via leadership with innovative products, product customisation, and adherence to (short) delivery times to the offer of product-related services.

Table 28: Use of organisational concepts by the firms' major competitive factor

	Major competitive factor						Total	N
	Product price	Product quality	Innovative products	Customization to customers' demands	Adherence to delivery times/ short delivery times	Service		
	%	%	%	%	%	%	%	
<i>Organisation of work</i>								
Teamwork in production	59.1	65.7	64.8	64.1	64.0	74.6	64.1	1591
Task integration	54.2	55.2	63.2	56.4	56.8	50.0	56.1	1376
Temporary cross-functional project teams ***	41.4	45.3	61.0	49.4	42.1	50.0	46.8	1147
<i>Organisation of production</i>								
Shop floor segmentation ***	34.3	31.3	44.4	35.0	35.3	44.3	34.5	847
Internal zero-buffer principle	22.2	22.5	30.3	26.7	26.5	21.0	24.2	592
Total cost of ownership **	11.6	16.5	19.3	14.4	12.4	11.3	15.0	364
<i>Standardisation, Knowledge Management</i>								
Quality circle **	30.2	37.9	41.8	37.2	33.7	33.9	36.3	872
Knowledge base systems **	17.0	21.4	26.0	23.3	26.1	25.4	21.7	517
<i>Working hours, payment schemes</i>								
Flexible work time arrangements **	46.8	51.7	50.2	58.5	55.6	54.7	52.0	1284
Team performance incentives	24.4	24.3	26.8	22.7	32.3	25.0	24.9	611
<i>Human resource management</i>								
Regular individual appraisal interviews ***	60.1	62.8	72.2	57.9	63.4	56.3	62.3	1543
Training programmes **	39.4	43.2	50.4	37.0	38.4	47.6	41.9	1033
Teleworking	23.1	23.1	31.1	22.8	28.7	27.0	24.4	600

source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest value per line; variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

The results indicate that only some of the organisational concepts considered are significantly related to a certain competitive strategy. Most strikingly, the competitive strategy of innovation leadership with new products is frequently accompanied by the use of temporary cross-functional teams, shop floor segmentation, total cost of ownership, quality circles, regular individual appraisal interviews as well as training programmes. This indicates that organisational concepts from different functional areas might serve as an enabler and prerequisite of the product innovativeness of firms. Likewise, the strategy of product customisation might be promoted by a firm's ability to flexibly organize its workforce, for instance by the use of flexible working time arrangements.

But regarding the fact that these organisational concepts are also used by relevant shares of firms pursuing other competitive strategies underlines that the use of an organisational concept is not necessarily linked to a sole competitive strategy. Obviously, the linkage between organisational concepts and their intended outputs and economic benefits is even more complex. For instance, organisational concepts like teamwork in production, task integration or teleworking show no statistically significant relationship to a certain competitive orientation. This is closely in line with the previous findings of Armbruster et al. 2007, who showed that one and the same organisational concept of, for instance, temporary cross-functional teams can be considered as a main driver for enhancing the product innovativeness, flexibility, quality or efficiency of firms. Which of these output dimensions is primarily triggered by the respective organisational innovation depends on its individual implementation within the firm. Hence, the results suggest that basically all of these organisational concepts can, according to their kind of implementation, be more or less useful in the context of more than one competitive strategy.

4.2.9 Use of selected organisational concepts by firm size

As already assumed before, organisational innovation and thus the use of organisational concepts is very likely to be affected by economies of scale resulting in higher numbers of users among large enterprises. As the following table (29) shows, this assumption is strongly supported by the descriptive analysis. There is a strong positive relationship between firm size and all of the considered organisational concepts. The strength of this relationship, however, varies across different organisational concepts. For instance, the share of users of teamwork is only about 17 % higher for large firms with more than 250 employees than for small firms. In contrast, the user share of cross-functional project teams is more than 50 % higher for larger firms, which appears quite reasonable because larger firms are characterised by a higher degree of functional differentiation, allowing for higher potentials of cross-functional teams. But also quality circles, internal zero-buffer principles, and regular individual appraisal interviews show a considerable firm size correlation.

Table 29: Use of organisational concepts by firm size

	Firm size				N
	20 to 49	50 to 249	250 and more	Total	
	%	%	%	%	
<i>Organisation of work</i>					
Teamwork in production ***	56.9	67.2	73.5	63.9	1786
Task integration ***	47.1	57.6	72.7	55.4	1527
Temporary cross-funtional project teams ***	28.1	50.0	81.4	45.5	1252
<i>Organisation of production</i>					
Shop floor segmentation ***	25.6	36.5	53.4	34.4	947
Internal zero-buffer principle ***	13.9	25.3	46.3	23.5	646
Total cost of ownership ***	8.9	16.7	28.6	15.1	412
<i>Standardisation, Knowledge Management</i>					
Quality circle ***	23.4	40.7	57.8	36.1	977
Knowledge base systems ***	15.6	22.5	34.1	21.3	570
<i>Working hours, payment schemes</i>					
Flexible work time arrangements ***	44.8	56.1	63.7	52.6	1462
Team performance incentives ***	17.1	25.8	42.1	24.5	674
<i>Human resource management</i>					
Regular individual appraisal interviews ***	50.7	65.0	81.2	61.4	1711
Training programmes ***	32.8	42.5	61.9	41.2	1143
Teleworking ***	19.7	23.8	32.6	23.4	646

source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest value per line

variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

Firstly, referring to the output side of organisational innovation, these results indicate that larger firms seem to have generally more options for undertaking organisational innovation, because a certain number of organisational concepts require a minimum firm size.

Secondly, the economic benefits obtained by organisational concepts might be considerably higher in large firms due to economies of scale. To provide an example, the quality-enhancing effects of quality circles are probably multiplied by each additional circle in the production line while the additional implementation and coordination costs of any further circle are more or less stable. Moreover, large firms have the opportunity to test a new organisational concept, assess its benefits in a more or less isolated, peripheral area of their production and thereby reduce the uncertainty about the outcomes of a new organisational concept. In contrast, especially small firms do not have this possibility without instantly changing the layout of their core processes. Thus, the perceived uncertainty of the possible economic outcome of an organisational innovation as well as the risk of implementation and the consequences in case of failure are higher for smaller firms.

Finally, considering the input side, larger firms might have information advantages about new or relevant organisational concepts because of their higher number of interfaces with external partners and their frequently higher number of highly skilled employees. Providing a first hint concerning the prevalence of a size-related systemic failure, this aspect will be revisited below in

the analysis of important knowledge and information sources of organisational innovation as well as the role of highly skilled employees.

However, the impact of firm size has to be qualified when the concrete implementation of an organisational concept is taken into account. How the concrete implementation of an organisational concept can moderate the impact of firm size is presented in an exemplarily way on the basis of teamwork by the following table (30). While the wider definition just asks firms whether they do deploy teamwork in production or not, the narrow definition investigates the use of "high-quality" teamwork, which is ideally characterised by a team size of 3 to 15 persons, an integration of planning and quality controlling tasks, and a homogeneous level of qualification/skills of all team members. First of all, it can be stated that the user ration dramatically decreases by approximately 40-50 % when asking about the narrow definition of teamwork. With just around one fifth of users, one still cannot speak about a comprehensive diffusion of such high-quality teamwork in Europe.

Table 30: Use of teamwork (wide and narrow definition) by firm size

	Firm size				N
	20 to 49	50 to 249	250 and more	Total	
	%	%	%	%	
Use of teamwork in production (wide definition)	57.3	64.3	71.5	63.0	1019
Use of teamwork in production (narrow definition)	19.6	23.9	16.3	21.2	322

source: EMS 2009, Fraunhofer ISI, own calculations

narrow definition = team size between 3 to 15 employees, planning and quality control are part of the team's responsibility, all team members are qualified to do all tasks

Secondly and most interestingly, high-quality teamwork can now be primarily found in medium-sized firms. Even small firms with less than 50 employees show a higher user share than very large enterprises. Hence, the generally lower levels of hierarchy in smaller and medium-sized firms seem to favour this high-quality type of teamwork and might in this case even cause disadvantages of size. Anyway, this example highlights the issue that activities in organisational innovation are highly dependent on their individual kind of implementation, organisational context and embeddedness.

In the context of organisational innovation, it is evident to also consider how firm size affects the early introduction of organisational concepts (table 31). For this purpose, the users of organisational concepts were further divided into "early birds" and "latecomers". The group of early birds includes those firms who were among the first 10 % of all today's users who have introduced the respective organisational concept. On the contrary, the group of latecomers consists of those firms who are among the last 25 % of all users to introduce the organisational concept. The groups were built based on the mentioned year of the first introduction of an organisational concept. Because of small case numbers, only a reduced set of organisational concepts is reported in the table.

Table 31: Early birds and latecomers in the use of organisational concepts by firm size

	Firm size				N
	20 to 49	50 to 249	250 and more	Total	
	%	%	%	%	
<i>Teamwork in production</i>					
early birds **	10.3	8.0	13.5	9.7	145
latecomers	23.6	26.0	18.8	24.0	359
<i>Task integration</i>					
early birds	11.3	9.1	11.4	10.3	139
latecomers	26.8	26.2	16.3	24.6	333
<i>Temporary cross-funtional project teams</i>					
early birds	9.5	6.8	11.0	8.5	95
latecomers	28.9	29.9	19.9	27.1	302
<i>Shop floor segmentation</i>					
early birds	7.3	10.4	8.8	9.2	77
latecomers	24.2	27.9	21.0	25.3	213
<i>Quality circle</i>					
early birds **	9.9	8.9	15.4	10.6	93
latecomers	29.7	25.3	15.9	24.4	214
<i>Flexible work time arrangements</i>					
early birds	10.5	10.4	12.3	10.7	136
latecomers	27.2	21.7	16.1	22.6	287
<i>Regular individual appraisal interviews</i>					
early birds **	10.8	7.8	13.4	9.8	149
latecomers	21.2	27.1	13.8	22.7	345
<i>Training programmes</i>					
early birds **	10.7	5.3	7.6	7.4	72
latecomers	21.4	24.1	21.7	22.8	221

source: EMS 2009, Fraunhofer ISI, own calculations

bold = highest values

early birds = firms who belong to the group of the first 10 % that have introduced an organisational concept

latecomers = firms who belong to the group of the latest 25 % that have introduced an organisational concept

variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

The findings reveal that there is an almost pervasive advantage for large firms in the early adoption of organisational concepts (e.g. teamwork, quality circle, regular individual appraisal interviews), while small or medium-sized firms can be found more often in the group of latecomers. The only concept which is significantly adopted earlier by smaller firms is the establishment of personnel training programmes as a special function in human resources management. With regard to the concept of quality circles, which is more frequently used by firms pursuing an innovation leadership strategy, it could also be assumed that large firms are able to profit from their size advantage not only in terms of higher quality, but also with regard to the positive side effects of quality circles to the development of incremental product innovations. Furthermore, quality circles might also help to

cope with quality issues arising from product innovation and the necessary set-up of new, unstable or non-standardised production processes.

Nevertheless, in the case of task integration of temporary cross-functional teams, the influence of firm size is not as prominent as on their mere user shares. Regarding these concepts, especially small firms seem to have the comparable ability to identify them early and implement them as large firms do

To conclude, there are signs of evidence that larger firms with more than 250 employees are more likely to be pioneers in the use of organisational concepts than small and medium-sized enterprises. However, the impact of firm size is not linear and pervasive throughout all the concepts considered here. Additionally, it should be mentioned here that the actual role of firm size for the use of organisational concepts cannot be estimated on the basis of simple descriptive statistics. To clarify this point, firm size will be self-evidently integrated in the later multivariate regression models.

4.2.10 Use of selected organisational concepts by the R&D intensity of firms

Earlier in this report, it has been argued that organisational innovation as a non-technical dimension of innovation activities might be less or even not interrelated with the firm's R&D-intensity. However, as the analysis of the major competitive factors showed, a higher user level of organisational concepts came along with a strategic orientation towards innovation leadership in the market.

Table 32 depicts that the majority of the selected organisational concepts show significantly higher user rates in very R&D intensive firms with more than 7 % share of R&D expenditures. This underlines the previous findings that organisational innovation activities are rather complementary to other, technology-oriented innovation strategies than substitutes (Som et al. 2010; Rammer et al. 2012; Som 2012). The results, however, do not suggest a linear relationship between organisational activities and R&D intensity as the user percentages of firms with medium and high R&D intensity are frequently quite close to each other. Instead, the line of demarcation is more likely to run along the split between non-R&D-intensive firms and firms with medium or high R&D intensities. Moreover, the relationship between the use of organisational concepts and a firm's R&D intensity might further be moderated by additional aspects like the complexity of products or the share of highly skilled employees. R&D intensive firms tend to manufacture products with higher complexity (Som et al. 2010; Som 2012) which in turn require corresponding organisational concepts to handle their complexity, for instance via cross-functional teams, quality circles, or knowledge-based systems. Likewise, a higher share of highly skilled employees induces an increased need for corresponding concepts like flexible working time arrangements, individual appraisal interviews or individual job training programmes (Som 2012).

Table 32: Use of organisational concepts by firms' R&D intensity

	Classification of R&D expenditure				
	non-R&D- intensive firms	firms with medium R&D- intensity	very R&D- intensive firms	Total	
	%	%	%	%	N
<i>Organisation of work</i>					
Teamwork in production ***	60.7	67.8	67.4	<div><div></div></div> 62.8	1441
Task integration ***	49.4	64.9	63.7	<div><div></div></div> 54.0	1220
Temporary cross-funtional project teams ***	37.5	59.7	68.0	<div><div></div></div> 45.2	1018
<i>Organisation of production</i>					
Shop floor segmentation ***	30.2	42.7	40.5	<div><div></div></div> 33.8	762
Internal zero-buffer principle ***	18.0	29.5	31.2	<div><div></div></div> 21.7	487
Total cost of ownership ***	11.8	18.7	26.0	<div><div></div></div> 14.7	329
<i>Standardisation, Knowledge Management</i>					
Quality circle ***	33.9	49.5	51.5	<div><div></div></div> 38.9	860
Knowledge base systems ***	18.0	27.4	30.9	<div><div></div></div> 21.3	464
<i>Working hours,payment schemes</i>					
Flexible work time arrangements ***	51.0	60.1	59.7	<div><div></div></div> 53.7	1224
Team performance incentives	23.7	29.2	25.4	<div><div></div></div> 24.9	562
<i>Human resource management</i>					
Regular individual appraisal interviews ***	53.7	66.5	72.5	<div><div></div></div> 58.3	1330
Training programmes ***	39.0	49.2	49.2	<div><div></div></div> 42.1	956
Teleworking ***	16.4	23.9	31.6	<div><div></div></div> 19.6	443

Source: EMS 2009, Fraunhofer ISI, own calculations













bold = highest value

non-R&D-intensive firms = less than 2.5 % share of R&D expenditures / firms with medium R&D-intensity = between 2.5 and 7 % share of R&D expenditures / very R&D-intensive firms = more than 7 % share of R&D expenditures

variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

Hence, in contrast to size, the R&D intensity of a firm says only little about whether the firm belongs to the group of early birds or latecomers as regards the introduction of organisational concepts. Looking again at the early adopters or latecomers of certain organisational concepts (table 33), it becomes apparent that non-R&D-intensive firms are not necessarily isolated from information about new and useful organisational concepts. Nevertheless, there seems to be a high heterogeneity within the non-R&D-intensive firm group as it also most frequently contains the highest share of latecomers.

Table 33: Early birds and latecomers in the use of organisational concepts by firms' R&D intensity

	Classification of firms' R&D-intensity				
	non-R&D-intensive firms	firms with medium R&D-intensity	very R&D-intensive firms	Total	
	%	%	%	%	N
<i>Teamwork in production</i>					
early birds	10.9	8.9	6.1	 9.9	120
latecomers	21.6	17.4	21.1	 20.6	251
<i>Task integration</i>					
early birds	10.7	10.6	6.0	 10.1	111
latecomers	26.9	18.4	22.1	 24.3	268
<i>Quality circle</i>					
early birds	9.7	11.6	11.4	 10.4	82
latecomers	25.5	23.2	19.5	 24.0	189
<i>Knowledge base systems</i>					
early birds	10.0	8.7	16.4	 10.7	45
latecomers	24.3	18.3	28.4	 23.5	99
<i>Flexible work time arrangements</i>					
early birds	11.8	10.0	8.0	 10.9	119
latecomers	22.4	21.3	18.1	 21.6	235
<i>Regular individual appraisal interviews</i>					
early birds	9.4	9.1	11.0	 9.5	114
latecomers	24.0	25.9	18.0	 23.5	281

Source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest value per line

early birds = firms who belong to the group of the first 10 % that have introduced an organisational concept

latecomers = firms who belong to the group of the last 25 % that have introduced an organisational concept

variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

4.2.11 Use of selected organisational concepts by production characteristics

As mentioned in the last paragraph, the characteristics of the firms' production system could also be expected to influence the propensity to use certain organisational concepts. For instance, it can be assumed that manufacturing in large batch sizes requires a different organisational setting than single unit production in terms of standardisation, segmentation or task integration. Therefore, the following tables 33 and 34 present cross tabulations between the user rates of organisational concepts and the firms' average batch size and product complexity.

To start with the average batch size (table 34), it can be seen from the table below that large batch sizes are associated with higher user percentages in the fields of standardisation and knowledge management as well as the organisation of production. However, single unit production and small

or medium batch sizes are almost not linked with specific organisational concepts. Along with small or medium batches it seems that some minor advantages of flexible time arrangements in the context of single unit production exist, as well as for zero-buffer principles and task integration. In summary, it can be stated that the use of an organisational concept, except for the area of standardisation and organisation of production, is not strongly linked to a certain batch size.

Table 34: Use of organisational concepts by average batch size

	Batch size				
	Single unit production	Small/ medium	Large	Total	
	%	%	%	%	N
<i>Organisation of work</i>					
Teamwork in production	62.9	65.2	63.5	<div><div></div></div> 64.2	1645
Task integration ***	50.8	59.7	53.3	<div><div></div></div> 55.9	1413
Temporary cross-funtional project teams **	43.1	46.8	50.6	<div><div></div></div> 46.5	1174
<i>Organisation of production</i>					
Shop floor segmentation **	29.5	35.3	35.5	<div><div></div></div> 33.7	851
Internal zero-buffer principle **	22.4	25.8	20.0	<div><div></div></div> 23.7	596
Total cost of ownership ***	12.2	15.8	19.4	<div><div></div></div> 15.5	386
<i>Standardisation, Knowledge Management</i>					
Quality circle ***	27.9	39.7	43.0	<div><div></div></div> 37.0	920
Knowledge base systems	19.6	21.0	24.2	<div><div></div></div> 21.2	520
<i>Working hours,payment schemes</i>					
Flexible work time arrangements	55.6	54.6	49.1	<div><div></div></div> 53.8	1374
Team performance incentives ***	18.1	24.7	27.2	<div><div></div></div> 23.3	590
<i>Human resource management</i>					
Regular individual appraisal interviews	59.1	63.2	64.2	<div><div></div></div> 62.2	1590
Training programmes	39.6	40.3	45.7	<div><div></div></div> 41.2	1047
Teleworking	25.1	23.7	22.2	<div><div></div></div> 23.8	604

source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest value per line

variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

Proceeding to product complexity reveals a different picture (table 35). In the large majority of concepts there is a close relationship between their frequency of use and the corresponding product complexity of the firm. The higher the complexity of the manufactured products, the higher the share of users. This reflects the greater need for organisational concepts and solutions to handle the high complexity efficiently and economically reasonable. To give an example, the development and manufacturing of a highly complex product like a machine tool requires multiple experts from different disciplines like mechanical engineering, optics, software engineering, (micro-electronics or material sciences in terms of a cross-functional project team. Similarly, a higher complexity of a product also benefits from an integration of planning or controlling tasks on the operative level of production, because a segmentation of these tasks after each step of production would cause high, disproportional quality costs. Instead, the worker who is assembling the product knows best about the specific criteria of quality. In contrast, the manufacturing processes of simple

products (e.g. metal screws or plastic parts) can be highly automated and standardised: this applies likewise to their quality control.

Table 35: Use of organisational concepts by product complexity

	Product complexity			Total	
	Simple products	Medium complexity	Complex products	%	N
	%	%	%		
<i>Organisation of work</i>					
Teamwork in production ***	54.2	65.4	68.4	63.9	1660
Task integration ***	42.0	58.0	62.2	55.9	1433
Temporary cross-functional project teams ***	31.2	45.2	59.2	46.4	1189
<i>Organisation of production</i>					
Shop floor segmentation ***	24.9	35.0	38.0	33.8	865
Internal zero-buffer principle ***	13.2	24.4	29.6	23.6	603
Total cost of ownership ***	10.8	15.2	19.2	15.5	392
<i>Standardisation, Knowledge Management</i>					
Quality circle ***	29.8	36.7	42.4	36.9	929
Knowledge base systems ***	15.6	21.2	27.1	21.8	541
<i>Working hours, payment schemes</i>					
Flexible work time arrangements ***	46.2	53.8	58.3	53.6	1386
Team performance incentives	22.9	23.4	23.4	23.3	597
<i>Human resource management</i>					
Regular individual appraisal interviews ***	51.7	63.8	67.7	62.4	1616
Training programmes ***	34.8	40.3	48.3	41.5	1069
Teleworking ***	19.6	23.9	27.4	24.1	618

source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest value per line

variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

Moreover, this picture is also confirmed by the analysis of the early birds who are among the first 10 % of firms to introduce an organisational concept. It can be seen that firms with highly complex products are more likely to belong to the group of first movers, as these concepts address their specific requirements and problems, like task integration, temporary cross-functional teams, flexible working time arrangement or regular individual appraisal interviews.

4.2.12 Use of selected organisational concepts by a share of highly skilled employees

Similarly to the complexity of products, the need for the deployment of organisational concepts might also be increasing with a higher share of highly-skilled employees with tertiary education, because they ask for attractive job conditions (e.g. training programmes, individual appraisal

interviews, team performance incentives) and enlarged areas of responsibility (e.g. task integration) and work typically in more complex tasks. However, the relationship could also be thought of the other way round by arguing that the development, implementation and adaption of organisational concepts, particularly in the fields of organisation of work or production, is very knowledge-intensive and thus requires a certain number of highly skilled personnel.

Table 36: Use of organisational concepts by a share of highly skilled employees

	Share of highly qualified employees				N
	Lower tiers	Medium tiers	Higher tiers	Total	
	%	%	%	%	
<i>Organisation of work</i>					
Teamwork in production	58.6	63.3	64.5	62.3	1352
Task integration ***	47.1	56.0	61.4	55.1	1181
Temporary cross-funtional project teams ***	27.0	49.6	60.1	46.2	989
<i>Organisation of production</i>					
Shop floor segmentation ***	27.4	35.8	38.6	34.2	733
Internal zero-buffer principle ***	14.7	22.5	29.8	22.4	478
Total cost of ownership ***	10.4	15.6	20.3	15.5	329
<i>Standardisation, Knowledge Management</i>					
Quality circle ***	30.0	43.5	44.0	39.7	836
Knowledge base systems ***	14.6	20.7	25.3	20.4	422
<i>Working hours, payment schemes</i>					
Flexible work time arrangements ***	47.0	57.7	54.0	53.3	1155
Team performance incentives ***	19.6	26.3	24.5	23.7	508
<i>Human resource management</i>					
Regular individual appraisal interviews ***	49.1	58.2	68.8	58.9	1276
Training programmes ***	34.4	39.8	47.4	40.6	874
Teleworking ***	14.2	18.4	29.1	20.5	441

source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest value per line; variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

The specificities of different country definition of "highly skilled" employees were taken into account by a country specific ranking

To analyse this relationship, the firms were asked to name their percentage of highly skilled employees as part of all employees. To ensure international comparability, the differences in the countries' definition of "highly skilled" were taken into account by setting up a country-specific ranking before integrating the data. Afterwards, the total firm sample was grouped into three tiers, according to their ranking position. Thus, the firms located in the "highest tier" accordingly show the highest shares of highly skilled employees, and so on.

The previous assumptions are closely reflected in the empirical findings presented in table 36. Those firms having the highest shares of highly skilled employees also show the highest user percentages throughout the majority of organisational concepts. The positive relationship between highly skilled personnel and the use of organisational concepts becomes most prominent in the cases of task integration, total cost of ownership, temporary cross-functional project teams, regular individual appraisal interviews, training programmes and teleworking. Especially the latter underlines the close connection between the formal level of qualification and the requirements in

terms of personal fulfilment, working time flexibility and continuous learning. Additionally innovative organisational concepts might facilitate knowledge-intensive work and therefore be a necessary complement to such tasks.

It would also have been interesting to see whether firms with higher shares of highly skilled employees are more likely to belong to the group of early birds regarding the introduction of organisational concepts. One could for instance assume that higher shares of employees with tertiary education foster the early implementation of certain concepts. Unfortunately, for most of the organisational concepts the case numbers become too small to provide a solid basis for interpretation by means of cross tabulation. For those concepts to remain a sufficient number of cases (table 37), surprisingly, the share of highly qualified employees does not correspond with an early implementation in three out of four concepts.

Table 37: Early birds and latecomers in the use of organisational concepts by firms' share of highly skilled employees

	Share of highly qualified employees				N
	Lower tiers	Medium tiers	Higher tiers	Total	
	%	%	%	%	
<i>Teamwork in production</i>					
early bird, first 10% **	13.4	7.6	7.6	9.1	106
latecomers	22.8	20.3	20.3	20.9	243
<i>Task integration</i>					
early birds	13.2	10.0	7.8	10.0	107
latecomers	29.4	22.7	22.5	24.3	260
<i>Flexible work time arrangements</i>					
early birds	12.7	10.5	10.2	10.9	113
latecomers	29.6	21.7	18.5	22.7	234
<i>Regular individual appraisal interviews</i>					
early birds	8.6	8.9	10.9	9.6	110
latecomers	26.9	23.2	20.9	23.2	267

source: EMS 2009, Fraunhofer ISI, own calculations / bold: highest values

The specificities of different country definition of "highly skilled" employees were taken into account by a country specific classification

variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

On the contrary, the early introduction of the exemplary organisational concepts seems actually to be more likely in firms belonging to that group with the lowest share of highly qualified personnel. But the only significant difference between the three firm groups can be found in the concept of teamwork in production. Due to the limited number of concepts, this finding should not be overinterpreted at this point, however. This finding could be explained with the structures of the manufacturing sector, where the coordination of simple tasks is one of the main organisational challenges. In order to gain additional insight into this phenomenon, the temporal aspect of the concept introduction will again be included in the later multivariate regression analysis.

4.2.13 Participation in innovation collaboration as an dimension organisational innovation

According to the definition of the Oslo Manual, organisational innovation also encompasses the inter-firm extension of working and innovation process to external partners. In this sense, innovation collaboration as a type of organisational innovation helps firms to seize and exploit technologies and knowledge that are available outside the firm to extend or complement their own internal stock of knowledge.

Table 38: Participation in innovation collaboration by firm size

	Firm size			Total	N
	20 to 49	50 to 249	250 and more		
	employees	employees	employees		
	%	%	%	%	
Cooperation in innovation ***	58.3	68.5	84.3	67.1	1295
<i>Innovation cooperation</i>					
with customers	64.8	66.5	66.1	65.9	798
with suppliers **	65.6	68.3	76.4	69.0	836
with competitors	15.3	14.3	17.6	15.3	185
with service providers ***	33.9	40.3	59.2	41.9	508
with research institutes ***	30.7	46.2	70.8	46.1	558

Source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest value per line

variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

* = at least one innovation cooperation with the respective partner

Table 38 clearly reveals that the willingness to participate in innovation collaborations with external partners drastically increases with firm size. While only a little more than the half of the small firms collaborates in innovation projects, this is the case for more than eight out of ten large firms with 250 and more employees. As a consequence, the greater resource basis of large firms seems to cause great advantages in identifying external cooperation partners and successfully managing the knowledge inflows. Looking at the different collaboration partners, however, the picture is slightly different. Most of the firms are working together with partners along the value chain (i.e. customers, suppliers). Making a comparison between the different size groups, it appears remarkable that for customers and suppliers the differences almost vanish. Hence, small firms obviously face no higher structural disadvantages in identifying and profiting from adequate collaboration partners as long as they search more along their value chain than large firms.

The biggest differences between the groups of firms become visible for innovation collaborations with external research institutes and service providers. In the first case, this appears plausible as larger firms tend to have a higher absorptive capacity of external R&D knowledge because of their superior resources in terms of highly skilled employees and R&D expenditures. With regard to service providers like business consultancies, larger firms also possess greater financial resources to afford their knowledge-intensive consultant services. Finally, only a small minority collaborates with competing firms. This seems reasonable due to the similar economic interests to appropriate

the benefits of the innovation collaboration. However, similar to partners in the value chain, smaller firms do not show a significant lower share of innovation collaborations with competitors. Being often more active in local or regional niche markets, smaller firms with fewer amounts of R&D expenditures might benefit from innovation collaboration with competitors, because the collaborating firms are not directly competing with each other in the same local market segment, despite being located in the same industry (Som/Kinkel 2012). Hence, conflicting interests concerning the outcome of the innovation collaboration might be perhaps of less relevance.

Table 39: Participation in innovation collaboration by firms' R&D-intensity

	Classification of firms' R&D-intensity				Total	N
	non-R&D-intensive firms	firms with medium R&D intensity	very R&D-intensive firms			
	%	%	%	%		
Cooperation in innovation ***	59.6	81.2	80.2	66.1		1181
<i>Innovation cooperation</i>						
with customers ***	62.1	72.1	72.5	66.0		729
with suppliers	69.4	70.9	69.0	69.7		770
with competitors	16.1	14.7	10.5	14.9		165
with service providers ***	36.7	47.8	49.1	41.2		455
with research institutes ***	30.5	62.2	74.3	44.4		491

source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest values

non-R&D-intensive firms = less than 2.5 % share of R&D expenditures / firms with medium R&D-intensity = between 2.5 and 7 % share of R&D expenditures / very R&D-intensive firms = more than 7 % share of R&D expenditures

variations between groups tested with Kruskal-Wallis test: significant *** at a 99% level, ** at a 95% level

* = at least one innovation cooperation with the respective partner

Following this argumentation that the R&D-intensity of firms might determine their probability to participate in innovation collaboration, table 39 surprisingly shows that the level of R&D expenditures does not imply a global, straightforward relationship between both dimensions. Nevertheless, very R&D-intensive firms are more likely to collaborate, especially with service providers and research institutes. But as the other partner categories show, a higher R&D-intensity does not necessarily lead to more collaborative activities. In fact, the decision to collaborate in innovation projects seems to be much more related to a certain threshold of R&D-intensity than the differences between the group of non-R&D-intensive firms and firms with medium or high R&D-intensity show. Moreover, the argument of a higher absorptive capacity of very R&D-intensive firms for external R&D knowledge is underlined by the fact that almost three thirds of these firms collaborate with R&D organisations. Likewise, the previously raised point that small and often less R&D-intensive firms are more likely to profit from innovation cooperation with competitors is also stressed by the present findings as they show the highest ratio in this dimension. To summarise, the stimulation of collaborative activities as an external dimension of organisational innovation seems to require a well-differentiated approach depending on which partnerships should be stimulated. With regard to potential market or systemic failures in this field, larger firms with high








levels of resource endowments seem to have structural advantages in participating and profiting from innovation collaboration, particularly with external R&D organisations.

4.2.14 Information and knowledge sources for organisational innovation

Having focused on different levels of use of organisational concepts or innovation collaboration so far, the following two paragraphs will deal with the input side of organisational innovation in terms of firms' most relevant sources of information and knowledge to undertake activities in the field of organisational innovation as well as the firms' participation in collaborations targeted at the development or implementation of an organisational innovation. This opens up a perspective on the innovation systems of organisational innovation on a micro level and helps to identify the channels of diffusion of organisational innovation.

To start with the most important information sources in terms of triggering innovation activities in the field of organisational innovation, table 40 depicts different internal and external information sources which the firms indicated as their most important sources. Generally, the highest importance for organisational innovation activities is across all firms attributed to conferences, trade fairs, and other professional events as an external source. Hence, the necessary information or knowledge about the implementation or benefit of relevant organisational concepts is frequently not available within the firm. Moreover, with conferences and trade fairs being of a highly public character, the shared knowledge or information about organisational innovation will be likely to occur in terms of "best" or "good" practices characterised by the specific situation and characteristics of selected "light-house firms". However, it has been argued before that an organisational innovation always needs to be carefully adapted and implemented according to the firms' own framework conditions to unfold its intended positive effects. This problem becomes even more severe as trade fairs, conferences and professional events are usually targeted at partners along the value chain. However, in the case of organisational innovation, suitable solutions or beneficial concepts and instruments are not necessarily to be found only along value chain relationships. It can be supposed instead that a certain organisational innovation could be relevant for different firms across technological or market boundaries. Thus, a firm located in the food and beverages sector might face similar organisational needs as a furniture or sports equipment manufacturer with the same firm size, product complexity or batch size than another company in the food sector with totally different characteristics in its production processes. Conferences or trade fairs specifically aimed at organisational innovation across value chain contexts, however, are respectively rather scarce or not available.

Table 40: Most important information sources for organisational innovation by firm size

	Firm size			Total	N	
	20 to 49 employees	50 to 249 employees	250 and more employees			
	%	%	%			
Organisational innovation is mainly triggered by...						
...own R&D	19.4	16.2	16.2		17.3	264
...other employees ***	18.0	23.5	29.3		22.7	347
...customers	14.6	13.6	14.7		14.1	216
...suppliers	10.8	11.0	14.3		11.5	176
...competitors	13.6	13.6	18.5		14.5	221
...research organisations ***	9.2	17.4	31.3		17.1	261
...professional events	36.9	37.0	37.5		37.0	566

source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest value; significant variation between groups based on Kruskal-Wallis test *** at a 99% level, ** at a 95% level

maximum three indications were allowed

Smaller firms especially seem to have less access to external knowledge resources for their organisational innovation activities which, in consequence, could point to a lower perceived strategic importance of organisational innovation by these firms to date. Monitoring the firms' share of highly skilled employees, it becomes apparent that particularly firms with a lower share of highly qualified personnel rely on trade fairs and conferences as the major source of information for organisational innovation. With publically available knowledge and information being by far the most important source for organisational innovation, this might indicate some kind of a systemic failure in terms of a lack of sufficient knowledge about the adaption and implementation of organisational concepts to the given requirements of the one's own firm. In consequence, there the risk that the beneficial potential inherent in some organisational concepts remains systematically unexploited or at least suboptimal could exist.

Apart from that, larger firms do rely more closely on knowledge from external research units when it comes to organisational innovation than smaller firms. Thereby, it can be assumed that the necessary adaption and implementation processes of a new organisational concept are coordinated and accompanied by the research organisation. Hence, larger firms might have structural advantages in the adequate external sourcing of relevant information and knowledge of organisational innovation. Bigger firms also make greater use of their internal knowledge base in terms of their own employees than possible for smaller firms because of their restricted human resources. Interestingly, small firms with less than 50 employees most frequently mention their internal R&D department as an important source of organisational innovation.

Moreover, the in-house R&D department is even more frequently mentioned as a relevant knowledge source for organisational innovation by firms with a very high R&D intensity (i.e. more than 7 % share of R&D expenditure). This finding is quite surprising because organisational innovation is usually assumed not to be primarily rooted in the R&D department of a firm. This could be interpreted in various ways. Firstly, this could point to a certain level of knowledge intensity that is required to realise and implement organisational innovations, because, particularly

in small companies, the R&D department usually represents the area where most of the highly skilled employees can be found. Secondly, organisational innovations that originate in the R&D department can be assumed to be linked with the requirements of new technical processes or product innovations (e.g. segmentation of production, quality circles, and knowledge management systems). In consequence, organisational innovations that aim to improve social aspects or the quality of work (e.g. training programmes, flexible working hour accounts, and individual appraisal interviews) might be neglected in this way.

Another important strategy for performing organisational innovation activities lies in collaboration with external partners. Similar to the descriptive analysis of the firms' participation in innovation cooperation, the firms were asked about different external partners with whom they might collaborate in the field of organisational innovation (table 41).

Table 41: Collaboration on organisational innovation by firm size

	Firm size				N
	20 to 49 employees	50 to 249 employees	250 and more employees	Total	
	%	%	%	%	
Participation in cooperation on organisational innovation ***	15.8	26.1	48.8	25.7	491
Cooperation on organisational innovation with...					
...customers ***	26.5	12.2	9.0	14.5	66
...suppliers **	22.5	15.4	10.5	15.6	71
...competitors	5.9	7.2	8.3	7.2	33
...service providers	58.8	64.3	68.4	64.3	293
...research organisations ***	12.7	20.8	41.4	25.0	114

source: EMS 2009, Fraunhofer ISI, own calculations

bold: highest value; significant variation between groups based on Kruskal-Wallis test *** at a 99% level, ** at a 95% level

percentages represent the share of firms who are at least participating in one collaboration with the external partner

As the results show, firms are generally rather reluctant to cooperate in the field of organisational innovation. Only about one fourth of all firms mentioned collaboration in the field of organisational innovation while in the case of general participation in innovation collaboration across all types of innovation this share was around 66 percent. Nevertheless, the overall probability of collaboration in organisational innovation again greatly increases with firm size. Thus, almost the half of firms with more than 250 employees state that they collaborate with external partners in organisational innovation projects. Similar to innovation cooperation in other fields, the willingness or ability to collaborate in organisational innovation projects is strongly related to firm size. As a consequence of this rather low number of collaborating firms, the case numbers regarding different external partners melt down drastically. Hence, the findings presented in the table should be interpreted carefully. Nevertheless, they provide an idea where external partners are recognised as carriers of important or complementary knowledge for realising organisational innovation projects.

Not very surprisingly, external service providers such as business consultancies are the most frequent collaboration partners for all sizes of firms. With regard to larger firms, external research organisations also play an important role not only as an information source but also as a

collaboration partner when it comes to the realisation of an organisational innovation. In contrast, small firms also rely on partners along their value chain (i.e. customers, suppliers) in the realisation of organisational innovation projects. In the case of customers, however, it can be assumed that the "collaboration" in the field of organisational innovation is not always of a voluntary nature, because large companies expect their small supplying firms to implement certain organisational concepts to meet their specifications and logistic requirements (e.g. quality systems, just-in-time delivery, document-related management systems).

From the perspective of this study, one has to ask for the reasons of the firms' reluctance to collaborate in organisational innovation projects. One reason could be that firms do not perceive the need or intentionally avoid collaborating in this field, because they fear their internal processes may be revealed to external partners and that thereby they might lose their competitive advantage. Secondly, and this would point to the perspective of systemic failures, firms could either be confronted with a lack of adequate collaboration partners for organisational innovation or with missing information about possible partners. Finally, another possible explanation of this finding could be that in contrast to technological innovation, organisational innovation directly refers to the heterogeneous nature of firms' structures, strategies, routines, and processes. As previous results have shown, these aspects might be considerably moderated by firm size, as smaller enterprises cooperate less with external partners. As these questions could not be assessed sufficiently via quantitative analysis, they will be addressed in the qualitative analysis of firms' case examples presented in the corresponding chapter.

4.2.15 Determinants of the use of selected organisational concepts – empirical evidence from multivariate regression analyses

This subchapter is connected to the previous descriptive analyses by providing multivariate econometrics on the correlations between certain firms' characteristics and the probability of a firm deploying an organisational concept. In order not to get lost in the vast amount of multivariate models, we decided to focus on four exemplary organisational concepts that cover different firm-internal dimensions towards which organisational innovation can be targeted. These concepts are:

- **Task integration:** this organisational concept belongs to the field of procedural work organisation and describes the integration of planning, controlling or monitoring tasks at the operational workbench level in contrast to Tayloristic work organisation which strictly makes a separation between "head and hand".
- **Shop floor segmentation:** belonging to the field of structural production organisation, this concept describes the segmentation of production into customer or product-specific lines or cells in the factory.
- **Quality circles:** this concept represents the strand of organisational concepts or management tools that aim at increasing quality levels in the production such as continuous improvement processes (CIP) or total quality management (TQM). By establishing and institutionalising formal and informal routines and procedures to secure

and increase quality of product and processes, quality circles belong to the field of standardisation.

- **Knowledge-based systems:** this concept is targeted towards the development and establishment of systematic processes to accumulate and management the internal knowledge stocks of the firm, and thereby to secure the benefits of organisational learning. Knowledge management systems represent one of the most prominent examples. They aim to de-couple knowledge from individual persons to make it available throughout the whole firm in terms of codified knowledge.

For analysing the differences in probability that firms use or do not use an organizational concept according to various factors, multiple logistic models are applied. For each organisational variable we estimated a basis model in the first step containing structural variables of the firm. Corresponding to the descriptive analysis, the basis models monitor:

- Country, differentiating Austria, Netherlands, France, Denmark, Croatia, Spain, Slovenia in comparison to Germany (nominal)
- Sector affiliation, differentiating 10 sector groups compared to machinery sector (nominal)
- Firm size, operationalised using the number of employees transformed with the natural logarithm to take into account a declining influence
- Product complexity, comparing firms with simple and medium complex products to firms producing complex products
- Average batch size, comparing single unit and small batch productions to large batch productions, and
- Prior competitive strategy, differentiating firms which assess product innovation as their most important competitive factor from firms with other priorities

Table 42 displays the details of these four basis models. For all models, the model fit is tested by the omnibus test of the model coefficients, which shows that the considered concepts have significantly increased the prediction of the use of the concepts. Together with the respective Log-Likelihood values, two R² are also displayed for roughly assessing the power of the models.

The Odds ratio is a measure of effect size in logistic regression. It describes the strength of association or non-independence by providing information about the statistical chance (probability) as to whether the concept is adopted or not on the basis of the explanatory variable. It ranges between 0 and ∞ , it indicates that the odds of using the concept changes by the factor as displayed, depending on the influencing variables. Hence, values smaller than “1” describe a lower chance of using the concept (negative relationship), and values above “1” describe a higher chance of using the concept than the reference group has

Starting with the findings from the basis models dealing with structural variables of the firms (table 41), the results show some similarities but also some differences between the four organisational

concepts considered. Regarding the correlations of **nationally grown structures of culture, organisational behaviour and leadership** represented by the country variables, it is shown that considering country variables is important for all four models. With Germany being included as the reference country, the findings show the probability of firms in each respective country using a certain organisational concept - on condition that they show the same characteristics as German firms. For instance, if Danish firms have equal characteristics as the German reference firms, they would nevertheless have significantly higher probabilities of making use of three of the four organisational concepts, in particular of task integration and knowledge-based systems. Thus, the use of the considered organisational concepts correlates significantly with countries' national peculiarities, for instance in terms of leadership and working culture. In the context of policy support for organisational innovation, these findings underline the necessity that cultural aspects of individual and organisational behaviour, as well as historically grown interpretations of management and leadership, should be taken into account.

Similar findings can be stated for **different industries**. In general, the firm's sector is an important factor for explaining the use or non-use of a certain organisational concept. For instance, task integration shows a significantly lower chance of being deployed in traditional, rather non-R&D-intensive industries like food, textiles or paper industry, compared to the chance of being used in machinery. As already suggested by Som et al. (2010), Rammer et al. (2011) or Som (2012), this might be due to the less complex structure of working processes and working content in these sectors as well as the high level of automation and standardisation of process goods manufacturing, neither of which leave much room for the integration of operative and planning/controlling tasks at the shop-floor level. In contrast, knowledge systems seem to have an equal chance of being deployed in most sectors. Only in the food, beverages and tobacco industry this concept seems to be significantly less used. The odd ratio is quite low thus indicating a fair reduction of the chance of using knowledge systems in firms of this sector compared to firms in machinery.

As expected from the descriptive analysis, the **number of employees** shows a statistically significant positive relationship with the use of all four organisational concepts under consideration here. Firstly, this underlines the previously stated suggestions that larger firms face a greater need for organisational innovation due to their firm size and, secondly, receive greater benefits from the implementation of organisational concepts in terms of increased productivity effects. Such economies of scale indicate the presence of a size-related barrier to organisational innovation for the group of smaller firms, whose firm size lies below a certain threshold. To gain further insight into this size-related effect, this aspect will be revisited in the course of the qualitative firms' case interviews.

Table 42: Multivariate regression models on the use of specific organisational concepts (dependent variables) – findings from the basic model

		Use of organisational concept			
Construct	Indicators	Task integration	Shop floor segmentation	Quality circle	Knowledge systems
		OR Sig.	OR Sig.	OR Sig.	OR Sig.
country	Austria	1.43 ** (sig.)	1.26 (sig.)	0.79 (sig.)	1.61 ** (sig.)
	Netherland	1.18	3.17 ***	0.59 ***	3.78 ***
	France	0.77	1.54 **	0.49 **	3.33 ***
	Denmark	1.70 ***	1.37 *	0.19 ***	1.74 **
	Croatia	0.94	2.76 ***	0.51 **	1.32
	Spain	1.39	3.17 ***	0.92	1.39
	Slovenia	0.52 **	2.49 **	0.55 **	1.69 *
sector	Food, beverages and tobacco (NACE 15, 16)	0.50 *** (sig.)	0.34 *** (sig.)	0.98 (sig.)	0.44 ** (sig.)
	Textiles, wearing apparel, and leather (NACE 17, 18, 19)	0.49 ***	0.57	0.35 **	0.59
	Paper, publishing, and printing (NACE 21, 22)	0.47 **	0.35 ***	0.75	0.73
	Chemicals and chemical products (NACE 24)	0.42 ***	0.48 **	0.93	1.02
	Rubber and plastic products (NACE 25)	1.04	0.96	0.82	1.35
	Basic metals and metal products (NACE 27, 28)	1.07	0.82	1.10	1.13
	Electrical machinery, office and communication equipment	1.05	1.27	1.01	1.33
	Medical, precision, and optical instruments (NACE 33)	0.76	1.08	0.86	1.07
	Motor vehicels and transportation equipment (NACE 34, 35)	1.27	1.09	0.54 **	1.25
	Others (NACE 20, 23, 26, 36, 37)	0.80	0.66 **	0.67 **	0.70
firm size	Firm size	1.44 *** (sig.)	1.52 *** (sig.)	1.60 *** (sig.)	1.38 *** (sig.)
product complexity	Product complexity: simple products	0.57 *** (sig.)	0.81 (n.s.)	0.63 ** (sig.)	0.57 ** (sig.)
	Product complexity: medium complexity	0.93	1.06	0.74 **	0.74 **
average batch size	Average batch size: single unit production	0.75 + (sig.)	0.78 (n.s.)	0.55 *** (sig.)	0.70 * (n.s.)
	Average batch size: small and medium batch size	1.19	1.04	1.03	0.84
strategy	Innovative products leadership	1.24 (n.s.)	1.46 ** (sig.)	0.86 (n.s.)	1.17 (n.s.)
	Constant	0.32 ***	0.07 ***	0.17 ***	0.07 ***
Model fit	N	2159	2157	2116	2091
	Sig.	0.0000	0.0000	0.0000	0.0000
	-2 Log-Likelihood	2762.5	2504.1	2492.9	2018.6
	R ² Nagelkerkes / Cox & Snell	0,115/0,086	0,151/0,109	0,188/0,138	0,110/0,071

Source: EMS 2009, Fraunhofer ISI, own calculations

OR = Odds ratio, ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level, sig. = construct significantly at the 90% level effecting the explanation of the concept us, n.s. = no significant influence.

In contrast to firm size, **product complexity and batch size** are characterised by ambivalent relationships towards the organisational concepts. Referring to these two production characteristics does not improve the explanation of the use of each organisational concept. However, in line with the previous argument of less complex working processes in traditional sectors raised above, a low product complexity seems in particular to support the above-mentioned complementary relationship between product complexity and organisational innovation like task integration, quality circles or knowledge systems. This appears reasonable as, for instance in the case of knowledge management, simple products, which are tendentially more often manufactured in non-R&D-intensive industries (Som et al. 2010), are accompanied by a lower relevance of codified knowledge. Instead, such manufacturers more frequently rely on implicit, practical and experience-based knowledge, which can hardly be made explicit via

knowledge management systems (Heidenreich 2009; Hirsch-Kreinsen 2004; von Tunzelmann/Acha 2005). Likewise, simple products either require less standardised quality management or allow for automated quality assurance. Average batch size only determines the use of quality circle and task integration. Interestingly, the use of quality circle is negatively associated with single unit production. This might be due to the highly individual, customer-specific character of each product which can hardly be grasped by standardised processes and routines of quality management.

Last but not least, innovation product leadership as the **primarily strategic orientation** of a firm is only positively connected with the use of shop floor segmentation. This is also in line with previous descriptive findings: due to their complexity and freedom in terms of implementation, a single organisational concept can serve different strategic goals as, for instance, team work can be targeted at both increasing cost efficiency and increasing quality (Armbruster et al. 2007).

In this second step, additional variables dealing with aspects of organisational behaviour were each tested by a total set of 28 regression analyses (4 concepts x 7 additional variables) integrating these additional factors into the basis model as described above. This turned out to be a feasible approach, as each factor can be assessed independently while monitoring the main structural influences. Building on the previous descriptive analyses, these additional variables of organisational behaviour are:

- No performance of R&D activities in 2008 (yes/no)
- R&D expenditures in 2008 (as percentage of turnover)
- Share of highly skilled employees (percentage of total number of employees)
- Share of highly skilled employees (firm belongs to the upper tier in its country – y/n)
- Collaboration with external partners in the field of organisational innovation (y/n)

With regard to R&D, we differentiate between the performance of R&D activities if any took place, and, if a firm did perform R&D in the previous year, the share of the expenditures devoted to R&D. This allows us to distinguish whether a probable relationship is more likely to be based on the mere performance of R&D activities or on the level of R&D-intensity, instead. The reason why we check for two different variables dealing with highly skilled employees is to cover two different dimensions. First the percentage of highly skilled employees in the firm tells us something about whether there exists a "the more, the better" relationship between this share and the use of organisational concepts. Secondly, as already argued in the descriptive section, there are differences in the countries' definition of what is to be understood by highly skilled employees. Therefore, we test for an additional variable, concerning whether the use of organisational concepts correlates to the circumstance that a firm belongs to the upper tier with regard to their number of highly skilled personnel, regardless of the actual level. For this reason, the total firm sample has been grouped into three tiers, according to their ranking position. Thus, the firms located in the "highest tier" accordingly show the highest shares of highly skilled employees, and so on.

Furthermore, following previous findings of Evangelista and Vezzani (2010, 2011) or Battisti and Stoneman (2010), who revealed that the innovation strategies of successful growing firms are often characterised by the combination of product, process and organisational innovation, we included the following variables of innovation performance available in EMS 2009 to shed some light on the question whether organisational concepts themselves might be driven by firms' innovation performance:

- Export ratio in 2008 (share of all products that are sold abroad)
- Firm has been a product innovator within the past three years (y/n)
- Share of product innovation on turnover
- Firm has been a service innovator within the past three years (y/n)
- Technological process innovation (at least one technology introduced within the past three years - y/n)

Table 43 presents an overview of the results from the multivariate logistic regression analyses conducted. Detailed information about each of the 28 regression models can be found in the annex. In general it can be stated that all the models support the existence of a correlation between the independent variables and the use of the organisational concepts.

Table 43: Correlations of additional factors on the use of specific organisational concepts – analysed by enlarged logistics regression models

	Use of organisational concept							
	Task integration		Shop floor segmentation		Quality circle		Knowledge systems	
	Influence	Sig.	Influence	Sig.	Influence	Sig.	Influence	Sig.
Export ratio (%)							+	***
No R&D activity in 2008	-	***			-	**	-	**
Share of R&D expenditure (%)	=				=		=	
Share of highly qualified personnel			+	*			+	**
Share of highly qual. employees in the country's upper tier								
No product innovation within the past three years	-	***	-	***	-	***	-	***
Share of product innovation on turnover	=		=		+		=	
Service innovation within the past three years	+	***	+	***	+	***	+	***
Innovation collaboration on new organisational concepts	+	***	+	**	+	***	+	***
Technological process innovation (at least 1 techn. introduced)	+	***	+	***	+	***	+	***

Source: EMS 2009, Fraunhofer ISI, own calculations

Significance of influence: ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level. + odds ratio above 1. - odds ratio below 1. = odds ratio near 1.

Multivariate tests were based on 28 logistic regression models including additionally country, sector, firm size, product complexity, average batch size, strategic priority.

The findings of the multiple tests show some similarities by demonstrating positive correlations between the use of the constructs analysed and the product and service innovation activities within the firms, as well as the participation in innovation collaboration on organisational concepts. These results are statistically significant for all four models.

To start with the latter, the **participation in innovation collaboration** shows a strong positive correlation with the use of the concepts considered. Hence, if firms are able to find suitable external collaboration partners for implementing an organisational innovation, they might have a

significantly higher chance of making use of an organisational concept. Thereby, this finding underlines the systemic relevance of well-functioning processes and institutional settings of knowledge diffusion that allow firms to identify appropriate partners also for the case of organisational innovation activities; at least for the concepts taken into account here. However, this relationship might also run the other way round: firms with well organised (e.g. standardised) processes with well-defined interfaces to their external environment are more successful in finding collaboration partners than other firms. The question whether and how firms succeed in identifying and exploiting external knowledge for organisational innovation is certainly an aspect that has to be followed up in the firms' case interviews.

Furthermore, previous findings about the **complementarities between organisational innovation and product/service innovation** are also confirmed on the basis of four concrete organisational concepts. Besides the enabling role of organisational innovation for other types of innovation (which will be analysed subsequently), the results highlight the circumstance that organisational innovation is accompanied by product or service innovation activities which require organisational adaption. This is particularly the case for product-related service innovations, which often require new organisational interfaces to customers or reorganisation of working and manufacturing processes to bundle the necessary knowledge and competences for the offered service (e.g. through task integration or shop floor segmentation). To provide another example, the introduction of a new product into serial production usually takes a certain ramp-up time until the new processes become stable and fit the quality requirements. Thus, firms that are highly active in the development of product innovation might face severe problems in their manufacturing processes as they are regularly disturbed or interrupted by the ramp-up processes of new products. As the positive relationship for the concept of shop floor segmentation shows, this problem can be addressed by establishing product-specific manufacturing lines which allow for implementing a new product in serial production without disturbing the remaining, stable manufacturing lines. Likewise, the use of knowledge-based systems can be triggered by the offer of product-related services like maintenance, repair, technical documentation or training, which requires a certain stock of codified knowledge that is systematically accumulated and made available to all employees working in these services. Similar to product and service innovations, the implementation of a **technological process innovation** also reveals strong and significant, positive complementarities with the use of all four organisational concepts and thereby also supports previous findings. Introducing a new production technology like new machinery is thus likely to create new requirements or possibilities for work organisation. An example for such a positive complementarity is the use of semi-automated production lines with teamwork in the automotive industry. The simultaneous use of both technological and non-technological concepts thereby results in higher benefits than the single use of one of them.

Interestingly, the **export orientation** of the manufacturing firms only shows a significant positive correlation with the concept of knowledge-based systems. This somehow contradicts our expectations because a higher export orientation could be reasonably assumed to increase the need for process organisation, also in terms of work or production organisation. This thought might be supported by the slightly positive tendencies that can be observed, but which nevertheless are not statistically significant. But for knowledge-based systems, the positive correlation is plausible

because exporting firms are heavily reliant on the global availability of necessary knowledge and information underlying the products in standardised forms, which can be used by offshore production and R&D sites or regional/local distribution partners. In turn, firms which are more active in exporting abroad are often characterised by higher shares of highly skilled employees producing complex products, which requires systematic management of innovation knowledge.

As far as the role of **R&D** is regarded, there are only significant positive correlations between the general performance of R&D activities, while the level of the firms' R&D-intensity does not play an important role. The odds of using the organisational concept decrease significantly when not performing R&D. Hence, the presence of institutionalised R&D activities in terms of a systematic process of knowledge production is obviously connected by a higher use of organisational concepts that enhance systematic knowledge exploration and exploitation (via knowledge-based systems) both in downstream (to the employees via task integration) or upstream (via quality circles) direction.

Finally, the role of **highly skilled employees** is somehow ambiguous. While there was a clear positive relationship between firms belonging to the upper tier in their country with regard to their share of highly skilled employees and the use of organisational concepts, these bivariate results are not confirmed by the multivariate tests monitoring structural characteristics of the firms. So, the probability of using one the organisational concepts is not connected by the circumstance that a firm has a higher share of highly skilled personnel compared to most of its other national counterparts. Instead, at least regarding the selected concepts of shop floor segmentation and knowledge-based systems, a higher share of highly skilled employees is significantly related to the use of one of these concepts. While this positive relationship appears obvious in the case of knowledge-based systems, production segmentation into different lines is often accompanied by a segmentation of production or quality management. The higher the number of highly skilled employees, the easier it becomes for firms to fill in the additional functions and to offer them attractive job perspectives. But there is another finding that should be pointed out with regard to the concepts of task integration and quality circles. Both concepts are not significantly correlated with the number of highly skilled employees. This means that also firms with a higher share of medium, low or unskilled employees, which is tendentially the case for non-R&D-performing firms (Som 2012), can nevertheless make use of such concepts to enhance their performance (Som et al. 2010; Som 2012).

4.2.16 Economic effects of selected organisational concepts

As described in the conceptual part of this report, the positive direct and indirect economic impacts of organisational innovation have been widely acknowledged by previous studies. Moreover, the previous analyses based on CIS data have also underlined the positive impacts of organisational innovation in firm growth in terms of increases of sales and employment on the overall performance level. In this section, we want to supplement these findings by investigating the economic effects of selected organisational concepts on the innovation and process performance of firms. The aim is to provide novel empirical evidence about positive complementarities of single

organisational concepts and product innovation, service innovation as well as the labour productivity of firms. Because the CIS data neither provides variables about single organisational concepts nor about the labour productivity of firms, this gap is closed by the following analysis on the basis of the EMS 2009 data.

Similar to the previous multivariate correlation analyses, for each output measure a basis model was formulated by including structural variables that might be positively related to the dependent output/performance variable. In each regression analysis, these variables were used as control variables to assure that the identified effects are not correlated to the structural peculiarities of firms. Depending on the dependent variable's scale of measurement, we estimated either logistic (firms is a product/service innovator – binary dependent variable) or linear (share of sales of product innovations, labour productivity – metric dependent variable) regression models. Similarly, as different organisational concepts are not consistently aiming towards the same output dimensions (Armbruster et al. 2007; MEADOW-Consortium 2010; Som 2012), we selected a number of concepts available in EMS that, on the one hand, might be reasonably assumed to be positively related to the respective output dimension, and, on the other hand, offer a sufficient number of cases.

Following the recommendations formulated by Armbruster et al. (2007) on the measurement of the economic effects of organisational innovations, we estimated each organisational concept in a separate regression model to avoid correlations being concealed or over-emphasised due to interactive effects between different concepts. Furthermore, as argued in the theoretical section, by representing routines of individual and organisational behaviour, organisational concepts might show up their positive economic relationship only when they have been widely been diffused and institutionalised within an organisation. Thereby, to assess the economic effects of organisational concepts, it is necessary also to consider the intensity by which the respective concept is deployed. To grasp the intensity of use, firms were asked by the EMS survey to what intensity (low, medium, high) they deploy a certain concept referring to the maximum reasonable level within the firm. Although this measure is subject to individual estimation by the interviewees, it nevertheless provides some information about whether a concept is only “used” or whether it has been diffused to a larger extent within a firm.

To start with the impact of the organisational concepts on product innovation activities of manufacturing firms, table 44 summarises the findings from 16 regression analyses. The selected concepts, which were tested for their relationship with firms' product innovativeness, are regular appraisal interviews as a concept of human resources management. They systematically enhance the professional and social development of employees, temporary cross-functional teams are a concept to flexibly integrate the professional expertise of employees if needed. Quality circles are a concept that encourages employees to identify and implement continuous improvements in products or manufacturing processes, shop floor segmentation is a concept to bundle product or customer-related knowledge, task integration empowers the individual responsibilities of employees and the participation in innovation collaboration exploits external resources relevant for product innovation.

Table 44: Relationship between organisational concepts and firms' product innovation activities and share of turnover with product innovation (dependent variables)

<i>organisational concepts</i>	product innovation within the past three years	share of turnover with product innovations (product innovators only)
	OR Sig.*	Coef. Sig.*
regular individual appraisal interviews: use	1.17	0.045
highly/medium used: regular individual appraisal interviews	1.32 *	0.032
temporary cross-funtional project teams: use	1.37 **	0.095 **
highly/medium used: temporary cross-funtional project teams	1.25	0.111 **
quality circle: use	1.12	0.013
highly/medium used: quality circle	1.10	0.023
shop floor segmentation: use	1.43 **	0.074 **
highly/medium used: shop floor segmentation	1.36 **	0.038
task integration: use	1.46 **	0.010
highly/medium used: task integration	1.21	0.024
innovation collaboration on new products	2.54 ***	-0.060 *

Source: EMS 2009, Fraunhofer ISI, own calculations

OR = Odds ratio / *) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level

All 11 logistic/ 11 linear regression models control for: country, sector affiliation, firm size, product complexity, average batch size, share of highly skilled employees, R&D-intensity, vertical range of manufacture

It becomes apparent from the table 44 that except for the concept of quality circles, all the considered concepts show significant positive complementarities with product innovation. As for regular appraisal interviews and shop floor segmentation, however, the effects only become visible if the intensity of use is taken into account, which makes sense in both cases. In contrast, for temporary cross-functional teams and task integration, the positive impact is not necessarily connected to the intensity of use. This appears to be reasonable as, for instance, an intensive use of cross-functional project teams might result in cognitive dissociation which, in the end, serves as a barrier for the generation of impulses for new products. Similar, highly intensive shop floor segmentation could result in employees working in the segments feeling less committed to the overall organisation, which results in lower levels of knowledge backflows to product development. Most surprisingly, quality circles, usually seen as driving and especially incremental product innovation through continuous improvement processes (Kirner et al. 2011), do not show a significant effect. In contrast, the participation in innovation collaborations on new products shows, as expected, by far the most positive effect on firms' product innovativeness.

The positive correlations of some of the organisational concepts with the firms' propensity to successfully develop product innovations are not reflected in terms of a higher share of turnover with these new products. However, this appears plausible because the market success is not necessarily targeted by organisational concepts. Instead, new functionalities, new design or new distribution channels are more likely to have an impact on product sales. Instead, as becomes visible in the data, organisational concepts are primarily aimed at improving the underlying processes of product development and knowledge integration and thereby improving the tendency

that new products are developed at all. It is unfortunate that EMS does not yet provide variables on marketing concepts. Otherwise, they might probably have shown higher impact on innovative product sales than on the firms' propensity to be a successful product innovator.

In contrast to product innovation, the identification of organisational concepts that might be directly related to product-related services is slightly more difficult. Therefore, given the set of concepts available in the EMS, we selected three types of organisational innovation to be tested. Firstly, the offer of product-related services necessarily require enlarging the level of individual responsibility and competences of employees working in the service department, as they otherwise will not be able to deliver the service performance autonomously at the customer's site. Secondly, shop floor segmentation might ease the offer of product-related services, since the necessary knowledge is already bundled along customer or product specific lines. The manufacturing lines can be specifically designed and adapted for each product/customer so that the later service offer is already laid out in the manufacturing process (e.g. maintenance-friendly parts, modularity). Thirdly, to encompass also the external dimension of organisational innovation, collaboration activities for service innovation are also considered in the analysis.

Table 45: Relationship between organisational concepts and firms' service innovation activities

	service innovation with the past three years		share of turnover with service innovations (service innovators only)	
	OR	Sig.*	Coef.	Sig.*
<i>organisation concepts</i>				
Task integration: use	1.81 ***		-0.001	
Highly/Medium Used: Task integration	1.77 ***		0.053	
Shop floor segmentation: use	1.73 ***		-0.072	
Highly/Medium Used: Shop floor segmentation	1.56 **		-0.036	
<i>innovation collaboration on new services</i>	1.93 ***		0.085	

Source: EMS 2009, Fraunhofer ISI, own calculations

OR = Odds ratio / *) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level

All 5 logistic/linear regression models control for: country, sector affiliation, firm size, product complexity, average batch size, share of highly skilled employees, share of employees working in service

As table 45 shows, all three concepts demonstrate the expected, significant positive impact on firms' service innovativeness, with innovation collaborations on services revealing the greatest effect. Remarkably, the positive effects of task integration do not lose their significance with higher intensity of use, although the impact is slightly decreasing. This underlines the assumption that service employees per se need a high degree of task integration to fulfil their job.

As in the case of product innovation, there are no significantly positive impacts on the share of turnover obtained by service innovation. The reasons for this result might be the same as for product innovations. However, it has to be mentioned that the number of valid cases for turnover with service innovations is very scarce as neither many firms are service innovators nor are they able to report their share of sales obtained by such innovation activities.

Finally, to consider an output variable of process efficiency, table 46 entails the findings in the effects of organisational concepts on the labour productivity of firms. Labour productivity is defined by turnover minus input divided by the number of employees. Again, we selected a couple of organisational concepts available in the EMS that might be positively linked to productivity, including flexible working time arrangements, internal zero-buffer principle (e.g. Kanban), shop floor segmentation, teamwork in production, task integration, quality circles and regular individual appraisal interviews.

Table 46: Relationship between organisational concepts and firms' labour productivity

<i>organisational concepts</i>	labour productivity	
	Coeff.	Sig.*
flexible working time arrangements: use	-0.028	
highly/medium used: flexible working time arrangements	-0.031	
internal zero-buffer principle: use	0.011	
highly/medium used: internal zero-buffer principle	0.053	**
shop floor segmentation: use	-0.001	
highly/medium used: shop floor segmentation	0.049	**
teamwork in production: use	-0.007	
highly/medium used: teamwork in production	-0.042	*
task integration: use	0.034	
highly/medium used: task integration	0.040	*
quality circle: use	0.023	
highly/medium used: quality circle	0.028	
regular individual appraisal interviews: use	0.030	
highly/medium used: individual appraisal interviews	0.084	***

Source: EMS 2009, Fraunhofer ISI, own calculations

OR = Odds ratio / *) ***= significant at the 99% level, **= significant at the 95% level, *= significant at the 90% level
All 14 linear regression models control for: country, sector affiliation, firm size, product complexity, average batch size, R&D-intensity, share of highly skilled employees, share of employees working in manufacturing, export ratio, degree of capacity utilisation, verticle range of manufacturin, implementation of technological process innovation

The results show that by far not all of these organisational concepts are positively related to firms' labour productivity, although the negative effects are not statistically significant (e.g. flexible working time arrangements or teamwork in production). The same applies to quality circles, which although showing a positive coefficient, neither have a significant effect on productivity. Although there might be good arguments for assuming that the concepts mentioned are positively affecting process efficiency, for instance by allowing for flexible adjustments of worker capacity (e.g. working

time arrangements), the parallelising of working processes (e.g. teamwork) or continuous impulses for improvement (e.g. quality circles), they are obviously either not primarily targeted at increased efficiency or their efficiency-increasing effects are mediated by a number of intermediary cause-and-effect-relationships with additional variables that have not been taken into account here.

However, with regard to the remaining concepts, there are clear indications of positive correlations with productivity in terms of reducing idle periods between working processes (e.g. zero-buffer principle), exploiting economies of scale and scope by implementing product or customer-specific manufacturing lines (e.g. shop floor segmentation), shortening the decision-making process through increased individual responsibilities (e.g. task integration), or increasing employees' motivation by promoting their individual and professional development (e.g. regular appraisal interviews). Despite the direct effects observed not being earthshaking due to the multiple influencing factors on productivity at firm level, it is all the more noticeable that they persist, even under the control of the basic model, which depicts with a the clear direction that a more intensive use leads to additional productivity gains.

To briefly summarise the main findings, the results concerning the economic impact analyses based on EMS data generally show positive relationships between the selected organisational concepts on firms' productivity performance as well as positive complementarities with the fields of product, service, and technological process innovation. It has to be noted, however, that not all organisational concepts considered show equally positive correlations. While some are positively linked to one performance dimension they might have no or an even negative relationship to others. Moreover, for some organisational concepts their positive connection with firm performance becomes only visible if they are deployed at a certain intensity. As the performance variables related to product and service innovation show, to assess the economic effect of organisational concepts adequately, it is also necessary to choose the right performance dimension. By looking only at the share of turnover obtained by new products, the positive impact of organisational concepts runs the risk being underestimated. As these findings underline, organisational innovation represents a highly complex issue which does not allow for one-size-fits-all approaches. With regard to innovation policy, this means that the design of policy instruments needs to be carefully adjusted to the performance dimension that should be addressed.

4.3 Conclusions of quantitative analyses

Based on the rich and diversified body of empirical firm data, the previous quantitative analyses have revealed some key aspects about the use and the economic effects of organisational and marketing innovation that needs to be addressed by the subsequent firms' case interviews in more depth.

Regarding the use of organisational and marketing innovation, a considerable impact of firm size became visible. However, with firm size being a proxy for multiple dimensions, quantitative analysis could not ultimately clarify which aspects of firm size related barriers such as availability of personnel, financial, knowledge or network resources play an important role for organisational and marketing innovation. Firstly, it remains unclear from the quantitative analysis which role is played

by the availability of specialised knowledge about organisational and marketing innovation inside the firms. For instance, while the share of highly skilled employees showed a considerable correlation with their use in bilateral analysis, this effect diminished in the multivariate regression models. Thus until now it remains open, with regard to which actors inside the firm initiate organisational and marketing innovations, how these are developed and implemented as well as how strong the awareness of firms is about solutions in these fields.

Likewise, the results reveal that the acquisition of external knowledge and information also increases the probability of deploying an organisational or marketing innovation. But the quantitative findings have so far provided no answer concerning to which degree organisational or marketing solution can be transferred between different firms and if firms succeed in identifying external partners for their innovation activities in these fields. Last but not least, as the corresponding question in the CIS does not allow for differentiating innovation barriers across different types of innovation, it would be also highly interesting to address questions of uncertainty and lack of financial capital in the context of organisational and marketing innovation in the firm interviews as well.

Looking at the positive relationships between organisational innovation and skills, product complexity and technological intensity of firms, there is evidence that organisational and marketing innovation are positively related to other fields of innovation, like new goods, new services, and new manufacturing processes. This indicates their role as an “enabler” and “prerequisite” of other types of innovation. However, without the use of panel data the identification of such complementarities in use between technological and non-technological innovations says only little about their causal relationship. Hence, this aspect also needs to be taken up in more detail by the firms’ case interviews. But it has also to be clarified whether and under which conditions organisational and marketing innovation are recognised as distinct elements of firms’ innovation strategies.

With regard to the economic effects of organisational and marketing, the quantitative findings of this report reveal that both are positively related to firms’ economic performance either in a direct (e.g. on sales growth and productivity) or indirect way (via other fields of innovation). But similar to the use, the quantitative findings cannot provide information about the causal linkage between the use of organisational or marketing concepts and the positive outcome, since both causal directions can be reasonably argued. Hence, the firms’ case interviews can contribute to enhancing this understanding by focusing on both, the positive effects of organisational and marketing innovation as a driver of innovativeness and competitiveness as well as complementarities in performance between technological and non-technological innovation.

Finally, the indicators about the usage and effects provide little insight into process-related factors/barriers that occur during the development and implementation. Therefore, the qualitative analysis will also have to include these aspects as they might strongly influence the use or disuse of organisational and marketing innovations in the end. More specifically, it has to be clarified to what extent such process-related barriers and obstacles have their origin within the firms or to what degree they are related to problems and difficulties located in the environment. Only if these barriers are fully understood, can appropriate action be taken.

5 Barriers to organisational and marketing innovation – empirical evidence from 14 example case studies of European firms

To obtain deeper insights into the deployment, the economic effects and, in particular, the barriers of organisational and marketing innovation among European firms, exemplary firm case studies were conducted. The qualitative approach thereby allows for the understanding of organisational and marketing innovation within their firm-specific project constellation, which sheds light especially on the barriers for these types of innovation. Moreover, the case studies were used to complete our theoretical approach by checking for unexpected perspectives mentioned by the enterprises. In addition, the previous quantitative analyses will be supplemented by detailed insights into organisational and marketing innovation on the firm level. Dealing with the broad field of non-technical innovation 14 case studies do not allow for generalisations. In future research with a more delimited topic, case studies might allow for showing at least the variance within a given field of organisational or marketing innovation. The goal for the case studies presented here was to open up perspectives for future research following an explorative approach.

In this section, the methodological approach to the case studies and the selection of the enterprises is discussed. In the following step, the results for marketing innovation and organisational innovation are presented separately by short firm profiles which contain the firm-specific setting, the original problem that triggered the organisational or marketing innovation project, the solution that has been developed, as well as case-specific hampering factors and lessons learned. Secondly, the single firm case examples are also discussed across the cases in order to

- gain insight into how organisational and marketing innovations are implemented to solve firm-specific problems
- assess the economic contribution of organisational and marketing innovation
- gather evidence on the question whether and to what extent organisational and marketing innovation activities are hampered by external barriers
- explore the question whether firms might make use of public support in their corresponding organisational or marketing innovation activities

These questions imply a strong focus on the overall setting of the project and external barriers to marketing and organisational innovation. Therefore internal barriers like the resistance to change were discussed in the interviews, being an inevitable part of every process within an organisation, but were only analysed with respect to their linkage to external barriers.

In the following, the methodological approach will be discussed and the outline of the interview guideline will be presented. In addition, the selection criteria and selection process will be portrayed. Based on these considerations, the findings on marketing innovation and organisational innovation are subsequently presented.

5.1 Methodological approach to the qualitative example case studies of European firms

Due to the explorative character of our research question whether marketing innovations and organisational innovations are drivers of growth which are being hampered by external barriers, qualitative case studies were a necessary supplement to the theoretical framework and the quantitative analysis. The field of hampering factors and policy support for non-technological innovation is still characterized by scarce research (Edquist 2011), so that, besides the aforementioned questions, the study also aims at opening up perspectives for future research. Therefore, a qualitative approach helps to find neglected perspectives which need to be included in the theoretical conception of marketing and organisational innovation. Additionally, new hypotheses for future quantitative research may appear. The case studies serve to complement the information stemming from the quantitative analysis, i.e. both approaches should benefit from each other (King et al. 1994).

Furthermore, the evolutionary perspective for understanding organisations and enterprises as open social learning entities (see Chapter 2.1) implies that case studies should be conducted. As innovation happens as a reaction to the environment and can be conducted combining the capacities of internal and external actors, a detailed knowledge about the constellation is necessary. A qualitative approach focusing in depth on examples for marketing and organisational innovation shows the complex relations between the rationales of the different participants and highlights how the new solutions emerge from this process. Due to the intertwined causal structures, hampering factors can only be understood in the light of their relevant constellation. This detailed understanding of hampering factors is a necessary precondition for discussing in which way policy intervention aiming to support marketing and organisational innovation can be justified and especially how a corresponding instrument should be designed (Edquist 2011). Case studies facilitate an in-depth analysis of the challenges firms face when dealing with market or systemic failures, their strategies and ultimately the implementation of marketing and/or organisational innovations to overcome the respective challenges.

In contrast to other definitions, the term "case" in this study is guided by the definition put forward by George/Bennett (2005), who consider a case to be "a class of events". A class of events refers to a particular phenomenon of scientific interest that is chosen in order to generate new knowledge regarding the similarities or differences among instances. Following this definition, a case study is a small and well-defined aspect of a historical occurrence. Therefore, it is vital for the success of the analysis of the case studies to have similar classes of events. In our case that means identifying firms that can be analysed in the same way. Put differently, firms that have not yet dealt with any kind of marketing or organisational innovation will not be part of the study.

The strength of case studies by and large lies in their conceptual validity, their procedures for fostering new hypotheses, the possibility to identify causal mechanisms and in addressing the causal complexity (George/Bennett 2005). Most relevant in the course of this study are the two latter aspects, the identification of causal mechanisms and the reference to causal complexity. Causal mechanisms need to be seen in the light of contextual factors that are often different for each case. Therefore, causal mechanisms need to be analysed in individual cases in more detail.

As regards causal complexity it is important to note that case studies allow important aspects such as path dependency or critical junctures to be addressed. The necessary extensive process-tracing and documentation of complex interactions may yield less general (as for example large-N studies) but narrower and more contingent results.

In general, case study methods include both within case analysis of individual cases as well as comparisons of a small number of cases (Yin 2003). By combining the results of the within analysis we aim to draw inferences as regards the main research questions of this study, namely the challenges faced by firms due to external hampering factors and their strategies to implement marketing or organisational innovation. Therefore the qualitative part of this study does not only aim to provide a better understanding of the processes within firms when it comes to organisational and marketing innovation, but also aims first to shed light on hampering constellations for these types of non-technical innovation. It is important to note that particular concepts, ideas or theoretical expectations may change their importance during the course of conducting the case studies. Interviews, document analysis, the sketching of historical firm decisions may inductively lead to other perspectives, details or causal connections which might have been overlooked in the first phase of research (van Evera 1997).

Another challenge of case studies is their supposed limitation to infer generalisations. In the light of the myriads of firms in heterogeneous countries with different framework conditions in Europe and the different dynamics in the respective economic sectors they belong to, a sample of a limited number of example cases may not yield sufficient (statistical) evidence. They may be not more than just spotlights. The issues of geographical and sectoral coverage as well as firm-specific characteristics that are considered to be of importance (large vs. small, young vs. old) need to be carefully addressed when comparing the cases and when drawing conclusions, as discussed in the following section. To link the singularity of each case to more common developments under European enterprises, we point out structures that could be considered to be applicable to larger groups of firms, as for example the flexible matrix-organisation to cope with knowledge-intensive projects implies the same hindrances for organisational innovation in the highly specialized niche of naval equipment as in branches like the IT sector.

5.1.1 Interview guidelines for the qualitative example case studies

The interviews conducted with firm representatives need to address many different topics in order to draw a complete picture of the impacts of organisational and marketing innovation on the firm. The qualitative analysis allows not only the working hypotheses to be addressed, but also additional barriers to be covered as well as unveiling causal relations to firm strategies and other fields of (technological) innovation. To cope with that broad range of questions and complex theoretical concepts, an interview guideline was developed for the interviews (see Annex I). This guideline was developed against both the theoretical background of this study and the derived working theses to interlink the quantitative research with the case studies. Additionally, questions about the existing policy support for the projects conducted opened up perspectives to the policy analysis part of our study.

The first challenge concerns the interview partners. The internal validity (Yin 2003) of the case studies may be compromised if the interview partners limit their input to mere narratives of the firm success and glossy brochures. The challenge remains to uncover causal mechanisms and causal complexity in order to generate new generic knowledge on the case, e.g. the class of events that lead to the implementation of organisational and marketing innovation. By asking in an open manner about the constellation, challenges and the different groups participating, the interviewees were animated to describe the project by saying what had been done as opposed to evaluating the project. Due to restrictions in the timeline, the case studies were conducted mostly with management representatives or members of the project teams who had implemented the innovation, so that the perspective of conflicts and power within the organisations remain underexposed to a large extent. But this appears to be a minor problem in the context of this study, because the inner organisational rigidities are of less interest for the perspective of external systemic failures to marketing and organisational innovation.

A special challenge was to bridge the gap between the abstract concepts of market and systemic failures and the experiences made within firms on the implementation of organisational and marketing innovation. It was vital not to "scare" firm representatives with overburdening theoretical considerations and even more important to leave space so that the interviewees could highlight what seemed important to them, but still to cover the theoretical constructs to answer our research question.

Resuming the questionnaire, key concepts and research questions have been covered by the interview guideline as follows (see Annex I for the detailed questions):

- Economic impact of marketing and organisational innovation: questions about direct revenues, indirect revenues and positive effects on other types of innovation
- Evolutionary perspective on innovation: questions regarding the overall firm, participation of other actors (suppliers, customers etc) in the innovation process
- Externalities/public goods: questions about the risk of organisational or marketing innovations being imitated by competitors as well as about the importance of role models to trigger or guide organisational or marketing innovations
- Uncertainty: questions regarding revenues, expectations in the beginning and changes in these expectations, approval of resources
- Policy support: questions about funding or support from public institutions, known policy instruments, and how general problems might be addressed by policy support

5.1.2 Selection and characteristics of the case studies

The selection of the cases is a major concern for explorative research project. The selection bias has often been portrayed as one of the main pitfalls in social science (King et al. 1994). However, in contrast to certain statistical methods where the selection bias is more often a problem, the qualitative part of the current study purposefully chooses cases which share the same outcome. Thus exemplary and/or distinctive cases were identified, i.e. firms that gained experience with

marketing or organisational innovation in the past and that can provide insightful knowledge on whether and to which degree marketing or organisational are affected by external hampering factors. A certain "bias" may occur when considering that we are mainly dealing with success cases, i.e. firms that have successfully implemented marketing or organisational innovation. Firms that were not successful are not only difficult to identify but might also be rather reluctant to share information with the research team.

It turned out to be very difficult to convince enterprises all over Europe to participate in this study, without being in contact with them before. The necessary interest, trust and willingness to spend time on a research programme can hardly be won by an external research institute from another country just by a phone call and e-mails, even having the European Commission as the principal institution. To solve this problem, we relied heavily on direct personal contacts to enterprises of our European partner institutions from past research projects. This approach was not only important for increasing the success rate when approaching the firms, but also guaranteed a sufficient level of trust between the study team and the interviewees. This turned out to be vital for obtaining the willingness of the firms to participate. However, after contacting over 45 enterprises, associations and research institutes it can be said that the willingness of European enterprises to participate again and again in research projects has dropped tremendously. Due to the overwhelming number of requests from researchers to participate in quantitative or qualitative studies, most of the firms contacted by us have decided not to participate in research projects any longer. Moreover, as our INNO-Grips study does not provide direct benefits for firms, such as the development of solutions or tools for practical innovation management, the incentives for firms to take part in the case study interviews were low.

The firms were selected to cover a broad variety along the dimensions of region, sector and branch respectively the main product group and firm size. This variance does not allow any generalisations for the named branches or sectors, but it opens up perspectives on marketing and organisational innovation. For a further validation of the case studies, interviews with experts working in the field of organisational innovation and marketing were conducted. Thereby we are able to include a meta-perspective on the recurring hampering factors in the single cases.

Given these constraints in this study, it was not possible to realise the geographical and sectoral coverage as originally intended. But since the main focus of the case studies is to uncover certain causal mechanisms within firms and to derive new "generic knowledge", the bias due to the selection is negligible. Nevertheless, the selected cases for our interviews show a remarkable variance of enterprises despite these constraints. They cover most of the bigger regions of the European Union: Southern Europe (Spain, Italy), Middle Europe (Netherlands, France, Germany and Austria), Eastern Europe (Croatia) and Northern Europe (Norway). With regard to firm size, the selected cases include small and medium sized firms as well as larger enterprises. In the manufacturing sector major industries like the automotive sector to small niches like naval equipment are analysed. Among our interviewees are R&D-intensive enterprises, with high-tech products for sophisticated customers and the pharmaceutical industry, as well as the food industry with lower importance for research and development. The following table gives a short overview:

Table 47: Selected cases for firm interviews

Country	Sector/Main product	Number of the case study ("O" = organisational innovation, "M" = marketing innovation)
Croatia	Pharmaceuticals	O1
Croatia	Naval/Shipbuilding	O2
France	Distributor of scientific goods	O3
Germany	Metal processing	O4
Norway	Insurance	O5
Netherlands	Electronics	O6
Spain	Naval/ Defence	O7
Spain	Organisational Development	OE1
Germany	Consulting, Expert for OI	OE2
Germany	Furniture industry	M1
Austria	Food industry	M2
Germany	Electronics	M3
Italy	Manufacturer of precision instruments	M4
Germany	Professor for Marketing at the EBS	ME

As can be seen in the table a great variance of branches and sectors is also covered by our case studies. There are enterprises in business to business markets (consulting, naval sector, metal processing, pharmaceuticals) as well as in business to consumer markets (electronics, insurance, furniture, naval services), some offering services, others producing goods.

Starting with organisational innovation the single case profiles are presented and supplemented with the expert interviews. The single case examination regarding marketing innovation is presented in section 5.3. The findings across the cases are described in the section 5.4, bringing together the cross case analysis for marketing and organisational innovation.

5.2 Organisational innovation – single case examination

The firm cases were chosen to cover the theoretical dimensions of organisational innovation (see chapter 2.3, OECD 2005). As defined by the Oslo Manual, organisational innovation is the *"implementation of a new organisational method in the firm's business practices, workplace organisation or external relations"*. **Business practices** include "organising routines and procedures for the conduct of work", **workplace organisation** covers "new methods for distributing responsibilities and decision-making among employees (...), as well as new concepts for the structuring of activities" and new methods for **external relations** "involve the implementation of new ways of organising relations with other firms or public institutions, (...) new methods of integration with suppliers". These changes aim to improve firm performance directly in terms of quality, flexibility, productivity or speed and can therefore be considered a **distinct form of innovation**. Also organisational innovation can function as an **enabler** for other types of

innovation, supplementing the implementation and use of other innovations, or as a **prerequisite** for knowledge accumulation within the firm by increasing the ability to acquire, create and make the best use of competencies, skills and knowledge.

Organisational innovation as a **distinct form of innovation** directly improving the firm's performance is covered by the example of a pharmaceutical enterprise (**O1**), which implemented new methods in workplace organisation to maintain its performance during fast growth of the enterprise. In the second case, improvements in the lead time of a shipyard (**O2**) aimed at defending the market position in complicated economic conditions of the naval sector. The third case shows the implementation of a standardised enterprise resource planning (ERP) software in the French subsidiary of a distributor for scientific goods (**O3**) to improve the entire business process and to provide a better service for the customers.

Organisational innovation enabling other types of innovation is covered by the case of a "hidden champion" in the cold forming of aluminium parts for the automotive industry (**O4**). To enable internal product innovation a dedicated staff position and new organisational structures for internal R&D were created. A Scandinavian insurance company (**O5**) implemented similar solutions to be able to turn customer demands faster into new products. The case of a world-leading electronics company (**O6**) shows a new approach to external relations to improve product innovations.

More indirect benefits of **organisational innovation** as a **prerequisite** for knowledge accumulation are also covered by our case studies. The case of a highly flexible "problem-solver" for naval equipment and defence (**O7**) shows new methods in the business practices for making the best use of their existing knowledge.

To cover the perspective of experts helping firms to change their organisational structures, two case studies with experts for organisational development and advanced lean production were conducted. The first expert is a Spanish organisational developer (**OE1**), helping firms to mobilise the employees by a change in the culture of the organisation to benefit from existing skills and knowledge. This type of organisational innovation is a prerequisite for the firms to improve their knowledge accumulation.

Another meta-perspective of an expert for organisational innovation (**OE2**) is derived from projects in advanced lean production and organisational change during strategy formation covering changes in the business practices, workplace organisation and external relations. In the case of the advanced lean production the focus is an improvement of the firm's performance. The methods for organising a strategic shift are a prerequisite for the knowledge accumulation during the strategy formation process.

The coverage of the ample dimensions of organisational innovation by our case studies does not allow any empirical conclusions about these categories. Following an explorative approach the goal was to open up first perspectives on the variety of organisational innovation guided by theoretical concepts presented in the Oslo Manual.

One of the benefits of the explorative approach using case studies is the possibility to show the intrinsic logic of each case and to analyse intertwined causal structures in detail. The innovation processes for the implementation of a new solution for the organisation can only be understood

against the background of the firm specific situation and framework conditions in which it was developed and implemented. In this way, every research project runs the risk of showing too much detail while losing the focus of a precise analysis of the single case. Therefore, the examination of each case was condensed to a short case profile. The description of the relevant environment of the enterprise in which the innovation took place sets the stage for the analysis of the problem, which should be solved by a new form of organisation. Challenges, external hampering factors and the lessons learned show first results relevant for the findings across the single cases.

To verify our interpretation of the firm interview results, the case profiles presented in the following were sent to the interview partners for their approval. Thereby the interpretation of the case studies was validated with the perspective of the participants in the projects.

O1 – Fast growing “gazelle” in pharmaceuticals

The first case deals with a fast growing pharmaceutical company producing generic prescriptive and non-prescriptive drugs (e.g. nasal sprays), dietary products, dermatological cosmetics and other health care products. Founded in 1991, the company decided to enter the emerging markets of the former Soviet Union and Eastern Europe, a strategy that turned out to be overwhelmingly successful, resulting in tremendous growth rates over the last 20 years. In 2011, export growth rate was about 16%, resulting in a total export share of 72%. During the past years, employment growth rates clearly reached double-digit percentages. Today, the firm has over 580 employees, of whom 63% have a university degree. As a result of its outstanding performance the average growth rate over the past 20 years was about 23%, placing the firm among the fastest growing and most stable firms (“gazelles”) in its home country.

Eroding of competitive advantage because of outstanding growth rates: being faced with a highly dynamic market environment the major competitive advantages of the firm lie in short product development time in terms of high product innovation flexibility to quickly satisfy arising demands in their Eastern European markets. Originally organised in a matrix-organisation, new demands were turned to product innovations in temporal project teams by direct and short communication channels between the employees to split tasks and responsibilities. However, this process organisation turned out to be more and more inappropriate against the background of the fast growing number of employees. The formerly informal, quick and short communication channels did not pay off any longer as the decision-makers were too distant to the rapidly emerging new working groups. While problems of internal communication, interfaces and responsibilities could be solved by ad hoc fire fighting in the past, they now act as severe barriers and hampering factors in the firms’ working processes. As a result, the average product development time increased and the firm ran the risk of losing its most important competitive factor, namely flexibility and speed of product development, due to rapid employment growth. To preserve its competitive advantage, the management board’s solution was to counteract the increasing formalisation and hierarchisation of the organisational processes with a bundle of organisational concepts aiming at process flexibility and employee empowerment. With little experience in the field of organisational innovation, the management board relied highly on an external consultant to develop its new organisational

solution. Besides a viable organisational structure, the main goal was to maintain the organisational culture with room for creativity and high involvement of the highly skilled employees.

Organisational structures for decentralised initiatives: in a first step, the firm developed structures for decentralised decision-making by implementing management by objectives in combination with dedicated areas of employees' responsibilities to create individual accountability. The goal was to leave sufficient room for creativity and a culture of a learning organisation, for example by discussing problems in regular individual appraisal interviews. Moreover, employees were invited to participate in future changes in the framework of an institutionalised, continuous improvement process. As another element within the bundle of organisational concepts, fifty employees became shareholders of the firm to create a long-term, stable organisational basis.

Given the high pace of growth, the management estimates the necessity for changes in the organisational structures implementing new solutions about every two to three years. Hence, organisational innovation is regarded as an instrument for coping with employment growth on the one hand, and as an enabler of future growth on the other hand. However, the growing experiences with organisational innovation have led to a fundamental change in the perception of this strategic instrument. In the past, organisational innovation was undertaken as reactive adjustments of processes to maintain the firms' competitiveness against the backdrop of fast growth. But nowadays, the firm increasingly recognises organisational innovation as a proactive strategic option to actively gain competitive advantage through purposefully designed organisational processes and routines. In the context of a stronger orientation to markets for non-generic drugs with preventive character in the future, the firm tries to achieve higher customer orientation by involving lead users in their product development process and making them a part of the company on behalf of a "customer-centered organisation". Hence, originating in a low awareness of organisational innovation as a competitive advantage, the economic impact of the changes already made is considered to be very high. Threatened by a deteriorating performance due to unorganized growth, the implementation of new organisational concepts was the only option to maintain functioning processes. The competencies from the changes implemented in the firm are now used to develop a new organisational structure as a proactive competitive advantage.

Organisational innovation as a field of learning due to missing information: due to the ongoing growth of the firm, there is a constant need for process adjustment through the implementation of new and the refinement of existing organisational structures. Although the management makes an effort to take care of the established networks and teams, the ongoing process adjustment, like every organisational change, leads to the break-up of social relationships between the employees and therefore causes some uncertainty among them. Hence, some employees have to get used to new persons of reference and team structures. The efforts to manage the related issues were underestimated in the beginning. Another point that was not taken into consideration was that organisational innovation in contrast to new production machinery is a subject of constant improvement, adaption and fine tuning in order to obtain its full economic effects that might last for a couple of years. Besides the problem that the direct and indirect costs and benefits of organisational innovation, until now, cannot be adequately captured by quantitative measurement, another problem is seen in the lack of management and leadership skills of graduates and young employees coming from the educational system in the country. This is recognised as a severe

problem, as decentralised organisational structures require a certain degree of such skills to be successfully implemented.

In addition, also the search for external information and knowledge in the field of organisational innovation is regarded as unsatisfactory. While planning the organisational changes it was difficult to find and choose the appropriate professional support. As the firm states, neither at the national nor the European level is there sufficient transparency about which institution or consultancy has which competences concerning particular issues of organisational innovations. It was suggested encouraging the set-up of a platform for knowledge exchange on organisational innovation either on the European or even on a global level. Although the firm is largely familiar with the national and European programmes supporting technological measures, it has never participated in some public programme supporting organisational innovations. According to the company's opinion, such programmes are rather invisible and hard to find.

O2 – Shipyard specialised in services – Victor Lenac, Croatia

In the next case, new organisational methods were implemented to improve the lead time in order to defend the market position due to better customer service. The company is one of the leading repair and conversion yards in the Mediterranean Sea, providing specific solutions adapted to customer needs for ships of different sizes and types. In 2011 the company employed almost 600 people. It earns revenues of ca. 45 million Euros with more than 80% coming from foreign markets, in particular from the EU. From 2003 to 2008 it passed through a phase of insolvency, before the new owner decided to take over the business. The world's shipping market is currently faced with unfavourable trends. Due to decreasing freight rates in and after the economic crisis, ship-owners are facing hard times and try to postpone dockings as much as possible, or choose to do only the most necessary repair works, or even scrap relatively new ships. Against this background the ship repair market remains under pressure from low prices and lack of contracts. The shipyard's biggest competitors are located in Turkey and the Black Sea, these being the cheapest shipyards in the geographic region of the Mediterranean Sea.

Capacity-planning in the context of volatile incoming orders: in order to compete with low-cost shipyards in Turkey and the Black Sea as well as the increasingly volatile demand, the shipyard is faced with economic threats. As price competition represents no option due to the high labour intensity, the shipyard has to undertake great efforts to achieve superior flexibility and speed of maintenance services. As the ship-owners seek to reduce docking times, the duration of off-hire periods has become one of the most important competitive factors compared to the maintenance costs themselves. The requirement for flexibility is further aggravated by the fact that mostly in the case of flag of convenience ships, clear specifications of maintenance are often missing. Therefore, some problems only become visible when the ship is already docked. Moreover, technical specifications keep changing continuously. Furthermore, demand is characterised by almost unpredictable ups and downs, depending on the ships' routes as well as due to postponed or cancelled repair orders. Therefore, to maintain competitiveness, the management board decided to compensate these circumstances by organisational measures to increase the

efficiency, flexibility and speed of working processes and thereby to offer its customers a cash value advantage by shorter docking times and by decreasing costs for production activities.

Matrix organisation for flexible and efficient working processes: according to the problems mentioned above, the main objectives of the re-organisational efforts were to cut down the lead times significantly, to respond faster and more efficiently to customer needs and to decrease the overall production costs by improved coordination and by the eliminating of not added-value-activities. For this purpose, a matrix-organisation structure was developed by the top management and implemented, to cope with the project-driven business processes. The matrix organisation is characterised by low levels of hierarchy, and, even more important, allows for flexibly joining the required competences and knowledge within the service projects. Therefore, the necessary tasks of simultaneously ongoing projects are divided into single work packages which build the basis for work scheduling and controlling. Within the implementation of the organisational innovation, each workplace and work package was systematised and standardised regarding its tasks and responsibilities. Besides the increased flexibility in combining different work packages and tasks, the division into work packages also allows for improved controlling measurements to increase efficiency. However, the implementation of a functioning overall controlling system to assess the efficiency of each single working task is still in progress to date. To supplement the standardisation of workflows, the entire information and communication system has been modernised for further standardisation of information flows and coordination processes. Although the effects of the new organisational structures have not been fully assessed because of missing financial or process performance indicators to date, the firm states that there first positive effects can be observed in terms of an increased flexibility and efficiency of working processes. Nevertheless, there is still a long way to go. Although not yet a full success story, the firm representatives also emphasise that the organisational innovation guaranteed the shipyard's survival in the difficult market situation.

Discrepancy between theory and practice: although the organisational innovation project is considered to be of the highest strategic importance, its implementation process was not treated as "a real project." The complexity of the whole restructuring process was not seen at the beginning of the process. The requirements for the future organisational structure had to be developed step by step arising from daily problems, so that the implementation process was not supplemented by a detailed plan or a devoted budget. In consequence, employees were not informed about the changes to a sufficient degree and the necessary qualification of the middle management to work and lead in the new organisational structures was neglected. Likewise, the overall qualifying needs for reorganisation to such an extent were strongly underestimated at the beginning. One major bottleneck is seen in the lack of practical know-how of how to plan and implement such an organisational concept. Despite the abundance of theoretical literature on management concepts, they say little about the processes of implementation. However, the firm could hardly imagine that there are no other cases of firms out there that already have successfully realised such a concept from which the shipyards could have learned. The problems encountered could have been avoided if a knowledge platform had been available that allowed for an exchange of experiences on and diffusion of organisational concepts between firms across different industries.

O3 – Distributor of scientific goods, France

The following case is about an ERP (Enterprise Resource Planning) change in a distribution company. The company distributes scientific products and equipment to biotechnology and pharmaceutical companies, universities, hospitals, medical research institutions and process control industries. Being the French subsidiary of an international corporation, the firm generates revenues over 100 million Euros with more than 200 employees. More than half the staff can be considered as highly qualified managers or highly qualified scientists.

A multi-plants issue: the firm works with different IT management systems in most of the European subsidiaries. This is the result of a long process of mergers and acquisitions. For many years it was not possible to connect the different data bases and different IT systems within Europe. The purpose of the examined project is to use only one data management system in all European entities. Expected improvements are an overall shortening in delivery times, and a better match between customer needs and services provided by the firm. The firm expects to increase its revenues of 5 to 10% faster than the market. The employment effects are expected to be neutral. Similar projects have already been launched in the past, but they were all cancelled at an early stage, due to a lack of convergence between the various internal stakeholders, a lack of internal sponsors and an insufficient requirements definition.

A self-funded two-year project: the project already started in 2009 with the creation of a dedicated full-time project team. More than 30 employees were selected all over the European plants as “experts” in their process and recruited to be part of the project team. They started to work full-time on the implementation process for the ERP software, being guaranteed a return to their initial position. Fifteen people were recruited from the subsidiary in France (i.e. half of the whole dedicated project team). New talents were hired to replace these people in their business functions while the project was running.

About 30 external IT consultants were also part of the project team, which was working independently at the beginning. Gradually, all employees were involved at various levels, because an ERP change means a radical change in working methods for every process of the firm: taking orders, managing inventory, managing carriers, invoicing clients, etc. Following recommendations of the project team, training sessions were organized for identified “key users” before the new system was started. The goal was to have many employees already mastering the new system at the actual change-over. The rest of the staff was trained later. Numerous temporary coworkers were hired for this period to mitigate the impact of a new IT environment and of new processes on productivity.

The great amount of internal resources used for the project was not supplemented by public funding. In fact, the firm did not even try to get public funding for this project, as the management knew that the topic of the project did not really fit in with any public grants criteria, and they did not want to waste time by creating a grant file. Moreover, the necessary cash flow was available within the corporation.

The old system was shut down and the new system was going live for the entire firm over a weekend, to limit the impact on customers of the system migration. This process was conducted by

70 additional participants of the project such as external consultants and managers from the parent company. However, French labour law did not allow a flexible arrangement of the working hours for this weekend. Even if both stakeholders (employees and employers) agree, it is complicated for the firm to claim an “exceptional situation”, to justify the change during working hours. The last two weeks before the migration, a lot of last minute issues came up and could have jeopardized the timing of the project. The really important work of prioritization was done during this period. It was unthinkable to reschedule the migration date at the last moment. Leaders chose to focus on the major processes of the firm and to prepare backup solutions for anything that would not be ready at the time. Involving the local managers was critical at this stage of the project, in order to generate a positive synergy among employees and maintain a high level of motivation.

Current status: the core business of the firm (taking orders, sending parcels and invoicing clients) was operational with the new system from the implementation on. Nevertheless, in the early weeks after migration, numerous anomalies were pointed out by employees. Especially as regards to unusual, but common, cases: specific products or customers with unusual needs, etc. Operational leaders did a daily incidents review, to prioritize resolutions. Most of them were solved within 2 months. It paid off that customers had been informed early about the new ERP system and were partly involved in the planning process.

Experiences with the benchmarking of such projects show that it takes between three and twelve months until the positive effects become fully visible. Still, a high level of vigilance has to be maintained after such organizational change, to be able to react quickly to problems and maintain a high service level to customers.

O4 - A “Hidden Champion” in the cold forming of aluminium parts for the automotive industry, Germany

In contrast to the three firm cases discussed before, this case shows the linkage between organisational innovations as an enabler for other types of innovation, in this case product innovation. This case is set in a family-run company in the metalworking industry with about 200 employees, located in southern Germany. As a supplier for the automotive industry the company mainly manufactures cold formed aluminium parts and components. To date it has become the international market leader due to the outstanding precision and quality of the parts. Moreover, the company has established itself as a technical process specialist who is able to develop and realise complex technical process solutions in the field of cold forming. Thereby, the firm has increasingly become a technical consultant for some of the big German automobile manufacturers during recent years. Against this background, it appears even more remarkable that the firm performs only occasional R&D activities and can be characterised as non-R&D-intensive. Instead, the competences relevant for its innovation ability and competitive success are mainly rooted in the huge stock of practical and experienced-based knowledge. Due to its positioning in the value chain, most innovation projects are triggered and driven by customer requests, which frequently arise from the day-to-day business. To cope with these external requests, the organisational processes have been adapted correspondingly.

Dependency from customer-driven innovation projects: while the customer-initiated innovation processes have been functioning very successfully during the past decades, however, the firm recently faced two serious challenges: firstly, because the German automotive industry was badly hit by the recent financial and economic crisis, the firm experienced massive decreases in their incoming orders. The owners realised that the strong customer dependency with regard to innovation projects as well as the corresponding internal process organisation of innovation projects could lead to a dead-end road, because too much of their “own” innovation ideas remained unrealised and got stuck in the stream of customer requests. To increase their resilience against future economic downturns it appeared necessary to build up additional business areas by actively pushing forward their own ideas and innovation projects in the future to unlock new markets and customer groups. Secondly, the firm sees further need for action because the technical manager, who has been the innovation mastermind, will retire within the next few years. Hence, to maintain and secure the firm’s innovativeness and technical competence which has hitherto been concentrated on just a few shoulders, it appeared necessary to establish a more systematic innovation process which is institutionalised for a larger group of employees.

Setting-up a systematic and sustainable organisation of the internal innovation process: to develop and implement a suitable solution for these problems, the company decided to collaborate with an external research organisation in the context of a publically-funded research project on innovation management. During a series of joint workshops with researchers, the firm identified those phases in its innovation process where their own ideas and solutions got stuck or petered out in the past. Based on this insight, they reorganised their innovation processes into two distinct areas: 1) “customer-driven” innovation processes, and 2) a “self-initiative” area of ideas and innovation projects triggered by the firm itself. While the customer-driven process remained largely unchanged, the innovation process of their own ideas and projects has been systematised by the identification and definition of specific tasks and organisational interfaces between internal departments as well as external partners at each stage, from the development of ideas to the start of serial production. Moreover, to fill the new systematic innovation process with life, the firm decided to create 20% of new management personnel capacity within the organisation: 1) a “process innovation manager” responsible for the whole field of new technical process innovations, and 2) a “product innovation manager” caring about the realisation of new product developments. Both innovation managers are strictly detached from day-to-day business. Instead, they have to secure the persistent performance of those innovation projects resulting from the firm’s own ideas by bringing together the necessary knowledge from inside and outside the firm, dealing with issues of standardisation and regulation, and taking care about the right “timing” of the innovation processes. However, both roles require highly skilled employees who are able to identify, coordinate and connect different internal and external sources of innovation knowledge. Besides certain technical competences, these roles thus also require high communication skills, a good knowledge of firm-external networks of possible collaboration partners as well as sufficient information about market demand and customer needs. Although these criteria require plenty of experienced-based knowledge about the specific firm setting, none of the existing staff was able to fulfil these requirements due to the lack of formal technical qualifications. On the other hand, while employees who meet the necessary technical qualifications were available on the labour market,

they of course lacked the firm-specific knowledge and experiences. Nevertheless, the firm decided to hire two highly skilled employees with a mechanical engineering background. Most importantly, to compensate for their missing firm-specific knowledge in the beginning, the firm and the research organisation jointly re-designed the organisational framework and processes in such a way that the new innovation managers became closely embedded in the existing workflow and team structures in order to accelerate the transfer of the necessary experience-based knowledge.

Overcoming structural inertia by participating in a public research project on innovation management: this case is mainly characterised by an organisational lock-in of its internal innovation processes due to its high customer dependency. While this lock-in situation has been recognised by the firm itself drastically during the past economic crisis, the risk and uncertainty of the necessary fundamental re-organisation of their own innovation process was considered so high that the firm decided to make use of public policy support in order to cope with the necessary investment costs.

Moreover, due to the lack of knowledge and information and a lack of suitable, instantly useable innovation management concepts for non-R&D-intensive enterprises, the firm was not able to develop and implement the organisational innovation on its own. For this reason, they decided to collaborate with a research organisation having expertise in organisational innovation and the design of innovation processes.

In the implementation phase of the new process organisation of own innovation projects, the firm was confronted with the lack of sufficiently qualified and experienced personnel on its internal and external labour market. Especially the lack of the necessary experience-based knowledge about the firm-specific context and its working processes was recognised as a major barrier when recruiting new employees, because bringing new organisational processes successfully to life requires in-depth knowledge about the firm's peculiarities.

O5 - Leading Insurance: from market information to new products, Norway

Confronted with a similar task to case O4, a Scandinavian insurance company developed innovative organisational structures to facilitate product innovation. As a major actor in the market, the company offers insurance products and services for three segments of users: private persons, SMEs and industry, profiting from the growing demand for cross-country insurance services, which is one of the companies' new areas of specialisation. Hence, the market position is challenged by increasing competition from new actors. New products and combinations of products and services in the insurance business are hard to protect by intellectual property rights since they are exposed to competitors the very moment they are launched in the market. New ICT-solutions have also made it easier for costumers to compare insurance products and prices and switch to the company which provides best value for money.

Integrating innovative behaviour into the organisation: as one of the leading companies in the Nordic insurance market, new products and services are quickly copied by competitors. The competitive advantage therefore lies in credibility and fine tuning of products and services to meet

customers' demands. One particular concern is to transfer the knowledge about customers' needs and preferences from front line sales persons to product developers and strategic management. In a large and complex organisation it is, however, always a challenge to establish an innovation culture where ideas flow between different departments and business areas.

According to the company, strategic knowledge is also hard to find and purchase from external sources. Hence, most new ideas will have to come from within the company. A constant focus on innovation through the whole organisation is therefore a major concern. As our respondent put it "there are a lot of half-baked ideas around, which need to be turned to new products and services". This requires cooperation across different departments in the company. Central management has therefore encouraged all parts of the organisation to come up with so-called "business initiatives", which are new business ideas from combinations of internal know-how and experience.

Building a culture and competencies for completing half-baked ideas: to strengthen the internal innovation processes in terms of professionalisation and systematisation, the company has started a specific innovation training programme as part of the internal business academy. The first round of this competence-building comprised a 9-month innovation training course for 25 selected employees. After finishing the course, the employees are spread to different parts of the organisation as a sort of innovation facilitators. The idea is that they should contribute to integrating an "innovation mindset" in different parts of the organisation. The employees also have an internal network, where they exchange ideas and experiences from various innovation projects in different parts of the organisation.

The initiative was started quite recently and will be followed up with new generations of "Innovation facilitators". It is therefore difficult to assess the effects or draw any conclusions about the results of the effort. However, there are signs of strengthened linkages between customer support departments and product developers. The company has also started to develop a more systematic and frequent series of workshops around the development of "half -baked ideas". Employees from the innovation course are central in this initiative. At the same time it is clear to the company that there is no quick fix for developing an innovation culture in the entire organisation.

Organisational innovation to keep up with competitors: as products and their "construction" are completely public in the insurance sector, product innovation loses its value quickly. Confronted with customers able to evaluate different products via Internet, the only chance to defend the market position is to include new customer needs in the product portfolio faster than competitors. Therefore organisational innovation can be considered an important enabler for product innovation and thereby compensates partly the externalities for product innovation due to imitation by competitors.

O6 - World-leading electronics company with a strong record in technology-enabled innovation, Netherlands

Confronted with fast changes in the relevant markets, the company in the next example did not choose internal solutions as in the cases O4 and O5, but reorganised their external relations to improve on product innovations. Being a globally recognised enterprise with products in consumer electronics, healthcare and lighting, the firm intended to augment its absorptive capacities in a technologydriven market by closer collaboration with other enterprises, especially start-ups.

R&D and technology-enabled innovation have been central throughout the firm's history, lasting now for more than 100 years, and resulted in a number of ground-breaking inventions. The firm undertakes early-stage R&D activities together for all company divisions in a separate company division. These include all the steps from spotting trends to proof-of-concept and sometimes even range into the phase of product development. This commitment to R&D, which is visible in the large R&D investments, can be seen as the firm's competitive advantage.

Explosion of complexity and speed: in the last two decades the technological and market environment of the firm underwent enormous developments, which created pressure to react. After the rapid expansion of the technology palette with the rise of e.g. micro-systems technology, the explosive growth of applications based on electronics shifted the focus from a technology-driven to a market-driven approach in innovation. The enormous acceleration of the markets called for an increased speed of innovation processes, especially because business start-ups seemed to be more effective in reacting to these developments than a large organisation trimmed to providing technical solutions.

Opening up the research laboratories to strategic partners for innovation: under growing market pressure the knowledge base of the R&D department needed to be supplemented with the input of new partners. To augment the absorptive capacities, a loose form of cooperation was created: the firm has initiated an open innovation campus next to its research laboratories, making available technical and service facilities and offering its technological experience and contract research opportunities to the partners on the campus. Since opening up its research laboratories site to other technology companies, research institutes and service companies in 2003, the campus has evolved into an open innovation ecosystem with more than 100 companies, including some 40 start-ups. In addition, cultural and disciplinary backgrounds of the people working on the campus are highly diverse. The companies and research institutes cooperate closely in pre-competitive research and development, share technical facilities and the services of companies in financing, creativity etc. The exchange of people's knowledge and experience on a personal basis is facilitated by many facilities to meet, such as restaurants, shops or a fitness centre, as well as conferences and other events.

Understanding open innovation as an organisational change of processes by adding external approaches to innovation to the existing internal ones, the firm seeks to realise benefits from open innovation. This is achieved, for example, by the following outside-in aspects: leveraging basic research knowledge from universities, which are not directly part of the campus, but strongly linked to it; identifying business opportunities and the transformation of a research project into a new

business by exchange and collaboration with start-ups, and also crowd-sourcing, using the “wisdom of the world” represented in the multi-national, multi-cultural and multi-disciplinary knowledge of the people working on the campus.

Among innovation and regional development experts, the open innovation campus is seen as a success story. It is acknowledged that the different types of people and organisations on the campus facilitate a creative, encouraging and innovation-friendly environment. Moreover, the change from a technology to a market-focused culture is facilitated. Nearly 50% of all patent applications in the Netherlands stem from campus companies. Additionally, the synergies from sharing the facilities offer cost-savings for the firms, in particular for the initiator of the campus itself. The company perceives the open innovation campus as accelerating innovation and offering a broader view: not only on R&D but on the whole innovation chain.

Skills, intellectual property rights and the need for cultural change: despite the positive developments, there are also hampering factors when introducing open innovation as a new and additional process to the firm’s innovation approach. The benefits from entrepreneurial talent were lower than expected, in particular entrepreneurs who combine technological knowledge, business knowledge and a readiness to take risks are hard to find. Furthermore, different approaches to intellectual property rights turned out to be deeply rooted in the culture of the enterprises, although there is an increased interest in knowledge valorisation – in particular in universities. Thus, in research partnerships, control of IP becomes more and more an issue of conflict, where large companies insist on a good IP “management” and formal agreements, and SMEs rather perceive the big firms to be in want of full control of IP rights. Therefore open innovation seems to be limited to pre-competitive research.

O7 – Highly flexible “problem-solver” for naval equipment and defence – Fluidmecánica Sur, Spain

The next case shows organisational innovation with a more ample purpose. Organisational innovation in this case is not linked directly to another field of innovation, but aims to make the best use of the existing knowledge, in a flexible projectdriven environment.

The enterprise is a highly specialised but still diversified “problem-solver” in the field of naval equipment, defence and process technology. 115 employees create revenues of about 12 million Euros, 20% of the staff can be considered as highly qualified. Forming a network with an associate company, it offers integrated solutions from the initial technical design, the assembly including the production of minor parts up to the delivery and implementation of customer-tailored solutions and the maintenance of these solutions. Single parts of this portfolio are also offered, such as, for example, the overhaul and maintenance of naval equipment and weapon systems.

To be able to provide the diversified product portfolio, the firm is organised as a projectdriven matrix-organisation. Interdisciplinary project teams with highly qualified staff have full access to the resources provided by the organisational divisions. The competitive advantage of the enterprise is based on the flexibility to provide customer-specific solutions in the form of prototypes, single pieces or specialised services.

Organisational innovation in a flexible project-driven environment: in this case, the organisational innovation has to happen within a highly flexible, project-driven matrix-organisation. While there are no fixed process structures, new organisational methods are implemented to improve the knowledge accumulation, but also to augment customer satisfaction and innovative capacities. Not being thematically limited, as in the cases mentioned before, organisational innovation can be mainly understood as a prerequisite for knowledge accumulation. The competitive advantage to satisfy complex customer demands by unique solutions making it almost impossible to gain efficiency by standardising business processes as a typical organisational innovation. The management still considers improvements of the organisational processes as contributing significantly to the competitive capacities of the enterprise and to the satisfaction of the customers in the long run.

Therefore an annual workshop is exclusively used to identify weaknesses within the business processes. Out of this workshop, project teams are constituted to implement new organisational structures or procedures ranging from software for knowledge management to certifications for organisational structures, such as DIN 9001, to improvements in communication with customers, like systems for video conferences and for the 3-D presentation of virtual prototypes.

New solutions, including 3-D presentation of virtual prototypes or improvements in the complaint management, can justify their costs with direct added value for the customers. Long-term projects such as the knowledge database in contrast compete directly for internal resources for customer orders. This is strongly reinforced by the high costs of developing a functioning knowledge base for a flexible matrix-organisation that has gathered knowledge about complex technological systems for years. There are no software solutions on the market which meet perfectly the needs of the organisation. Instead very powerful software systems have to be adapted to the organisational structures, resulting in great efforts to adapt these to the company and to fill the database. These efforts to fill the organisational innovation with life and thereby creating real revenues have no dedicated "organisational spot", so that the pressure of daily business directly reduces the progress of organisational innovation.

Internal resources for organisational innovation: given the flexible organisational environment of a matrix-organisation and the highly specialised niche of the enterprise, there are no easily applicable solutions to the organisational problems of the firm. Therefore, the highly qualified staff is working on new organisational solutions while scarcely using any external resources from business associates, like IT infrastructures or administrative support. This fits in with the culture of the enterprise, as a "problem solver". The necessary know-how is created within the enterprise just like it is created in the daily business of product innovation to meet customer demands.

In that constellation organisational innovation is competing with the resources for product innovations to satisfy customer needs. While working for customer orders generates revenue in the short run, the revenues of organisational innovation have a longer time scale. The organisational innovations are implemented in a slow process, whenever the capacities of the project-driven business allow time to be spent on changes in the organisation. The knowledge database, for example, is considered to be in use just for 20% of its full potential. Additionally the enterprise applies for public funding, whenever possible, to improve the relation between costs and benefits

of organisational innovation. The broad range of funding programmes is considered to be open for organisational innovations and specialised agencies offer their services to cope with the administrative side of these public subsidies, but the long period until the final approval delays the projects.

The management of the enterprise sees organisational innovation as a necessary precondition for economic success in the long run. The high costs due to the necessary adaption of organisational innovations to the flexible and complex structure of the enterprise impede the institutionalised improvement of fixed organisational structures. Instead, flexible projects are conducted. The operative business of project-driven product innovation tends to compete for the same resources as projects for organisational innovation.

Allocate internal resources for individualised solutions: the lack of solutions which are easy to implement into the highly flexible organisational structures, led to high internal efforts for organisational innovation. There are no solutions on the market for organisational innovation, neither consulting nor new technical solutions, which fit the needs of the enterprise. The specificity of the branch and the organisational structures result in coordination failures and the lack of market-offered solutions for organisational innovations. Still, the organisational structure emerged from market necessities for prototypes, single pieces and specialised services, a path which renders strong formalisation and standardisation processes impossible. Given the niche of the enterprise, their market for organisational innovation is always too small to attract specialized suppliers and networks allowing for the development of tailor-made solutions.

In the internal competition for resources, the uncertainty about the revenues of organisational innovation determines the predominance of customer-driven product innovation. Due to the incomplete information about the revenues, the internal market for resources is not able to guarantee the development of new organisational solutions on an institutionalised basis.

OE1 – Organisational Development: changing the culture of organisations – K2K Emocionando, Spain

The following case is about changes in the culture of an organisation as a prerequisite for knowledge accumulation. Specialising in changes of the organisational culture, a Spanish consultancy has realised a fundamental change in over 25 different organisations to enable them to work in self-organising teams for a further rationalisation of the business processes, for innovative products or the penetration of new markets. The broad range of organisations including enterprises, cooperatives, foundations and even the local administration, shows a high applicability of the concept of this new style of relations: "What we change is the relationship between all the members within an organisation." The central element of the new style of relations is a fully transparent and democratic process to decide about organisational changes. The members of the organisation decide with equal votes which strategic changes should be implemented. All important decisions about investments, wage cuts or overtime are made by a assembly of all members of the organisation. That includes the management and the owners being represented

with one vote per person just like any other member of the organisation. With a more hierarchic tradition of organisation in Spain still intact, the management is confronted with severe problems to mobilise the employees for commitment beyond the completion of existing routines. In the environment of a deeply depressed economy and with the growing importance of business processes based on self-organisation, the involvement of the staff becomes a critical asset.

Convincing the organisation: attracted by the positive experiences of other organisations, the firm management contacts the organisational developers in order to acquire external knowledge and information about the concept. This is done not only by a presentation, but also by the possibility to visit other enterprises, which were reorganised earlier. Without any members of the consultancy present, the management gets the chance to inform itself at first hand. If the management, respectively the owner, agrees to start the reorganisation, the employees are informed in the same manner, including the possibility to talk directly with the employees of organisations with the cultural change already implemented without any members of the consultancy or the management present. The project starts only if a very high share of around three out of four employees votes in favour of the project: "If thirty percent of the employees do not want the changes, it will be very, very difficult and complicated to implement them."

The reorganisation: transferring the strategic decision-making to an assembly of all members of the organisation, the basis of information about the performance becomes crucial: "Enterprises need to be efficient". Therefore the explanation of key performance indicators is given a high importance and after a first introductory meeting a monthly review of the development of the organisational performance is made.

The mobilisation of the employees is based on a common vision and self-interest at the same time. The cornerstone of the reorganisation is the redistribution of gains to the employees. Depending on the type of organisation, between twenty and thirty percent of the savings realised in reorganisation projects are paid as a bonus to all employees. The cost of an improved involvement of the employees is paid at the moment when it pays off; the balance sheet of the enterprise is not charged with additional costs. The work to be done in the projects approved by the assembly is organised in teams. The project groups elect their leader, who is responsible for the agreements with the other groups.

This new bonus and organisational structure is complemented with symbolic changes of the organisation to create a common vision of a participatory organisation. Elements of control like an attendance clock or employees in controlling functions are reduced and the wages are grouped for a more equal payment scheme, guaranteeing that no one will earn less than before and the annual losses due to inflation are compensated automatically. The resulting atmosphere is strengthened even more by social projects organised by the employees. Besides these changes, all the organisations that underwent this cultural change cooperate in more projects under the guidance of the consultancy. For instance, the supply is done collectively in some fields to augment the buying power to negotiate more favourable prices.

Still, the new compromise stays fragile; the project can be abandoned at any time during the project by all three stakeholders, the employees, the management and the organisational developers. This happened already in three cases, one time for each stakeholder. While in one

case the owner was discontent with the assembly and in another the trade union objected to transferring their influence from a committee to the assembly, in the third case the consultants abandoned the project due to a mutual blockade of the stakeholders. Most interestingly, most of the agreements made in the assembly cannot be formalised in a contract, because there is no legal basis for a binding contract. This does not mean they are illegal, but operate in a legal limbo.

Barriers and lessons learned: the projects of cultural change are driven simultaneously by a vision of a different kind of organisational culture and self-interest. Entering into enterprises with a still quite hierarchic tradition, the improved participation of the employees mobilises hidden capacities. The change in the behaviour of the employees cannot be attained by simple pleas. The environment needs to change accordingly to the new culture, a participatory organisation needs to involve its employees in the decision-making and share the benefits of the efforts for a better performance. Even though the projects under consideration in this case deal with internal barriers, it shows the variety of organisational innovation and especially their social embeddedness. Organisational innovations, mobilising the staff as a prerequisite to augmenting the absorptive capacities, are strongly confronted with social complexity.

OE2 – Expert interview: consultant for advanced lean production and strategy formation – Gitta mbH, Germany

The expert for organisational innovation has been working for over a decade in projects for advanced lean management and strategy formation. Among their clients are large enterprises as well as SMEs, assignments from the management and from employee representatives as well. This variety of constellations allows for a broad overview of these types of organisational innovation regarding the frame conditions and success factors. Confronted with the operative implementation of production systems and the perspective of strategy formation, the expert oversees the micro-level as well as the meta-perspective of these types of organisational innovation.

Fields of work of the consultant – production systems and strategy formation: in the manufacturing sector, many enterprises try to implement production systems seeking similar success as Toyota. To do so, the production is reorganised by using different methods, like “value stream mapping”, “kanban”, “u-cells”, etc. in an integrated manner as a kind of advanced lean management. Coming from multicorporate enterprises in the automotive sector, these production systems are often codified in manuals as a guideline to the streamlining of the production in the single plant. As a result, the local plants are over-burdened with the application of the abstract methods to their shop floor. Therefore dedicated staff from the corporate headquarters or specialised consultants support the implementation and adaptation of the production system. Confronted with the complexity of such a reorganisation project, many questions, especially about the working conditions and the workers’ participation, need to be answered. The consultancy of the expert is therefore strongly active in this branch of organisational innovation. This also includes the networking between employee representatives of different firms with these advanced lean production systems.

In the other working field - projects for strategy formation – the focus is to identify internal resources, which might be a competitive advantage. The consultancy helps to organise and moderate the project groups, which analyse the market position of the enterprise. Guided by that analysis, a plan for the future development of the firm is designed and transformed to projects for further change. Besides the moderation and support for the self-organisation of the teams, the communication and activation of the employees during changes of the organisation is a focus of work for the consultant.

Resources and the perception of risks and revenues: most of the clients have already decided to implement new business processes or new forms of workplace organisation due to growing problems with the existing structures when they ask for the support of the consultancy. Organisational innovation for these types of reorganisation is rather reactive than proactive. This might also be rooted in the lack of knowledge about organisational innovation within most of the firms. When starting a project, the management normally follows the idea for instance of streamlining the production towards an integrated lean production system or to start a process of strategy formation, having just little knowledge about the necessary operative changes and the effects in the day to day business processes. Some of the large firms have central staff positions focusing on organisational innovation, which provide internal know-how on organisational change for the subsidiaries. Smaller enterprises in the industrial sector normally have scarce resources so that they do not have dedicated structures or positions for organisational innovation.

In this situation, consultants play an important role in supplementing the implementation of new organisational structures with their knowledge from other firms. From the perspective of the consultant, the majority of the costs arise from the adaptation of abstract concepts towards working business processes: “The issues arising from the implementation are underestimated.” The adaptation of the concepts has to happen within the organisation and relies on the intimate knowledge about the organisational processes and thereby on the knowledge of the employees. Still, the consultants supplement these processes with efficient change management based on their experience.

The adaptation of organisational innovation includes complex and uncertain processes, impeding formalised cost-benefit analysis: “Sometimes there are standards when writing down a project plan and there you need to write down: ‘what do the projects cost and what benefit is there?’ (...) My perception is, that (...) all participants know that this is just a preliminary estimation of economic effects and benefits.” But even after the implementation, it is complicated to calculate the direct contribution of an organisational innovation. The consultant estimates that it takes between two to five years until the first achievements become measurable. Major companies use elaborated assessments in the field of advanced lean production to track the results of the implementation of their production systems within the single production sites.

Funded projects and the absorptive capacities for organisational knowledge: the expert considers the funding programmes for innovation in Germany to have a broad scope and to be open for organisational innovation. Hence this support for organisational innovation is linked to a campaign which has been started recently; the future development depends on new programmes, which proceed to supplement organisational innovation. In the opinion of the expert, such programmes

sometimes have problems transferring organisational knowledge from the scientific community to the firms. The academic language on the side of the researchers has no counterpart like a “department for organisational change”, especially in SMEs, as opposed to technological innovation with dedicated departments of engineers using a common technical language. In the projects of the consultant, the firms show little absorptive capacities for turning new strands of research about efficient organisational concepts into innovative structures. In most cases, the researchers are looking for enterprises to cooperate within funded projects on innovative organisational concepts and not firms looking for their topics in recent research.

Although funding programmes change the cost-benefit relation, there are few free-rider effects: “I do not know any project where one could say: ‘it would have happened anyway and now there is a clever funding.’” The risks and the unclear benefits of the implementation of new organisational structures reduce the incentives to introduce organisational innovation without being driven by threatening scenarios. From the consultant’s perspective, these urgent organisational problems, which drive organisational innovation, collide with the time-consuming approval process.

Summary: organisational innovation as a reactive adaptation: although hard to measure, organisational innovation in the working fields of the expert clearly has positive effects on the economic performance of the firms. Although the costs for the implementation of organisational innovations vary, the blueprints for new business processes or workplace organisations can be transferred between the firms. If organisational innovations can be used easily by competitors, the enterprises tend to protect their know-how by secrecy.

Still, in the perception of the expert, the firms have a rather reactive pattern regarding organisational innovation, which might be rooted in a narrow perspective on organisational change as an overthrow of working structures. Mainly disruptive and profound changes due to a crisis are associated with the idea of organisational innovation. The expert sees a need for more awareness of simple examples of successful organisational innovations to show that new methods for the business processes can be a competitive advantage and should be implemented proactively.

5.3 Marketing innovation – single case examination

The selection of firms, presented in the following section, was guided by the theoretical perspective on marketing innovation (see chapter 2.3, OECD 2005). As defined by the OSLO Manual: “A marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing. Marketing innovations are aimed at better addressing customer needs, opening up new markets, or newly positioning a firm’s product on the market” (OECD 2005). The mentioned dimension could be analysed by new methods for the **communication flows** from the firm into the market and from the market into the firm, **new distribution channels** and the appeal of the product by **changes in design and pricing** (see chapter 2.3). Changes in these dimensions of the market relations of an enterprise influence the firm’s performance at different levels. Marketing innovation can be considered **as a distinct form of innovation** which **directly affects firm performance**. New marketing methods can be an ‘**amplifier**’ of other forms of innovation by supplementing product

innovations. Marketing innovations for flows of information from the market to the firm can function as a **prerequisite and source for knowledge accumulation** and organisational learning.

Marketing innovation as a **distinct form of innovation**, which directly affects firm performance, is covered by the case of a manufacturer of office furniture (**M1**). The creation of a public brand as a new instrument for advertisement aimed to contribute directly to firm performance by improving the sales of an existing product.

Marketing innovation as an '**amplifier**' of other forms of innovation is covered by the case of an enterprise (**M2**) developing new marketing methods to represent their new approach to chocolate.

Marketing innovation as a **prerequisite and source for knowledge accumulation** is presented in the third case - an enterprise engaging in the social media (**M3**). Even having long experience with professional audio equipment, a necessary prerequisite for success in serving the new customer group of ambitious domestic users was new information flows into and from the target market.

The case of an Italian manufacturer of weighing systems (**M4**) shows the implementation of professional marketing structures in a technologyfocused firm. Projects to boost the sales of existing products through new marketing strategies aim **to directly improve** the turnover and thereby the **economic performance**. Using new structures and procedures for market research, the targeting of newlydeveloped products was improved, **amplifying their market impact**. Newly set-up structures for e-commerce had very little impact on the sales, but turned out as a valuable **information source for knowledge accumulation**. Overall the marketing innovations had a multidimensional impact on the firm.

The firm case studies are further supplemented by the meta-perspective of an expert on marketing innovation (**ME**), to get a glimpse of trends in the field of marketing.

Likewise for organisational innovation above, this section provides a short examination of the single firm's case profiles for the field of marketing innovation. These short profiles were approved by the firm representatives to validate the interpretation made by the research team.

By describing the firm-specific context in which the marketing innovation took place, these firm profiles set the stage for the analysis of the problem, which should be solved by a new marketing approach. The solutions developed are checked for the impact of hampering factors and similarities in order to open up perspectives on findings across the case studies. The findings across the cases will be presented in section 5.4, including the cases about organisational innovation.

M1 - Manufacturer of office furniture in the mid to premium segment – Topstar, Germany

In the first case the communication with new customer groups aimed to improve the sales of an existing product and contribute directly to the revenues. The firm has a long tradition in the production of medium-priced office furniture, but found itself under growing pressure from cheap office chairs from Asia. Efforts to streamline the production in the direction of lean production were started, but in the long run the cost competition would have been unwinnable and led to a lock-in

into a price competition. Product innovation was of little use in a technologically mature market, the development of fundamentally new technologies was not possible. In this situation the enterprise has chosen a totally new path in the branch of office furniture by creating a new public brand so that existing premium products were brought to the customers.

Getting existing products onto the premium market: while the enterprise was well established in the relevant distribution channels of retail sellers for office furniture by offering a good value for money with their medium segment chairs, the existing high class products had very poor sales. The retail sellers were reluctant to offer a premium chair without an established public brand which would boost the sales, not to mention the willingness and capacities for investing in advertising to get the premium chair onto the market for the firm.

Additionally, the chances of finding new customers for high-class chairs among the usual buyers of office furniture like general contractors or architects of office buildings were low, because there was little interest in the sitting accommodation of the future users. Instead, it was planned to turn the users of office chairs into customers. Building on earlier projects about the ergonomics of sitting, the growing awareness about health led the management to the conclusion to find well-funded customers amongst businessmen and freelancers, who would appreciate the design and ergonomics of the existing office chair.

The main problem was to by-pass the blocked distribution channels of the retail sellers and address potential customers directly. To transfer the information about the existing office chair to new customers, public branding seemed an adaptable solution in the struggle for attention. This was still a highly risky solution, as this had not been done before in this market niche and was reflected in a discussion within the two generation management of the firm : "What is the profit in that [public branding]?" "I don't know." "How much does it cost?" "I don't know."

Creating a new public brand for the premium chairs: given the great uncertainty of creating a new public brand named "Wagner" for premium office chairs, the strategic shift has benefited early on from the full commitment of the management to that project. The two chief executives of the firm participate up to the present directly in the steering of the new marketing. Driven by that commitment, significant financial resources were mobilized to create the new brand "Wagner", profiting from the good financial state of the firm.

However, the first presentations of classical advertisement agencies did not give reason to expect that the strategic asset of a new brand could be created by an external solution for a given budget. The experiences these advertisement agencies had made in consumer markets did not seem to be applicable to the market for consumer durables. There were no existing concepts in the branch of office furniture to start a public branding; the firm was the pioneer in this field. Thereby it was necessary to combine existing internal competencies on design and a deep understanding regarding what image would create a fit between the company and the premium office chair with the external knowledge of specialists for public branding, marketing events and brokerage for TV spots.

Starting with a budget rather small for advertising on television but large for a medium-sized company without any experience in this field of marketing, a first TV spot was produced and

broadcasted by a news channel with a high impact among businessmen. First attempts to advertise in magazines for businessmen did not turn out to be efficient, whereas flight magazines or architectural magazines had a stronger influence on sales. Communicating directly with a high number of customers at trade fairs became an important element of promoting the new brand Wagner. Two stand builders, employed directly by the company, were given the necessary resources to create a premium impression with the exhibition stands. Nowadays, marketing is further enhanced by strategic alliances to advertise together with other lifestyle products. Personal networks and connections to other enterprises looking for the same group of customers become a valuable asset.

The public branding of Wagner as premium office chairs became a remarkable success over the years: “In the first year not much happened, in the second there was a little improvement and in the third year it became interesting.” Sales of the top model rose from 100 to over 10,000.

Creating a new brand as a capital-intensive investment: the firm was still in a very healthy financial condition when the efforts for public branding started. This was a necessary precondition to the success of creating Wagner as a new public brand, because there would have been no access to external loans to finance such a risky project, where costs and revenues cannot be calculated. To cope with the risk of entering new fields of marketing it was important to locate the responsibility for the project by the top management. Although the growing competencies in marketing lead to higher efficiency in the resources spent on certain campaigns, uncertainty about the future strategy remains. Most interestingly, creating a brand needs to be considered as a capital-intensive investment, also costly for maintaining the attention created. The management sees no room so far to reduce the budget spent annually. Marketing needs to be considered a strategic investment and must be calculated to include the costs for the maintenance like any other investment, too.

M2 - New ways to chocolate⁵ –Zotter, Austria

The next case shows marketing innovation as an amplifier for an innovative approach to a well-known product: chocolate. The history of Zotter chocolate began some years before the enterprise was even founded, when Josef Zotter started to experiment and created a new kind of handmade chocolate. While the first business model of serving local markets with four pastry shops in Graz failed in 1997 (Khaire et al. 2011), the existing demand for extraordinary handmade chocolate showed the direction to the new focus of business: producing chocolate. Starting with a small production in 1999 the new chocolate creations, like “Cheese, Walnut and Grapes” or “Chili Bird’s Eye”, became a remarkable success.

5. As Zotter received a lot of attention for being an innovative company, there are already scientific publications about the enterprise. These publications are quoted since they provided insight used for this short description. Their findings had been supplemented by an interview conducted by the InnoGrips research team.

Asked about the secret behind the success of Zotter, Josef Zotter answered: "We are not just part 'ORGANIC' but totally, we follow the 'FAIR TRADE' principles not just in part but with full conviction, and we don't just pretend to produce chocolate but have the entire production process – from 'BEAN-TO-BAR' – in our house." (Zotter 2012a). The marketing strategy emerged step by step from the vision of a holistic approach to chocolate from bean to bar and shows deep linkages between different fields of innovation. The combination of new packaging, pricing, trademarks and even insourcing in the production led to a multi-dimensional marketing concept for premium chocolate.

How to position a new product in the premium segment: Zotter had to cope with the typical dilemma of premium products, or in the words of Josef Zotter: "To me it is weird that the tailor in Bangladesh produces branded products and cheap clothes in the same plant. Under these circumstances it is hard for me to determine what is the value of the brand? What does the brand stand for? (...) It would be easier for me to buy the chocolate from a supplier and just to feign the brand." (Zotter 2012b, S. 4, translated from German to English)

The problem was to find a suitable appeal for a pricy premium chocolate with provoking new flavours, which did not look just like the usual luxury products for attracting well-funded customers. How is it possible to create a new symbolic representation of a unique approach to chocolate? In a market dominated by big brands, which try to keep their market share by creating a corporate design and who have no interest in products which could not be sold in large volumes, there was no role model applicable to Zotter. Additionally the public appearance had to represent the high ethical values appropriate to the vision of Josef Zotter.

Communicate and represent the fit between ambition and action: the first step to create Zotter as a brand was the collaboration with an artist (Khaire et al. 2011). Until now all products of Zotter are designed in a unique way and transport a complex message by pictures on the wrapping. A new project to donate one school lunch to a refugee for every chocolate bar of a special edition sold, is represented simply by stylized school children with a plate in their hands. Every chocolate creation has its own image and challenges the customers together with the new flavours. Until now the complex task to create a unique public appearance for the products is conducted just by Josef Zotter and the artist Andreas Gratze.

These new flavours are developed without any market research: "How should the customer know what is even possible?" For every season new combinations are designed, which sum up to 340 different recipes clustered in 13 groups. While some bars, like the fish-chocolate, do not find any customers, others become bestsellers. But even established combinations have to give way to new ideas to be able to constantly offer new ideas to the customers.

Also the wording became an important channel for communicating the difference between the handmade techniques of the handscooped chocolate and that in the industrial production of chocolate. "The German term *handgeschöpft* [*handscooped in English*] was derived from paper production and traditionally defined the process through which different layers of paper were compressed in order to produce higher quality sheets" (Khaire et al. 2011). Although the customers did not know the term relating to chocolate, it transported the idea of the craftsmanship behind the chocolate of Zotter. When competitors started to use the term handscooped for their own products,

Zotter decided to register handscooped chocolate as a trademark to protect the wording for their production techniques. The wording becomes a valuable asset, functioning as an established symbol instead of the complex description of the differences in the production of chocolate

Another important pillar of the communication with the customers is the show-plant where the chocolate is produced and visitors can attend a guided tour with explanations around the product. Embedded in an attractive programme with a chocolate theater and a farm, 200,000 visitors a year come to the peripheral location of Zotter. “We hope to make these 200,000 visitors insiders to Zotter chocolate and we hope that they will tell their friends and their families about Zotter when they get home”. Ultimately customers of the web-shop are able to do this tour virtually by downloading an app for their smartphones.

The most profound innovation was a big insourcing project to be able to produce chocolate from bean to bar. As this included new production technologies, new organisational structures and new suppliers, it could be argued that this was an organisational innovation. Economically it did not make any sense to buy expensive machinery which could not be used to its full capacity and to compete against the industrial cost structure of the intermediate goods in the chocolate production. However, for the design of new flavours and the fit between the ambitious vision and the production it becomes a unique selling point. Having the whole production process from bean to bar in-house, innovation can start with the intermediate products. Otherwise time-consuming negotiations with suppliers and how their intermediate products should be adapted to Zotter’s ideas would be necessary. Furthermore, Zotter is able to guarantee a high-quality production process for all production stages and can ensure its Fairtrade policy by buying cacao beans directly from the plantations and link this with social projects. This fits in with the actions of the enterprise and its vision of providing innovative high quality chocolate fills the brand Zotter with life.

The fit of brand, enterprise and production: Zotter’s chocolate innovations created conflicts between the marketing of these new products and food legislation. The packaging size for chocolate bars was standardised to 50 grams or 100 grams, while Zotter sold 70 gram bars, because the size had a good appeal. Additionally, selling 70 grams opposed to 100 grams give the advantage of a lower price (Khaire et al. 2011). Further product innovations using new ingredients to create chocolate diverged from the legal definition of obligatory ingredients for products named “chocolate”. Still, Zotter decided to sell these creations as chocolate.

Being ahead of the trend to buy cacao beans through fairtrade and to produce chocolate with organic ingredients, Zotter profits from the growing awareness for these topics. Although more and more products advertise as being organic, Zotter sees no threat from imitators for their positioning in the market: “We cannot be compared and do not want to compare ourselves with conventional chocolate.” Still, the imitation of the product names was stopped by registering a trademark.

A key feature of the marketing strategy was the organisational innovation to insource the whole production from bean to bar. While economically inefficient, this change does guarantee not only fast product innovations but also production principles which foster the image of exquisite chocolate.

M3 - Cutting-edge audio equipment for new, sophisticated customers, Germany

In this case the lack of knowledge about a customer group new to the firm led to marketing in the social media. Besides the possibility to inform the consumers, new marketing methods were a prerequisite for knowledge accumulation. The enterprise is one of the world's best-known manufacturers for professional audio speakers that are used primarily in recording studios. The core technology and competitive advantage are special tweeters and midranges that use in-house handcrafted membranes (instead of usual dome tweeters). This technology allows for an as neutral and distortion free sound as physically possible which, in turn, is the company's unique asset. In recent years the company has grown tremendously, due also to its newly devised strategy to attract customers in the home audio segment.

Professional marketing structures to serve new markets via the social media: some ten years ago no sophisticated marketing strategy was needed to attend to the needs of the established customers from the professional audio sector. There was no clear marketing strategy, since the customers were convinced by the superior technology and the company's reputation in the respective market segments. This situation changed when the company entered the market for end consumers.

Because of the owner's decision to carry out rapid product development and diversify established product lines, the need for some sort of professional marketing in terms of corporate identity, technological documentation but also customer service grew immensely. While skilled marketing for the initial core business (professional audio) was largely inexistent, the constantly growing number of speaker systems and new customer groups entailed at least the need for a consistent public image. Additionally, given the growing importance of web technologies, new communication channels needed to be developed to attract new customers, to keep them informed and to react quickly to their demands. This required a more sophisticated marketing and customer relation management.

Creating the position of a new staff position for marketing relations: even before the most recent growth in products and sales the company decided to create a staff position for marketing relations. To do things right from the beginning, special attention was given to the linguistic skills of the new responsible employee, who was subsequently trained to understand the underlying technological know-how. This was fundamental to serve a well-informed and self-organised group of customers, as the new marketing concept had to keep up with the extensive knowledge and criticism of the newly-won end consumers.

The tasks to be done were defined by the new specialist for marketing and included the development and implementation of a corporate identity, a more informative and convincing website and the use of social media (Twitter, Facebook, participation in relevant online forums). Especially the use of social media constitutes a marketing innovation for the company as this is completely new to the firm. The goal of this marketing innovation was not only to ensure a positive public image but to open up a more direct and interactive channel between interested customers and the company.

From over the fence to the eyes of the public: To satisfy the professional customers the focus was to deliver products, which almost advertised themselves due to their cutting-edge technology. Efforts for design, public appeal and a differentiated product portfolio were not part of the strategy. This led to a neglect of a basic corporate design and thus no basis existed for professional marketing for serving private customers. The lock-in to the strategy to serve professional clients mainly by new technology led to an increase in the costs of starting professional marketing structures and strategies. To compensate for the resulting lack in knowledge, a marketing concept new to the firm was implemented. The economic impact of this strategic shift is uncertain as the impacts of such innovation are not measureable. Unlike in the classical print media, where the success of an advertising campaign might be visible in an increase in sales, it is much harder to measure the impact of qualified feedback and careful moderation of online forum discussions or the number of tweets. This might lead to firminternal battles for resources, thus hindering the implementation of innovative marketing strategies.

Additional risks arise from the openness of the new communication channels. This marketing was based on the positive reviews of key consumers active in the social media. If the opinion of these customers deteriorates there is no direct control over the established communication channels or in other words: failures in service or the development of new products may lead to strong reaction of the community, greatly damaging the established image of the firm. This risk puts the pressure on the marketing strategy to strike the right tone for the customer base and serve customer demands or critics fast.

M4 - Manufacturer of weighing systems, Italy

This case involves an Italian SME company that, for over 20 years, has been designing, developing and producing weighing systems with high technology and accuracy, completed by a wide range of accessories. The most important business lines are agribusiness, where the company is the second global player in several product lines, and medical systems, where the company produces critical components for the most important global players producing complex medical equipment. Other relevant markets are industrial weighing products and customer-critical applications, such as weighing systems for Formula One cars. The company operates in an important Italian industrial district whose culture and networks constitute a strong push towards technology innovation and advanced manufacturing. Over the years, the firm has invested significant resources in designing highly innovative products, has advanced customer services, and has developed superior manufacturing capabilities and internationalized the business. Besides being very advanced from the technological point of view, the top management succeeded in creating a comfortable organizational environment where all employees are motivated and can find growth opportunities if they are committed to results. A sustainable environmental strategy was also defined and constantly followed. In summary, this SME looks like a very “advanced small multinational company with an American culture”. This is proven by the recent proposal of acquisition received by its major American competitor (after which the owner of the company raised the offer to buy the American competitor himself).

Excellent technology, lack of marketing: the strong leaning to technology and research was the reason for the successful growth of the company in past years. To achieve these results, the company developed a solid manufacturing culture based on innovation and skilled and motivated employees coming mainly from the technical, engineering and sales fields. On the other hand, strategy and marketing were not given the same importance in company culture and operations. The company did not even have a marketing department: the few operational marketing tasks that the company was managing (such as basic communication and participation to fairs) were under the responsibility of the sales department.

When the company achieved a critical mass that was requiring a more structured organizational and market approach, the top manager felt that this lack was penalizing business results and that stable efficient marketing processes could significantly boost turnover and profits. Prior to this, several technology-pushed innovation projects were launched without a clear market idea, with the result that the product portfolio was full of products generating very limited sales and whose target market was nearly unknown. The company was consequently feeling the need of rationalizing its product portfolio based on structured market potential considerations. This was supported also by the evidence that major competitors were realizing similar turnovers with qualitatively lower products, but with stronger marketing activity. When the economic crisis started to generate negative effects, the multitude of products and the lack of fast market re-orientation capabilities did not allow a focus of the limited resources on the most profitable businesses.

Introducing a new marketing culture and organization guided by external consultants: in order to develop a solution for this problem, the top management decided to launch a strategic project to develop a new marketing culture and to implement structured marketing processes inside the company, supporting it with maximum commitment. Since internal marketing competences were not available, the company decided to ask for the professional support of the Marketing Section of one of the most renowned Management Engineering Universities of Italy. The initial request addressed to the consultants was to support the rationalization of the product portfolio. The project lasted about one year, it was led by two marketing professors with consulting backgrounds and saw the involvement of a wide group of company employees in different seminars and workshops. The consultants studied the product portfolio and proposed a method to take rationalization decisions: based on the current market segmentation, targeting methods were applied in order to prioritize different product lines and to identify the candidates for elimination. Suddenly it became evident that the available market information was not sufficient to perform the task, since structured data on competitors, segments, success factors, etc., had not been taken into account for prior consideration. For a further knowledge transfer, the consultants developed customized operative tools (such as market interview guidelines, targeting and reporting tools, etc.), trained personnel through internal seminars and coordinating activities. A first suggestion on portfolio optimization was formulated, based on initial information by the consultants and was accompanied by the suggestion to continue the tasks conducted during the project on a normal basis, with the intent of constantly refining and verifying preliminary conclusions. The investment needed for a further support by the consultants to cope with additional work needed to cover the lack of data and information, etc., was not affordable by the company, these tasks had to be managed internally.

After this first project, the company requested professional assistance from the same consultants for a new marketing project when the financial crisis started to seriously affect market results. The goal of the project was to define new sectors to target an extraordinary marketing campaign and aimed at increasing sales. The project consisted of the definition of a structured method for fast generation and evaluation of new segments and in its application involved repeated workshops and brainstorming with key personnel. The project lasted about six months and results were used to promote new sales activities.

Finally, the company launched a third project with the scope of introducing e-business for the industrial products line, together with stable processes and organisation to manage e-business marketing. The consultants supported the definition of the e-commerce strategy and platform specifications, the selection of a software house and supervised the technical development. They also designed the business processes and supporting tools (information systems, mix of communication instruments, reporting tools, communication guidelines, etc.) to manage marketing communication in a stable and professional way. By coordinating and supervising the activities for one year after the e-commerce implementation, they could continue transmitting a new marketing culture and supported the implementation of the new tasks in the company. Due to lack of industry acceptance of the internet distribution channel, the success of e-commerce for the industrial products line was disappointing. Still, the company was so satisfied about the processes implemented and about the new contacts with potential customers generated that the management decided to extend the newly-designed marketing processes to the other main business lines (agribusiness and medical).

During all these projects over a period of about five years, the top management implemented constant organizational changes. For the new marketing processes a new department was founded and employees coming from the sales department were appointed to create and manage the new marketing department. To enhance the capabilities of the marketing department new employees were also hired.

Need for significant resources and external knowledge: this case reports the situation of a company that clearly identified the need for an innovation project in the managerial area of marketing that was not part of its technologically-focused “DNA”, but became necessary when a critical size was reached that required a more structured marketing approach. Even if the owner has a strong technical background and had no specific competencies in marketing, he was strongly committed towards this change and decided to dedicate significant resources to it by re-investing capital that had been accumulated during the previous years of market success. However, even though the management showed remarkable openness for the new field of marketing and a remarkable willingness to spend resources on the project for an SME, the following factors represented serious difficulties in this evolutionary process.

Available financial resources were not enough to support the optimal change in the management process proposed by the external consultants. Year by year the company had to select the improvement projects that the consultants were proposing according to the available budget. As a result, projects were started more because temporary marketing urgencies had to be faced rather than because an organic marketing and organizational innovation plan had to be followed.

Consequently, positive results were delayed compared to what would have been possible with higher investment power.

The financial limitations could not be reduced by public funding, because European and national funds for innovation were judged not be useful for the company, since the application mechanisms were considered complex, the time horizon to gain the permission not coherent with market dynamics and research topics close to the company business and to the innovation needs had not yet been identified.

The process of introducing a marketing culture, a stable marketing organization and marketing tasks was slow and had to overcome the natural resistance posed by employees and managers working in the company. It has been very hard for the consultants to convince managers to postpone sales and product development decisions after having performed deep and time-consuming marketing analyses. The business success, had, in fact, always been based on a fast decision-making process and on technological intuition. As a consequence the consultants were not always involved in the decision-making and the managers delayed the adoption of the suggested guidelines. In this sense, some flops were “very useful” convincing the employees about the importance of a serious strategic marketing action before deciding on new products and R&D projects.

The firm had problems in hiring skilled marketing experts who could effectively continue the actions set up by the external consultants on a daily basis. Due to the lack of internal marketing experts the young applicants doubted whether they would get professional guidance for their career development. Although the salary offered was interesting, the location of the company site, distant from big Italian metropolitan areas, discouraged applicants. Additionally the strong manufacturing orientation of the company proved unattractive for professionals applying for a marketing job, since they preferred consulting careers or jobs in large multinational companies. Therefore the company experienced more than one case of newly hired employees who left within their first year.

ME - Expert for Marketing – Prof. Dr. Tomas Falk, Germany

The expert for Marketing, Tomas Falk, holds the Concardis Chair for Consumer Behaviour at the EBS Universität für Wirtschaft und Recht in Oestrich-Winkel, Germany. The current focus of his research is consumer behaviour, service marketing and strategic marketing. Due to the very broad field of marketing the interview focused on these fields of expertise and overall estimations on broader meta-trends within the field of marketing.

As discussed in the theoretical framework, the research on marketing innovation in this study relies on the definitions given by the 3rd edition of the OSLO Manual (see chapter 2.3.2). However, while the concept of marketing innovation represented in the OSLO Manual separates the fields of product innovation and marketing innovation for academic reasons, marketing literature is more likely to link both fields, for example, within the concept of product management. As a result, marketing covers a broad range of different market-related activities within enterprises. From this perspective, marketing innovation research based on the OSLO Manual is only able to deal with

some of the relevant and multifaceted marketing activities of firms. To address this problem, future research on marketing innovation should access delimited fields of marketing innovation in more detail, so that case studies could show a significant share of the theoretically expected variance within the field.

A common trend for marketing innovation is the usage of social media, as shown by our case study M3. But following the opinion of the marketing expert, this development only reflects one aspect of the general shift within the dominant paradigm of marketing, the perspective of customer value. Changes in marketing focus on the value created by the usage of products and/or services for the customers. This leads to new services and other concepts enabling the customer to act as a co-creator of value. These new marketing concepts are based on the possibilities of the new media in many cases. Mass customization of consumer products allows a variety of product designs to be offered, open innovation includes customers in the process of product innovation and the space offered by firms in the social media is partly filled with user-generated content. What these developments have in common is that the customer is actively involved in the creation of value. This ranges from more indirect benefits, when customers discuss the product and its malfunctions in Internet forums and thereby help the future product development, to direct benefits, when experienced users get an expert status working as unpaid trouble-shooters, thus saving costs in services for the firm. The knowledge and the active participation of the customers beyond simply buying products becomes a valuable asset.

Still, there are branches with a lower propensity to engage in social media marketing. In general, consumer good markets are under higher pressure to use innovative marketing concepts, like presenting their products in the internet or offering a configurator for individualized products. If the product and/or service can be standardised easily and is more or less self-explaining, the usage of customer co-creation is feasible. In the case of highly individualized products in the business to business context direct communication is important, like for complex capital goods.

The growing importance of a more direct contact between customer and enterprise based on social media channels does not, however, lead to a loss of importance of classical advertising activities. On the contrary, powerful international networks supplement the penetration of new markets abroad while helping enterprises to cope with the ongoing globalisation of their markets. Still, more research is necessary to understand how enterprises implement new, innovative solutions for their communication and the creation of new brands, especially in business to business markets.

Regarding possible barriers for marketing innovation in firms, two groups of firms can be identified: start-up companies and medium-sized enterprises. In the case of start-up companies the (radical) product innovation is central for all efforts resulting in low attention for market research as a necessary input for a successful product launch. Even with few resources it would be possible to assess aspects like e.g., consumers' acceptance of new products and their willingness to pay. Startups could benefit from networks focusing on marketing by getting a first impulse for a future marketing strategy based on market research at early stages in the product development. This could help the firms to develop a marketing concept tailor-made for the product innovation to create a persistent competitive advantage.

For medium-sized companies the lock-in to existing resources may limit the absorptive capacities for new methods in marketing. Medium-sized companies based on a more technological “DNA”, similar to our case M4, develop their business processes around a stock of knowledge dominated by engineering. Even though there are activities regarding the public appearance of the products or the company, there is no underlying concept on a strategic level. Still, the activities of medium-sized and even small-sized enterprises regarding marketing innovations need further research.

At least the result of the activities leading to a marketing innovation is fully visible to competitors: new designs, online configurators, even the appeal of the website can be imitated. Still, the problem of externalities for investments in new marketing concepts is limited. The first reason is the importance of the actual product: only in the short run can sales be based on a pure marketing strategy, the product needs to provide customer value and stand for the company image and values, as presented in our case M2. The second reason for a limited impact of externalities on marketing innovation is the importance of brands. To establish a strong brand for the communication with the customers, great efforts in time and resources are needed. Thereby parts of the marketing strategy can be imitated, but still do not touch the appearance of the brand as a whole. This creates a protection for the investments of the first mover, because competitors need time and resources to build up their own stock of consumer trust represented by a brand. On the flipside this power of established brands might hinder the successful market entry of new competitors.

The symbolic communication via brands shows significant inertia, it is hard to change the public appearance fundamentally in a short period of time. The image of an enterprise cannot be changed easily, so that innovative marketing is bound to decisions on the marketing strategy made earlier. This holds true especially for problems with the products or dishonesty in the behaviour of the firm. As a result opening up the communication channels for the customers via social media, this could mean opening Pandora’s box, because disappointed customers might destroy trust capital in a short period of time, which had been created over the years building up a public brand. This storm of criticism is feared as “customer’s revenge”. The proactive management of disappointed customers becomes vital to preserve investments made for marketing and marketing innovations.

5.4 Findings across the cases

As pointed out in the first chapter, the firms’ case studies were conducted with the aim of shedding light on the two major questions of this study: the level of the direct and indirect economic impact of organisational and marketing innovation and, even more important, to explore external barriers to marketing and organisational innovation. It turned out during the case studies that the perspective implied by these questions needs to be supplemented regarding the implications of the empirical results for the theoretical concepts and the methodological approach. Therefore these more general remarks will be discussed subsequently to set the stage for the assessment of the economic impact and the relevant barriers afterwards.

One of the major concerns regarding this study as a whole was the lack of research regarding the specific question of external barriers for marketing and organizational innovation. Because of this, **the operationalisation of the abstract concepts** of organisational innovation and marketing innovation as well as market and systemic failure was crucial to our research project. Following a problem-centred approach (Edquist 2011) these concepts were turned into questions regarding concrete projects to solve certain operational issues using new methods for the organisation or the marketing of the firm. Turning the question from an abstractly categorized group of solutions (e.g. marketing innovation or organisational innovation) into the problem-oriented perspective of the management worked very well for the interviews. This has to be explained partly by the embeddedness of the innovations themselves.

The problems solved by the implementation of new non-technological methods evolve from the context of the firm. This trivial fact leads to **solutions** within the firms that are deeply interlinked with all the resources available and **not limited to academically constructed concepts** like marketing innovation and organisational innovation. Although highly important for academic discourses about innovation, these concepts do not play any role for the enterprises whatsoever. As a result the solutions developed by the firms could not be categorized easily and needed to be understood out of this constellation. Therefore the majority of the cases showed strong complementarities between technical and non-technical innovations. For example, the organisational innovations implemented in case O2 were the necessary complement for a market-oriented expansion. In the case of Zotter chocolate (M2) the strong linkages between new chocolate recipes, integrated production processes, appeal of the product and the vision of chocolate created the competitive advantage. Our case studies indicate strongly that an empirical approach strictly based on the concepts of marketing innovation and organisational innovation might not be able to reflect these types of innovation to a sufficient amount.

The problems in the case studies and the **solutions implemented** turned out to be **highly firm-specific**. Still, all cases showed the great importance of internal resources for the success of the changes. Two major internal barriers to the success of the marketing or organisational innovation were the absorptive capacities and linked to that the level of institutionalisation of activities in the field of marketing or organisation. As the expert on organisational innovation EO2, Jörg Bahlow, pointed out: while technological knowledge is more likely to be absorbed by specialists in the department for research and development or at least by employees with a formation in the field of engineering, it is less likely to find specialists with a formation linked to organisational innovation like a degree in organisational psychology for example. This was also visible in case M4, when the technological “DNA” of the firm was little compatible to new know-how in the field of marketing. Furthermore, our case studies suggest the assumption that for organisational innovation and marketing innovation great efforts are necessary for adapting blue-prints to implemented solutions.

The embeddedness of organisational and marketing innovation also becomes apparent regarding their **economic impact**. The theoretical concepts for the economic effects, as developed in chapter 2.3, are direct economic contributions of innovations in the field of marketing or organisation, enabling other types of innovation and improvements in the absorption and usage of knowledge. Linkages between the concepts were visible for some cases; still, the dominant type of

economic effects is discussed for the case studies. Regarding the economic impact, all cases showed positive economic effects of marketing and organisational innovation, which made a significant contribution to the long-term survival of the firms.

In the cases O1, O2 and O3 organisational innovation was mainly implemented for direct improvements of the organisational performance. The direct contributions, with organisational innovation as a **distinct form of innovation**, were to prevent the threat of a significant drop in the firm's performance in case O1 and an improved lead time to serve customer demands in a complicated market environment in case O2. Improved service to the customers is expected to increase the sales in case O3. In the case M1 the marketing innovation of a public branding for an existing product has a direct effect on the sales. In the cases O1 and O2 a direct measurement of the effects of the organisational innovation was not possible. It cannot be estimated easily how much the performance or market position would have suffered without the new solution. In the case of O3 a very fundamental change in the business processes due to the implementation of a new ERP Software allows for the usage of key performance indicators. In the case of M1 the growth in sales was caused solely by the new marketing concept.

A more indirect effect of organisational innovation was covered in the cases O4, O5 and O6, with organisational innovation as an **enabler for other types of innovation**, i.e. product innovation in the cases discussed here. Besides the mediated economic effects via the supplemented product innovations, in the cases O4 and O6 new methods to organise innovation were used to reduce the effects of external factors hampering product innovation. Compensating for Interaction/network failures (see chapter 3.2), blockades in the process of product innovation have been resolved. Regarding the positive complementarities between technological and organisational innovation that have been revealed by quantitative analyses, this effect of organisational innovation resolved by the case studies could be one possible underlying explanation for the higher positive impact of such combinations on firm performance (see chapter 4.2).

For marketing innovation, another type of indirect effect was investigated with case study M2, marketing innovation as an **amplifier for other types** of innovation. The case of Zotter chocolate showed strong linkages between different fields of innovation, creating a substantial competitive advantage. Due to these linkages an estimation of the economic effects of the marketing innovation alone is hardly possible.

In the cases O7, OE1 and M3, the innovation was not tied to direct economic goals, but was aimed at improving the usage of the intangible assets within the firm. In these cases, organisational and marketing innovation has the function of a **prerequisite** for knowledge accumulation. Although the positive effects were hard to quantify, the efforts were perceived as a precondition for economic success in the long run.

The **external factors** which might **hamper the deployment of organisational and marketing innovation** were derived from the most common theoretical concepts to investigate external hampering factors, the concepts of market failures (chapter 3.1) and systemic failures (chapter 3.2). These theoretical concepts were used as heuristics to find which types of external barriers might have hampered the implementation of new solutions in the fields of marketing and organisation. As a result we collected qualitative data which allows external barriers to be clearly

identified during the implementation. These results must be seen within the limitations of qualitative data in general, for although external barriers were found for some cases, it is not possible to draw any generalisations from these findings. More research is needed using our results as one starting point.

The hampering factors differed strongly in their impact on the single cases; therefore not all failures were discussed in the single case examination and are presented here. The description of the failures is supplemented by examples referring to the case studies. Still, not all the qualitative data can be presented in order to keep this section focused on the barriers found. Due to the complementarities between both concepts there will be intersections between the categories, which will not be explicitly discussed since they are of a more theoretical interest.

With regard to the narrower concept of **market failures** of the neoclassical theory, the following findings can be summarised from the firms' case interviews:

Externalities occur when agents do not enjoy all of the benefits of their actions. They might hamper organisational innovation and marketing innovation, when imitators can benefit from the investments made by the innovator to develop a new solution for the field of marketing or organisation. The risk of investing in a new organisational set-up was mentioned in two cases (O1, OE2), when direct competitors were able to copy a new solution at low costs. The costs for the adaptation and implementation of the abstract blue-print of an organisational innovation dominate the costs of imitators in many cases. In the two examples mentioned, the solutions were sufficiently specific that competitors would have been able to have a considerable free rider advantage. Contrary to our expectations such problems were not visible in the case studies regarding marketing. In cases M1 and M2 strong brands, which cannot be imitated easily, protected the competitive advantage. In the cases M3 and M4 the internal costs for professional marketing structures reduced the free rider advantage of an imitator significantly.

Moreover, externalities were of minor importance for other case examples. The majority of the implemented organisational innovations have the character of **public goods**, because there are no intellectual property rights applicable to organisational innovation and extensive knowledge about new organisational methods was publicly available. The costs of the organisational innovations in the case studies were predominantly due to the necessary adaptation of public concepts to the firm-specific structures. This holds true for the case studies regarding marketing innovation M3 and M4, where blue-prints for professional marketing structures are publicly available too. In the cases M1 and M2 the brands were backed with trademarks and registered designs.

As for any other type of innovation, **uncertainty** is a major issue also for organisational and marketing innovation. There are only few established methods for a cost-benefit analysis of the organisational innovation ex post. Just in two cases of organisational innovation (O2, O3) performance indicators were used to measure the effects of the newly implemented solutions. For marketing innovation sales are an established measurement. Hence it was not possible in all cases to link marketing activities directly to sales. Business processes with a higher share of quantifiable parts might allow the evaluation of new organisational methods using direct performance indicators as lead-time, etc. But in most of the cases, the cost and benefits of organisational innovation could hardly be assessed, both ex ante and ex post to the decision-

making process. Thus, in contrast to technological innovation, whose investment costs and productivity impacts can at least roughly be taken into account, the uncertainty might even be greater for organisational innovation. Moreover, like failures in large and risky R&D projects might threaten the survival of SMEs, failures in organisational innovation might damage the functioning of basic working processes, destroy the existing organisational culture or negatively affect the motivation and performance of employees because they are implemented at the “beating heart” of the firm. Failures in marketing innovation might damage the firm to a tremendous amount too. The current structure of a brand needs to be assessed carefully to stay within the established symbolic limits. Especially marketing promising customer value for poor products might be confronted within a very short time with customer’s revenge. **Ex ante** estimations of the benefits of a given marketing or organisational innovation are complicated, as in many fields of innovation. In only one case (O3) were concrete estimates for expected performance improvements reported. Although obligatory in many project plans, the estimations of expected benefits in the field of advanced lean production were considered to justify the project budget more than calculating the revenues (OE2). The estimations about potential growth in sales made by advertising agencies in case M1 were also strongly doubted. Still, growing absorptive capacities led to significant improvements in the ability to evaluate marketing measures *ex ante* (M1, M4).

Economics of scale influenced the costs of organisational innovation for larger companies (OE2). Larger companies often have dedicated staff positions for the implementation of new organisational methods available. Using internal knowledge for recurring organisational problems lowers the costs for the implementation of new solutions. The higher market power of large firms might serve as a catalyst for some organisational concepts like just-in-time with suppliers (OE2). While suppliers might refuse to deliver just in time to smaller, unimportant customers, offering that service to big players becomes a crucial part of their competitiveness. Additionally, networking initiatives from bigger enterprises (O5) have a much higher impact due to their size, while smaller companies cannot change their external relations, because they are not able to convince their partners to participate. In total, economics of scale and market power played a minor role for firm cases (O1-O7). Economics of scale were important for case M1 to build up a public brand in a short period of time, engaging directly in the struggle for the attention of solvent customers with other firms. It was possible to invest significant resources in the project of public branding to overcome a blockade in the existing distribution networks, which would have not been feasible for smaller enterprises or enterprises in a bad financial shape. Still, as the expert on marketing innovation ME, Thomas Falk, pointed out: brands are based on products and it is not likely that good products can be prevented from market entry in the long run.

All cases were affected by **capital market failure**, because no external financing was available for the organisational change or the implementation of new marketing methods. Like other kinds of innovation the changes were financed by the firm’s own resources or, as in some cases, supplemented by resources provided by public programmes (e.g. O4). In contrast to investments in technological innovation, the lack of material collateral can also act as a financing barrier. While new machinery can be used as collateral for an at least partly external funding of process innovation, this option has no significance for organisational innovation (O2).

As pointed out in section 3.2 **systemic failures** need to be considered as a supplement to market failures, to cover external hampering factors in the field of organisational and marketing innovation sufficiently. Barriers already discussed as market failures will not be included again, although they might fit into similar dimensions of systemic failures too. Revisiting the firm examples, the following aspects of systemic failures can be summarised:

Infrastructural failures were so far not hampering any of the cases analysed.

Institutional failures due to conflicts between social norms and organisational innovation or marketing innovation need to be analysed deliberately, because social rules and legal regulations can obviously not be considered as a mere hampering factor for innovation. Changes in the working conditions of the employees, for example, are an important aspect of new organisational methods. In the field of marketing, limits to the promises made by advertisement is a necessary precondition for functioning markets. Still, there have been some examples where existing legal regulations conflicted with the innovation. The organisational changes in case OE1 could not be turned into binding legal contracts, lacking a legal basis resulting in a legal limbo. In case O4 it was not feasible to negotiate work at the weekend when the new computer system was started. Concepts of lean production could not be copied from Japan to European production processes due to different health and safety regulations (OE2). The naming of a product as “chocolate” obliges the firm to use certain ingredients, which were left out of some of the new chocolate recipes, which were still sold as chocolate (M2). The lack of entrepreneurial spirit (O6) among the members of an innovation cluster could be considered a soft institutional failure.

A more fruitful perspective opens up if the lack of intellectual property rights for organisational innovation is considered not only as an externality or a public good, but as institutional failure. The patent system protects not only the innovator from imitators, but also serves as an institutionalised vehicle for knowledge diffusion and accumulation in the case of technological innovation. The lack of such an institutional mechanism for organisational innovation was considered to be a barrier (O1, O2) for the identification and neutral information about adequate organisational solutions, independent of the individual marketing interests of external consultancies.

With regard to **interaction and network failures**, the firms' cases revealed the problem of dominant network structures along the value chain as well as a predominance of product-centred input. This is all the more remarkable as the firms that are usually willing to participate in such research projects present a positive bias towards innovative firms and best-performers which are already embedded in corresponding networks to an above average level. Nevertheless, three cases (O2, O4, O7) show that existing interactions within the industry and value chain were not sufficient to provide input for organisational innovation. Dominant players in the networks might even force subsidiaries or suppliers to implement new organisational structures even though they might not fit the company (OE2). In one case (O4), there was even the risk of structural inertia due to too close interaction with dominant customers. As emphasised by some interviewees (O1, O2), weak ties to partners or firms located in other networks and industries would be preferable to avoid these problems. This perspective holds true for the marketing innovation in case M1: weak ties to firms offering products for similar groups of customers were of high value.

The perspective of **interaction and network failures** becomes very **fruitful if the perspective is turned around**: firms might be unable to make the optimal use of their resource base, because they are not able to find and include complementary external resources from existing networks. Two of the organisational innovations were aiming directly (O6) or at least partly (O1) at establishing new relationships with other companies and research institutions. In the case of high-class office chairs (M1) the marketing innovation was bypassing a blockade in existing distribution channels, rendering the success of an existing product possible. This bypass resolved an existing network failure for the product innovation made earlier.

Finally, looking at the dimension of **capability failures** or the lack of internal knowledge, capabilities to absorb knowledge are of central importance to companies and their innovation activities. In contrast to R&D-based innovation, the majority of the firms do not have human resources specifically devoted and responsible for organisational innovation. Employees with qualifications especially for organisational change are an exception (OE2). Almost all firms report the problem that they lack internal capabilities to successfully implement an organisational concept under their own steam. Moreover, due to a lack of integration on strategic planning, the decision to engage in new methods for the organisation was rather reactive than proactive. While the problem was quite clear, the organisational solution is not known to a sufficient extent before the projects are started. In two examples it took more than two years to define the requirements of the future organisational structures to a sufficient degree (O2, O3). Still, one firm (O1) decided to use its newly developed capacities in organisational innovation to turn them proactively into a competitive advantage. In the cases of marketing innovation, three firms (M1, M3, M4) engaged for the first time in the professionalization of their marketing structures, coming from a very small knowledge-base in these fields before the change was conducted.

The small knowledge-base in the field of marketing or organisational innovation creates a blind spot. The firms show little awareness and are less likely to engage proactively in a new field like marketing or organisational innovation. But if they start to engage in these fields with a low level of institutionalisation, such as in the form of a dedicated department, the resources spent on changes in marketing or the organisational structure are hard to defend against the necessities of the daily business.

Asking the firms in our case studies for the **usage of policy support** for their projects, the answers varied. In some examples public support was used (e.g. O4), but the majority reported that the process of approval would have been too time-consuming and in some cases there were no programmes available, in which the given organisational or marketing innovation was fundable. For the field of organisational innovation some programmes were considered to be written in a scientific language which is hard to understand for firms (OE2).

6 Policy assessment

The growing interest in new and non-technological forms of innovation raises the question of the roles of policy in these areas. Are the same measures applicable to new forms of innovation, or is there a need to develop new measures and instruments? Are the rationales for public support to R&D and technological forms of innovation valid also for innovations within organisation and marketing activities? These are some of the crucial questions which arise when studying the policy dimension of marketing and organisational innovation.

6.1 *The emergence of innovation in policy*

Although policies have addressed and promoted innovation for decades, innovation as a distinct policy domain is a rather new phenomenon. The European Commission Green Book on Innovation from 1995 is often referred to as the first example of an explicit action-oriented innovation policy document. This document coined the term of the “European paradox”, namely that one of Europe’s major weaknesses lies in not being able to transform its strengths within science and technology into corresponding economic results and competitive advantages (European Commission 1995). To our knowledge, most national innovation strategies, labelled as such, are issued after the year 2000. The innovation literature also suggests that innovation as a political field has evolved from a sub item under science, technology and industry policy to a policy area of its own.

Lundvall and Borrás (2005) suggest a development from science to technology and to innovation policy, although underlining that these perspectives overlap and are not to be seen as strictly sequential historical phases. In many ways, the emergence of innovation policy as a distinct policy area coincides with a more systemic view on innovation. This view represents a shift from the so-called linear model, which suggested that innovations are the final result of a causal chain from basic research via applied research to technological development.

The linear approach was the prevailing innovation model during most parts of the 20th century. Hence, there is reason to claim that innovation policy, up until quite recently, has had a main focus on R&D, technological development and the improvement of general framework conditions.

6.2 *Towards broader innovation policies*

However, there is hardly any doubt that the concept of innovation, and hence the role of policy, has broadened over the last few years. Compared to the innovation concept in the first OSLO Manual and the first waves of the Community Innovation Survey, innovation today comprises a wider range of industries, a broader set of activities (beyond R&D and technology) and even new purposes in addition to that of economic growth (e.g. health, environment, social cohesion). The emergence and diffusion of the systems of innovation approach, starting from the early 1990s, has also been influential in broadening the scope of innovation policies.

But what are the concrete implications of a broad innovation policy? In a special chapter on the evaluation of the Finnish innovation system from 2009, Edquist et al. proposes two possible meanings of the term broad-based innovation policy (Edquist et al. 2009):

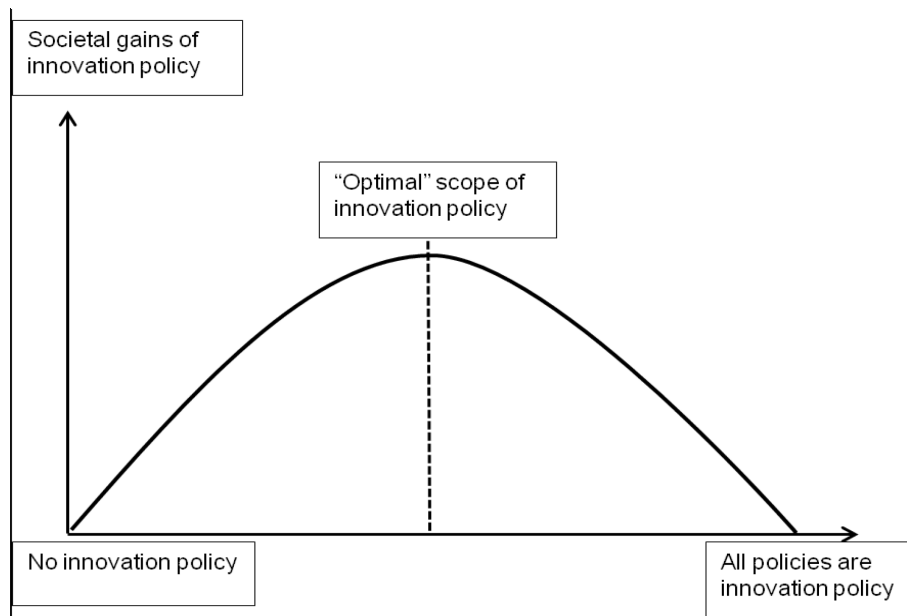
The first meaning relates to the broader concept of innovation. In short, when the definition of innovation is extended to embrace other activities than R&D and technological development, policies and the portfolio of instruments need to be supplemented with new measures and dimensions. In other words, the new nature of innovation calls for new policies and instruments.

The second meaning of broad-based innovation policy involves a more holistic and systemic approach. In this meaning, the broadening of innovation policies is about including all actors and activities that influence innovative activity. In other words, when more actors are considered to play a role in the innovation process, innovation policies should include and address a larger part of the system. To exemplify, one could imagine that education and training institutions, trade unions, social security and arts and culture institutions are relevant parts of the system according to the second meaning of the broad-based innovation policy.

On the other hand, there is a limit as to how far one should go in widening the scope of innovation policy. Including too many aspects in the innovation policy portfolio may undermine the strategic impact of innovation. There is also a risk of fragmenting and obscuring political responsibility, in the sense that “everybody’s responsibility becomes nobody’s responsibility”. Hence, there is a challenge to strike the right balance between narrow and broad innovation policy. This can be illustrated by a version of the so-called Laffer-curve⁶, which was used in the evaluation of the Finnish innovation system to illustrate that broadening the perspective of innovation policy can prove beneficial up to a certain inflexion point, from where the broadening may start to have more negative than positive effects

⁶ The Laffer-curve is named after the American economist Arthur Laffer, and originally used to illustrate that increased taxes do not necessarily increase tax revenue.

Figure 5: Broad innovation policies according to the Laffer-curve



Source: Finnish Ministry of Employment and the Economy, 2009

Of course, this model should not be taken literally, as there is no such thing as an optimal balance between broad and narrow innovation policies. In fact, innovation systems can be understood both in a narrow and a broad sense. The broad sense would encompass all parts of the economy which influences innovative behaviour in one way or the other. The narrower sense would limit the scope to specific parts of the system, for instance the R&D and education system or specific regions, industries or sectors. (Edquist 1997, Fagerberg, Mowery and Verspagen 2009). In this sense, the scope of innovation policies is more context-specific than based on a general balancing between broad or narrow innovation policies.

So, how is the broader notion of innovation reflected in practical policy making? The recent innovation strategies from the EU and the OECD are in many ways concrete examples of broad-based innovation policies. For example the European Commission's Innovation Union states that:

“Europe must also develop its own distinctive approach to innovation which builds on its strengths and capitalises on its values by: Focusing on innovations that address the major societal challenges identified in Europe 2020 [...] Pursuing a broad concept of innovation, both research-driven innovation and innovation in business models, design, branding and services that add value for users [...] Involving all actors and all regions in the innovation cycle: not only major firms but also SMEs in all sectors, including the public sector, the social economy and citizens themselves ('social innovation'); not only a few high-tech areas, but all regions in Europe and every Member State, each focusing on its own strengths” (European Commission 2010).

Likewise, in its report to the OECD Ministerial Council Meeting in 2010, the OECD sees a need to

“[...] rethinking innovation policy in order to move beyond supply-side policies focused on R&D and specific technologies to a more systemic approach that takes account the many factors and actors that influence innovation performance, including demand-side policies. The policy objective should

not be innovation as such, but its application to make life better for individuals and society at large.” (OECD 2010a).

A general message from these and other agenda-setting policy documents is that a broader innovation concept calls for new policy thinking and a broader set of policies and measures. In this respect, both the EU and the OECD seem to embrace both meanings of the broad-based innovation policy described above.

In fact, this is not a new message. The need to broaden and rethink innovation policies has been stressed for a number of years (Smith 2000). Several studies have also observed signs of a broader and more experimental innovation policy on a practical level. Borràs describes this trend as a process of both the “widening” and “deepening” of innovation policies (Borràs 2009). In this sense, “widening” refers to extending the realms of innovation policy, in line with broadening described above. The trend towards “deepening” describes an increased sophistication and continuous improvement of policy instruments, i.a. as a result of evaluations and policy learning.

At the same time, there seems to be a general assumption that the visionary statements about the new nature of innovation are not yet fully translated into policy action. The strong emphasis on policy change from the EU and the OECD could be seen as indications that innovation policy practice is still “lagging behind” in a narrow, high-technology and science-push tradition.

This assumption is also supported by empirical evidence. Based on a review of TrendChart reports from 2008, Reid finds examples of discrepancies between the broad challenges identified in innovation policy documents and actual policy responses. For instance, he notes that measures targeting general training and skills development in enterprises seem under-represented, given the fact that most innovation strategies underline the importance of learning and creative working environments for innovation activity (Reid 2009). This observation suggests i.a. that there is a lack of policy instruments for organisational innovation.

In the following, we will focus specifically on two dimensions: first, we will concentrate on marketing and organisational innovation, and not address the broadening of the innovation concept in general. Secondly we pay special attention to the policy rationales behind the instruments targeting these forms of innovation, e.g. are they justified by a need to correct market failures, systemic failures, a combination of both or even other rationales and motivations?

6.3 Policies for marketing and organisational innovation

A natural starting point is to look at how the concept of innovation is defined in national innovation strategies. Although the OECD/Eurostat's Oslo Manual presents what might be called an official definition, many countries operate with their own headline definitions of the concept. The table below gives an overview of some recent definitions used in a number of countries.

Table 48: Headline definitions of innovation in selected countries

Country	Definition	Document	Marketing innovation	Organisational innovation
USA	« The design, invention development, and/or implementation of new or altered products, services, processes, systems, organizational structures, or business models for the purpose of creating new value for costumers and financial returns to the firm »	Report from “The Advisory Committee on Measuring Innovation in the 21st Century Economy” 2008	Indirectly	Yes
UK	“Innovation is the application of new knowledge to the production of goods and services; it means improved product quality and enhanced process effectiveness. Innovation generates wide improvements in productivity, which are the primary source of enhanced well-being, higher real incomes »	UK Government “Innovation and Research Strategy for Growth” 2011	Indirectly	Yes
NOR	“Innovation is a new product, a new service, a new production process, a new application or a new form of organisation which is launched in the market or implemented in the production process in order to create economic values »	Norway’s Government white paper on Innovation 2008	Indirectly	yes
Sweden	“Innovation is about new and better ways of creating values for society, companies and people. Innovations provide new solutions and answers to the needs and demands of society at large. Values arise through the use and application of new ideas, and these values can be both economic, social and environmental”	Swedish Government Innovation Strategy 2012	Indirectly	Yes
Spain	“[Innovation is] the action and effect of altering or changing something, by incorporating new aspects, or the process of creating or modifying a product and placing it on the market.” [...] “the ultimate goal of any innovation is to reach the market”	Real Academia Española (RoyalSpanish Academy), cited in Spain’s National Innovation Strategy 2009	Yes	Indirectly
Finland	“Innovation is (...) an exploited, competence-based competitive asset, which, in addition to the application of technology, can be founded on e.g. new service and business models, working and operating methods, or the management of product concepts and brands”	Finnish Innovation Strategy 2008	Yes	yes
Germany	“Innovation is achieved through new technologies, innovative services and	High-Tech strategy 2020 for Germany, 2010	Indirectly	Indirectly

	social change, but is also driven by the global challenges which demand new solutions and answers”			
Ireland	“Innovation is about doing new things, or doing old things in new ways. Innovation can apply to all aspects of human endeavour: in the arts, the sciences and business. No single area of government policy has a monopoly on innovation”	Strategy for Science, Technology and Innovation 2006 - 2013	Indirectly	Yes

These highly condensed definitions and opening remarks from strategy documents are not necessarily representative of the actual innovation profile in each country. Policies may embrace modes of innovation not covered by the headline definition and vice versa. Nevertheless, there is reason to assume that these definitions reflect the “mental models” underlying the innovation policy thinking in each country. In this sense, the definitions reflect at least two general tendencies; i) countries seem to consider innovation as a broad concept, covering more than R&D, technology and new products; ii) countries vary as to whether marketing and organisational innovation are explicitly mentioned in their main definitions of innovation. These observations “on the surface” of policy reports are to a large extent confirmed by findings in other recent analyses of innovation policy trends.

A specific review of non-technological innovation policies was carried out by the OECD in 2009 as input to the report “Beyond technology: New Forms of Innovation” (OECD 2011). Based on a survey in 14 countries, the report undertook a mapping of trends and practices regarding new forms of innovation (NFI). The exercise uncovered seven major trends in innovation policy, one of which being that “the understanding of the process of innovation is broadening in the policy discourse”. The report identifies a shift from technology-centred policies to a more knowledge-driven innovation policy. Furthermore, the analysis suggested that new forms of innovation require a broader and more complex mix of policy instruments. But according to OECD, scarce data and the lack of a common understanding of non-technological innovation policies make cross country comparisons difficult in this area.

Design policies are perhaps one of the most frequently mentioned examples of non-technological innovation policies. It is, however, difficult to grasp the exact nature and functioning of various design policy initiatives. Design policies are often mentioned under the rubric of marketing innovation, but in practice design is increasingly regarded as an integrated part of both product and service innovations. As clearly demonstrated in the first parts of this report, firms often combine the different forms of innovation. Therefore, design policies should not be limited to the area of non-technological innovation. In a recent study, Hobday et al. examine current innovation policy-making from a modern design perspective. They find that most design policies today tend to be shaped by yesterday’s models of innovation policy thinking, where design has been regarded as a separate activity outside the innovation process. Hobday claims that design “should no longer be seen as a styling or surface activity, but as a core technical task central to industrial products, processes and services throughout the economy” (Hobday et al 2012).

The importance of design for innovation was also raised in the European Commission Staff Working Document on “Design as a driver of user-centred innovation” (European Commission 2009).

The document concluded that design should be an integral part of European innovation policies, but recognised at the same time that most EU member states “pay little political attention to design”. Based on the working document, the Commission also launched an online consultation among various stakeholders on the role of design as a driver of user-centred innovation. The consultation resulted in 535 replies in total, whereof 309 came from organisations and 226 from private persons. More than 90 per cent of responding organisations considered that design was very important for the future competitiveness of the EU economy. And 96 per cent answered that initiatives in support of design should be an integral part of innovation policy in general. The respondents were also asked about the most serious barriers to the better use of design in European innovation policies. The most important barrier was reported to be the “lack of awareness and understanding of the potential of design among policy makers”. 78 per cent of responding organisations reported this to be the most important barrier.

Turning to organisational innovation, one relevant policy analysis is OECD’s report on Innovative Workplaces (OECD 2010c), one of many special reports issued under the umbrella of the OECD innovation strategy. The report reviews previous research on learning organisations and presents some of the main empirical results from the studies of learning organisations in EU countries and beyond. Moreover, the report includes a study of the relationship between learning organisations and innovative behaviour.

The results demonstrate clearly that creative and learning intensive forms of work organisation, labelled as “discretionary learning”, are over-represented in Scandinavian countries and the Netherlands. The results also suggest a clear relationship between learning organisations and innovation performance on a national level. The report is less explicit when it comes to policies for workplace creativity and learning. But all in all, the findings argue strongly for a need to shift the focus of innovation policies. Firstly, from a focus on the entrepreneur and R&D personnel to a broader focus on the collective behaviour of the total workforce. Secondly, from a focus on R&D and technology, policy focus tends towards softer perspectives such as innovation culture and so-called “flexicurity” models (combining social security and flexible, mobile workers).

It seems from the analysis mentioned above that non-technological aspects of innovation are increasingly present in policy thinking across countries and in a number of international policy documents. Reports from countries also show a variety of policies and measures already in place, some of which are directly or indirectly targeting marketing and/or organisational innovation. A general impression is, however, that these policies are treated as supplementary and ad hoc policy initiatives. There seem to be few indications of marketing and organisational innovation being explicitly integrated in the dominant innovation policy instruments, such as R&D support mechanisms. This assumption will be further investigated in the section below.

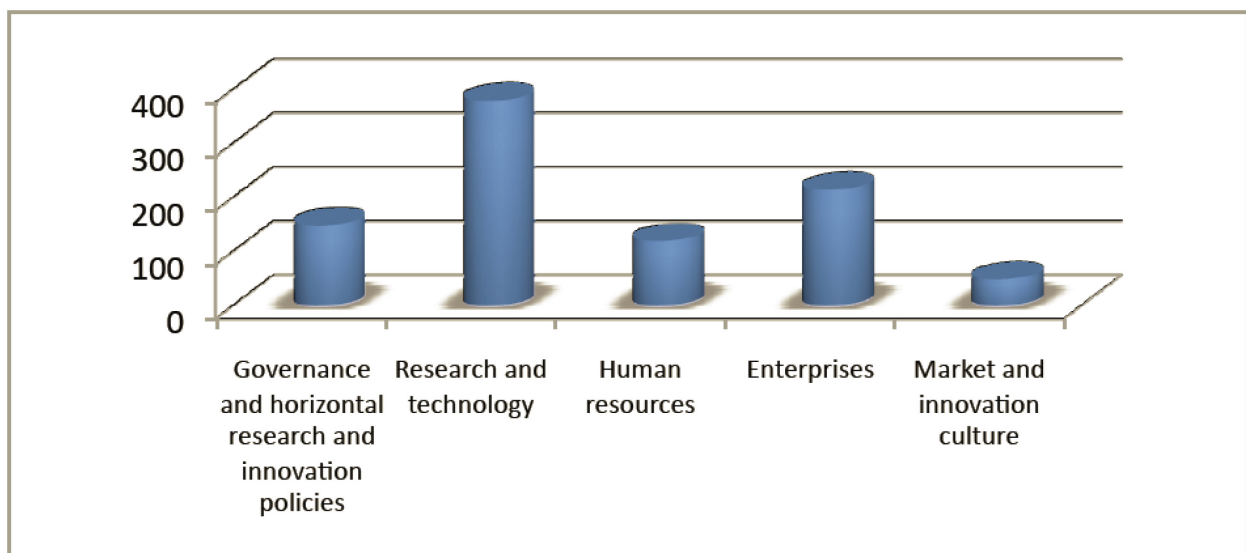
6.4 Policy mix for marketing and organisational innovation

A central question is to what extent existing innovation policy instruments and priorities are promoting marketing and organisational innovation. The increasing breadth and complexity in the innovation policy mix in each country makes it difficult to identify general patterns across countries,

especially when it comes to policies addressing new perspectives such as non-technological innovation.

A quite recent synthesis report on innovation policy trends draws together country-specific information from the ERAWATCH and TrendChart databases (INNO Policy TrendChart 2011). The report summarizes country reports and responses from 48 countries, and covers the period 2009-2011. When it comes to concrete policy measures, the review concludes that the mix of policy instruments is surprisingly traditional. Various forms of support to R&D are by far the most dominant policy lever. As figure 6 indicates, nearly 40 per cent of examined policy instruments in the total Trend Chart Inventory are related to R&D and technology.

Figure 6: Research and Innovation Policy Mix in the EU27 – Trend Chart database, 923 Policy Measures



Source: INNO Policy TrendChart 2011

In contrast, only a small share of instruments is related to the fifth main category “Market and innovation culture”. This category includes i.a. design prizes, regulatory policies and innovative use of standards. Although several countries are prioritising innovation in creative industries and social innovation, specific policy measures in these areas seem still to be scarce and at an early stage.

The Trend Chart inventory has of course its limitations when it comes to mapping and categorizing concrete measures under specific forms of innovation. Clearly, the inventory is not intended for this purpose. Few sub-categories are directly relevant for marketing and organisational innovation, and it might very well be the case that the most important and powerful instruments are broader instruments which target all forms of innovation, irrespective of their technological content and focus. Categorizations of policy instruments based on Trend Chart data should therefore be treated with certain reservations.

A further analysis can be made by comparing recent changes in countries’ innovation policy mix, as reported in the so- called Mini Country Reports made for INNO Policy Trend Chart and

ERAWATCH in 2011. Each report contains a short section on recent changes in the innovation policy mix. The changes refer to the period from 2009-2011. A thorough analysis based on all 48 country reports goes beyond the confines of this project. But some general tendencies can be revealed from a brief overview of the country reports:

- An increased emphasis on societal challenges seems to be the most widespread change in the innovation policy mix. Green innovation is clearly the most cited challenge, but health, ageing, security and social cohesion are also frequently mentioned.
- Increasing the linkages and knowledge flows between academia and industry is mentioned by many countries, although this has been a high priority area also in previous reports.
- A number of countries point to indirect measures, R&D tax incentives in particular, as the most powerful funding mechanism in the policy mix. Several countries report a shift towards a larger share of R&D funding through these mechanisms. In some countries (e.g. Netherlands) this shift seems to be ideologically motivated. In other countries the shift is more due to necessary cuts in direct funding, partly as a result of the financial crisis and subsequent reductions of public spending (e.g. US and Spain).
- A stronger focus on innovation in services is reported by many countries, often also related to more emphasis on public sector innovation.
- A few countries highlight new initiatives directed towards design and creative industries (e.g. Denmark and UK). It seems, however, that these measures and initiatives are not among the most powerful funding mechanisms and often restricted to networking and advisory initiatives.
- The area of social innovation is referred to in a number of reports. However, few countries report having introduced major initiatives in order to promote social innovation. The notion of social innovation seems also to be interpreted differently from country to country.

In sum, it is difficult to identify an explicit shift in the innovation policy mix towards more instruments targeting non-technological forms of innovation. On the other hand, some of the general changes may increase the importance and relevance of these forms of innovation more indirectly, for example the stronger emphasis on innovation in services.

The OECD Science and Technology Outlook provide another rich source of information on recent trends in science and innovation policies. The recent 2012 edition covers policy trends in the period 2010-2012 and is based on country reports from all 34 OECD countries in addition to China, India, Brazil, the Russian Federation and South Africa. The major policy trends identified in this material are quite similar to the ones that are highlighted in the EU Trend Chart report: The Outlook observes that most countries have managed to maintain and even increase public R&D investments in the years after the financial crisis. National R&D and innovation priorities are clearly emphasizing so-called grand challenges as well as new sources of growth. Policies for human resources are increasingly included in national innovation policies, but seem in general to maintain the rather traditional focus on science and engineering (OECD 2012)

The OECD Outlook also looks at trends in the mix of policy instruments. For this last edition, countries were asked to rate the balance of their policy mix for three periods; ten years ago, at present and in five years. The most striking finding is a general trend from direct to more indirect support measures, such as tax-incentives for R&D. The country responses also indicate a certain development towards more demand-side oriented policies, although supply-side measures prevail in most countries. Particularly interesting in this context is the balance between technology-oriented versus non-technology oriented policies. According to the Outlook, country responses give no clear indication of a general shift from measures targeting specific technologies towards broader “technology-neutral” instruments.

The strong persistence of technology-targeted instruments may seem somewhat surprising, given the increased emphasis on broader innovation policies described above. However, there are some interesting country differences in this area. According to the OECD, Brazil, Greece, Slovenia and UK are among the countries which are moving towards more technology-targeted measures, while China, Finland, Germany and Switzerland report a trend towards more generic and not technology-targeted measures. This leaves a rather mixed picture, and it is difficult to judge whether many countries are trapped in some kind of “technology inertia” or if non-technological forms of innovation are to a larger extent incorporated in technology-targeted policies.

6.5 Innovation governance

In most countries innovation policies have emerged from the science and technology portfolio and/or from policies for entrepreneurship and business development. But countries vary a great deal as to where and how innovation policy is placed in the government structure. These differences are not without importance. Indeed, policy-making involves heavily institutionalised processes, where the institutional set-up and division of labour runs the risk of inertia and policy lock-in (Remoe 2008). This represents already a particular challenge for the governance of cross-sectoral policy areas like innovation. Furthermore, the aforementioned broadening of the innovation concept makes it even more topical to discuss where innovation policy actually belongs in the government portfolio. Of course, innovation governance is not only about coordination on the ministerial level. Innovation governance involves a large set of actors in the innovation system and their interplay. Hence, innovation governance has a regional dimension, an international dimension and a vertical dimension in the relationship between ministries, sub-ordinate bodies, regulatory agencies etc. However, in this limited context we will focus on the ministerial level.

In recent years, some countries have renamed and added the innovation portfolio to established science ministries (e.g. Spain, Denmark in 2008), others have gone further and created so-called super-ministries with a combined responsibility for innovation policies and a number of other high-priority areas (e.g. UK, Finland and the Netherlands). And although many countries continue without an explicit innovation Ministry and Innovation Minister in title, there is a tendency towards upgrading innovation as a distinct policy area in the government structure. An increasing number of countries have also established dedicated science and innovation advisory boards in order to tackle the considerable coordination challenges within innovation (OECD 2012). In many cases

innovation is added to the responsibility of already established science advisory boards. More interesting than the mere appearance of the term innovation, is *where* the main responsibility for innovation is placed in the governance structure. A simple mapping of the division of labour between ministries in 25 European countries is provided in Annex 4 to this report. This overview reveals a rather traditional pattern.

In the vast majority of countries, the responsibility for innovation policy is placed within ministries responsible for Science/R&D or economy/industry. This is clearly the dominant portfolio. Some countries have also connected innovation policy to specific sectors, such as ICT (France and Austria), Agriculture (Netherlands) or shipping (Greece). Not surprisingly, some of the smallest countries have ministries with rather multiple portfolios, but this is probably more due to pragmatic reasons than holistic innovation thinking.

Given the increased emphasis on innovation for grand challenges, it is interesting to note that few, if any, countries have chosen to combine the political responsibility for innovation with areas like health, environment or energy. In the perspective of organisational innovation, it is also worth noticing that few countries combine innovation with employment policies. Finland, UK and Ireland are exceptions in this respect, as they have a model where innovation policy is closely related to employment and skills policies. Culture and related policy areas are rarely connected with innovation on a ministerial level, although the multiple portfolios of ministries in Portugal and Bulgaria include both innovation and tourism.

In summary, we find little evidence that the broadening of innovation policy towards non-technological dimensions, as stated in the visionary documents, is reflected in the ministerial set-up and division of labour between ministries in European countries. However, Finland and UK are interesting cases to watch because of their deliberate coupling of innovation policies with skills and employment issues.

6.6 Rationales for policy

Another crucial question in this study is whether policies supporting marketing and organisational innovation can be justified according to systemic and/or market failures. The existence of market and systemic failures from a firms' perspective is thoroughly discussed in the previous chapters. But the question of whether market or system failures can and should be corrected is indeed a policy question. In the current situation, with most European countries facing severe fiscal constraints, the question of justifying public expenditure becomes even more topical. This is the case for all policy areas, including innovation policy.

Until recently, the notion of market failure has been the most important rationale for government intervention in the field of innovation. And although the broader systemic view of innovation systems has inspired policy-making for several years, it is still unclear to what extent the notion of system failure has influenced the real rationales behind public intervention in innovation. Dodgson et al. claim that most policy prescriptions are based on market failure, despite the increasing understanding of innovation as a systemic phenomenon. In their view, the persistence of what they

refer to as “conventional market failure justifications” is due to a predilection for this rationale from the OECD, which in turn is largely inspired by the US tradition of “laissez-faire”-policies. Hence they suggest that “systemic failures are mentioned but policy prescriptions are less clear” (Dodgson et al 2009).

However, recent policy documents indicate that both the OECD and the US are paying more attention to the importance of systemic failure. The OECD Science Technology and Industry Outlook from 2010 contains a whole chapter devoted to a discussion of the rationales and policy mix for innovation policy. In this chapter, the OECD recognises both the existence of market and systemic failures, stating that the latter is an extension of the former. Among other things, the OECD notes that “[...] governments can, in principle, make a difference by funding basic and strategic research, supporting innovative SMEs, e.g. by helping them to develop their absorptive capacity, fostering networks and other system linkages, and providing strategic intelligence as a public good to inform actors throughout the innovation system”. This clearly indicates an increased understanding of systemic failures as justifications for policy intervention.

Furthermore, the recent US innovation strategy (2011) seems to upgrade the role and importance of systemic innovation thinking. For instance, the strategy goes far in the direction of criticising previous laissez faire strategies, while at the same time warning against policies attempting to pick winners. Illustrative in this respect is the statement that “the true choice in innovation is not between government and no government, but about the right type of government involvement in support of innovation. A modern, practical approach recognizes both the need for fundamental support and the hazards of overzealous government intervention.”

A look at some other recent national innovation policy documents reveals some interesting country differences. The recent UK “Innovation Strategy for research and Growth” (2011) acknowledges both market and systemic failures and discusses the relationship between the two types of failure. Regarding systemic failure, the strategy emphasizes in particular the coordination problems which arise when innovation results in new technologies and new solutions which, in turn, require corresponding changes in both organisations and regulatory systems. Concerning this challenge, the strategy states that “government has a fundamental role in addressing systemic failures”.

A quite recent Norwegian white paper on innovation policy instruments (Norwegian Ministry of Trade and Industry 2012) also includes a chapter on the rationales for policy intervention. However, this chapter mainly focuses on classical market failures such as externalities, common goods and information asymmetries. System failures are not addressed explicitly, although the document itself contains a number of policy measures which address system failures.

A general impression from these examples is that the notion of systemic failure has gained in importance in general innovation policy. But apparently, most concrete policy instruments are justified by and targeted towards correcting market failure. Policy documents seem rather unclear when it comes to specific policies and measures targeting systemic failures.

Edquist proposes a more pragmatic approach to the question of rationales for policy intervention in the innovation area (Edquist 2011). His main point is that government intervention in this field must be based on a specific and identified *problem*. Moreover, this problem must be related to the

innovation performance of the system and not to the broader economic and societal problems where a number of other determinants and factors may be more important for the solution of the problem. A final condition for public intervention, according to Edquist, is that policy agencies and actors have the ability to solve or mitigate the identified problems in the innovation system. This latter point is slightly similar to the conditions for intervention according to the market failure theory.

Although clearly embedded in the innovation system thinking, the “problem-based” approach described above seems to move one step away from the market vs. systemic failure debate, as it replaces the concept of *failure* with the term *problem*. This way, rationales for public intervention are not confronted with the problem of defining *imperfections* in the system or the market, but instead focused on identifying problems. This might be a fruitful approach, since policy-making is more oriented towards practical problems than based on systematic diagnostics of imperfections in markets or systems. The latter point is also observed by Edquist and Saturauta in their interviews with Finnish policy makers (Edquist et al. 2009), and to a large extent confirmed by our own policy interviews which will be described in the following chapter.

6.7 Interviews with policy makers

One way of opening the “black box” of policy making is to interview practitioners in the field of innovation policy. Our policy assessment therefore includes seven telephone/face-to-face interviews with policy makers in six countries (Germany, France, Netherlands, Denmark, Norway and Finland). This approach serves as an important supplement and corrective to the desk-top studies described above.

Two interviews were on the agency level (TEKES/Finland and Innovation Norway), while the remaining were with persons in Ministries responsible for innovation. All interviewed persons were experienced senior officials with a broad overview of innovation policy. A list of interview partners is provided below and the interview guideline is provided in Annex 2. The findings from the interviews are drawn together and presented in a generalised way, partly for reasons of confidentiality.

Table 49: Overview of conducted policy interviews

Country	Ministry/agency	Policy makers interviewed
NL	- Dutch Ministry of Economic Affairs, Agriculture and Innovation	- Mr. Arie C. van der Zwan, Senior Policy Adviser
	- Dutch Ministry of Economic Affairs, Enterprise and Innovation	- Ms. Saskia de Smidt, Senior Policy Advisor
NOR	- Innovation Norway	- Mr. Per M. Koch, Special Adviser, - Mr. Pål Aslak Hungnes, Director for Corporate Governance
NOR	- Norwegian Ministry of Trade and Industry	- Ms. Kjerstin Spjøtvoll, Director General - Mr. Tor Ivar Wammer, Senior Adviser

DEN	- Danish Agency for Science Technology and Innovation	- Mr. Thomas Alslev Christensen, Head of Division
FRA	- French Ministry for Productive Recovery (Ministère du redressement productif)	- Mme Lise Fournier, Head of the innovation policy office/Chef du departement
GER	- German Ministry for Research and Education (BMBF)	- Dr. Jan Wessels, Division for Innovation Policy Issues
FIN	- TEKES –Finnish Funding Agency for Technology and Innovation	- Dr. Jari Romanainen, Executive Policy Adviser

6.7.1 General assessment of national innovation policies

Overall, the respondents judged their national innovation policies as broad and hence well in line with the last revision of the Oslo Manual from 2005. There seems also to be general agreement that the scope of innovation policies has broadened over the last 10-15 years. Our respondents from the Netherlands were, however, a lot more moderate with respect to the general broadening of innovation policy in their country. This was largely due to the hands-off and enterprise-driven approach by the minority liberal/conservative government then in office (now resigned). This policy included a general shift from direct measures towards generic instruments, such as tax incentives innovation credit schemes and improvement of general framework conditions. In our respondents' view, this ideological shift had reduced the role of instruments targeting specific issues, including non-technological innovation.

All countries, including the Netherlands, highlighted an increased emphasis on societal or so-called grand challenges in their innovation policy. In Germany and Finland there has been a strong focus on more demand side and market pull strategies, while France, Norway and Denmark emphasized an increasing attention towards service innovation. The latter is also the case in Finland, where the national innovation agency TEKES' funding for service innovation is roughly equal to technological innovation. Furthermore, all countries had seen a general development from technology-focused innovation policies towards a broader approach which includes non-technological forms of innovation. This shift was particularly emphasized by France and Finland. In addition, all countries mentioned an increased focus on innovation in the public sector.

6.7.2 The role of marketing and organisational innovation

The policy interviews indicate clearly that the concepts of marketing and organisational innovation are well understood and accepted, but not operational concepts in innovation policy design. Denmark stands out as an exception in this respect, as both marketing and organisational innovation seem to be frequently used in practical policy making. Our Danish respondent also emphasized the importance of combining these two forms of innovation. Apparently this is a concern for the Danish ministry in the design of new policy instruments.

Although marketing and organisational innovation are not so common terms in practice, all countries mentioned a number of related concepts which were more frequently used. Regarding

organisational innovation, the Netherlands and Germany referred to social innovation as the most relevant area. This is closely related to organisational innovation, but slightly more oriented towards the quality of working life (e.g. social security, labour regulations and working environment) than organisational innovation, which focuses more on creativity and learning processes at work. Norway and Denmark focus on employee-driven innovation, while Finland pointed to their large programme for working life development. The scope of the latter programme is, however, more directed towards organisational innovation, since the objective of the projects is to develop and adopt new organisational arrangements, i.e. processes, teams, structures, methods, etc. in collaboration between the employer and the employee.

As for marketing innovation, most respondents pointed to various initiatives for design policies. The two interviews on agency level in Finland and Norway revealed a more broad-ranging focus on market orientation. In both countries this was based on a clear experience that firms until now have focused too much on product development instead of understanding and the needs and potentials in the market.

6.7.3 Targeted policies and measures

Clearly, the most powerful and wide ranging instruments mentioned in the interviews are broad measures which are neither targeting nor excluding non-technological forms of innovation. This seems to be the case in all of the interviewed countries, although most of the highly profiled instruments still have a clear focus on R&D. In Norway, the Ministry of Trade and Industry has had a deliberate strategy of bundling previously narrow and targeted instruments into broader and more technology-neutral instruments. Apparently, this has not prevented funding of non-technological innovation. On the contrary, our respondents from Innovation Norway reported that an increasing part of their project support goes to firms in the service sector, which now receives more than 50 per cent of the agency's total innovation funding.

The Danish "SPIR" and the French "Pôles de compétitivité" were both highlighted as examples of large industry-science cooperation platforms which include projects within non-technological innovation. The French pôles have traditionally been dominated by technology-oriented projects, but comprises now at least five initiatives with design and non-technological elements. The Danish SPIR-programme also includes some projects in the non-technological area, including a recent call for projects within "smart society".

The so-called "Top Sectors" are undoubtedly the most powerful instrument currently in place in the Netherlands. These are large-scale initiatives directed towards nine broad business areas. The Top Sector approach has concrete implications for a number of innovation actors in the Dutch system, for instance through reallocation of resources from research institutes and funding agencies to the Top Sector activities. The Top Sectors do not represent a significant shift towards new forms of innovation yet, as this is still under consideration. The most relevant initiatives regarding non-technological innovation are the two Top Sectors within Logistics and Creative industries. The latter includes i.a. an experiment to investigate how specific innovations in the creative industries fit with current definitions and measures for R&D and innovation.

In Germany, the new High Tech Strategy identifies five challenges to be addressed by innovation policies: Climate Change and Energy, Health and Nutrition, Mobility, Security and Communication. Specific technologies and innovation policy is now to be oriented towards broader themes and the needs for new technologies and innovative solutions. This new approach includes an increased focus on innovation in creative industries.

French policies include a relatively rich portfolio of design-related instruments, in particular targeted towards SMEs. In general, many of the French instruments in the area of non-technological innovation are directed towards SMEs, partly because this is part of the portfolio of the Ministry in charge of innovation, partly because the market and system failure is considered more pronounced for smaller companies. As an example of an instrument to correct system failure, France mentioned a web-based toolbox which provides guidance for SMEs on how to integrate marketing innovation in their activities, the so-called “Marketing pour PME”.

The need for raising the awareness of marketing innovation among firms was also strongly emphasised in our interviews with TEKES/Finland and Innovation Norway. In both countries, firms were said to have focused too much on improving their products instead of investigating if there is demand for the product. Hence, both countries have identified a fundamental need to switch from technology myopia to market orientation. In Norway, the national innovation agency has approached this problem by making systematic use of the so-called “Osterwalder method” (named after the Austrian Economist Alexander Osterwalder) which is used in a routinized way to assess all firms applying for grants and support from Innovation Norway. The Osterwalder model takes all applicants through a range of questions regarding their business model, and this is done prior to the assessment of their products.

Equally important in Finland is their strong focus on working life development for innovation. A large Working life development programme (TYKES) has been in place for a number of years, but has recently been deliberately finalized and transformed from a specific thematic programme to a more broad ranging instrument where the working life development perspective is integrated in other thematic programmes under the Finnish innovation agency TEKES. This policy reflects a general focus in Finland on integrating skills, innovation and organisational issues.

The Norwegian Ministry of Trade and Industry was one of the few interview partners who pointed to the issue of intangible assets. More precisely, they recognized the challenges related to collateral for innovative companies with only intangible assets. This is highly relevant for firms with non-technological innovation. Although part of the discussion, policy action in this area seems to be a matter for the future. The issue of intangible assets is also one of the focus areas for the Finnish TEKES content strategy.

Few countries mentioned that the broader scope of innovation has entailed significant changes in the government structure. One exception is Finland's relatively recent combination of innovation and employment policies within a new “super ministry” also covering economic policies. The new French government has also given innovation policy a more pronounced role in the ministry set-up, but still with a rather traditional combination with industry policy, SMEs and ICT.

In addition, countries were asked whether the broader scope of innovation has altered the profile or priorities within R&D policies. Few of the interviewed countries could point to any significant changes in this respect. France and Denmark mentioned a slightly stronger focus on R&D within humanities and social sciences, while Finland has identified a need to better align the business-oriented universities with industry. This linkage appears a lot weaker than the more established link between science and industry. Furthermore, Finland has identified a need for research organisations to refocus larger parts of their R&D-activities to be more market oriented. This implies providing the basis for new start-up enterprises in addition to the traditional role of serving the needs of existing companies. Despite these exceptions, the main impression is that R&D-policies for innovation have a bias towards technology and product development, while policies for non- technological innovation are generally regarded as non R&D policies.

6.7.4 Rationales for policy

All countries were asked about the rationale behind existing policies and instruments, more specifically whether they are justified by market or systemic failure. Apparently, this was a difficult question to answer precisely. The perspective of market failure is well established, but systemic failure seems also to be widely and increasingly recognised as a rationale for public intervention. Even so the interviews leave the impression that the application, selection, and design of concrete instruments are rarely based on a systematic assessment of market and systemic failure. In general it appears that the introduction and design of measures is more subject to pragmatic considerations, while the reference to market and systemic failure is more implicit and part of a general discussion. In Norway, however, a recent White Paper on innovation policy instruments presents a list of eight criteria as guidelines for the design and implementation of sound innovation policy instruments.

Several respondents mentioned that the question of rationales for policies are more often raised in the negotiations with finance ministries, and hence in the final phase of the policy process. In Germany, France and the Netherlands both market and systemic failure were said to be mainly discussed in relation to policies addressing SMEs.

Another general impression was that the rationale of market failure applies when it comes to financial instruments, while systemic failure is more often related to soft instruments, such as networking, mobility and awareness-raising instruments. Finally, there seemed to be general agreement that instruments addressing marketing innovation are most difficult to justify, as they are often accused of implying public support for the commercial activities of firms. It is therefore regarded as a challenge to design policies and instruments which address and stimulate firms' general efforts in understanding the market and orienting their innovation activities accordingly.

6.8 Main policy findings

Overall, we find that the broad concept of innovation is well understood and to a large degree highlighted in recent national innovation strategies. On the practical level, however, this broad-based approach seems not so pronounced, both with regard to the portfolio of instruments, national priorities and the division of labour between ministries.

At the same time one should ask the question whether innovation policies can be too broad. For example, there is reason to question the great expectations regarding innovation as the direct solution to job creation, societal challenges and future economic growth. Therefore one should establish a clearer **link between broad thematic priorities and the concrete contribution of innovation policy**.

Furthermore, there is a need to clarify how horizontal innovation governance can complement thematic or sector policies. With more ministries and actors involved, governments should **rethink the division of labour between ministries** in the area of innovation policy.

There is also a risk that the increased awareness of new forms of innovation creates an artificial division between different forms of innovation. Given that most successful firms combine different forms of innovation, policies should be equally able to promote **combined innovation activity**.

Many countries report that there has been a **shift from direct measures to indirect support mechanisms** for innovation, notably through increased importance of R&D tax incentives. Although countries seem to have mixed experiences with generic instruments, there is a general risk that such instruments reinforce established patterns in the innovation system. Broad and generic support mechanisms should therefore be designed and promoted in such a way that they also include new forms of innovation, i.a. by integrating non-technological perspectives in broad measures. In addition, efforts should be made in order to raise the awareness of generic instruments among “unconventional actors” who are not so familiar with the portfolio of innovation instruments.

R&D remains an essential element in the innovation policy mix. But despite broad agreement about the changing nature of innovation, our analysis reveals very **few corresponding changes in R&D policies and measures**. The thematic profile of R&D-policies should be reconsidered in the light of the increasing importance of non-technological innovation and innovation in services. This includes efforts to increase cross-disciplinary research, in particular between science technology, humanities and social sciences.

Although market failure still prevails as the dominant rationale for public intervention, the awareness of systemic failure is rising. Systemic failure is reported to be most important for soft measures such as network instruments. In general, there seems to be a gap between the market failure thinking of finance ministries and the systemic approach in ministries and agencies responsible for innovation. Hence, there is a need to find **common ground between ministries for discussing rationales** for policies and the right instruments. Policy makers should also keep in mind that more innovation is not always better in all contexts.

7 Summary and conclusion

For decades, the contribution of non-technological fields of innovation to economic growth has been mostly overlooked by empirical innovation research against the background of the prevailing R&D and technology-focused models of new growth theory. But with the upcoming of the evolutionary and systemic perspective the innovativeness and economic performance of firms turned out to be not solely based on either excessive R&D expenditure or only technological innovation. At the latest since the study of Womack et al. on the concept of "Lean Production" it has been broadly acknowledged that changes in the organisation of manufacturing and work processes are able to contribute to firms' competitiveness and economic success. The latest edition of the Oslo Manual of the European Commission and the OECD has taken up this point and proposes an enlarged understanding of innovation. Besides new products, also new services, production methods, markets or new sources of supply and new types of organisation structures can be regarded as innovations if they help to increase competitiveness and economic success.

In the following, policy-makers are confronted with the question whether and how these forms of innovation could be supported by corresponding policy instruments. For instance, some authors argue that non-technological forms of innovation are characterised by lower levels of investment costs and risk, and, are therefore not in need of specific innovation and technology policy support. Moreover, in contrast to technological innovation, the contribution of non-technological innovations cannot always easily be accounted in concrete numbers. For this reason, their economic relevance and thus legitimacy for policy support remains often rather vague. To date, it has not been addressed by previous studies whether and by which firm external barriers and obstacles organisational and marketing innovation are particularly affected and how policy support can be justified and designed against this background.

Being a part of the INNO-Grips research project, this report deals explicitly for the first time with the question whether and to what degree organisational and marketing innovation is affected by specific barriers and obstacles. Moreover, innovation must demonstrate its economic impact to justify further funding. Therefore, to analyse whether and how organisational and marketing innovation could be subject to policy support, the study will differentiate between two essential preconditions: a) the necessary condition that both types of innovation cause positive effects on the economic performance of firms, and b) the sufficient condition that they are affected by market failure in the neoclassical, or system failures in the evolutionary understanding. In detail, this work package study will address the following research questions:

- To what degree are organisational and marketing innovations deployed among European enterprises (manufacturing and services) today, and by which structural characteristics of firms is their usage being shaped?
- Which direct and indirect impacts and effects of organisational and marketing innovation on the firms' competitive advantage and economic performance can be observed?
- To what extent are organisational and marketing innovations affected by external barriers and constraints that in the sense of market or system failures hamper firms' innovation activities? What does this imply for the need and design of policy support?

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- Are there existing policies and policy instruments already in use in EU Member States and beyond to support organisational and marketing innovation? On which aspects of innovation barriers do they focus?

These questions demanded a multidimensional research approach. Quantitative data from the *Community Innovation Survey (CIS) 2008* allowed for a large-scale analysis of the economic effects and patterns that structure the usage of marketing and organisational innovation. This broad picture is based on questions asking for general fields of organisational innovation. Therefore, to get further insight into the black box of the firm, data from the *European Manufacturing Survey (EMS) 2009* was used. Asking for concrete concepts of organisational innovation, it was possible to shed light on what concepts might be linked to certain competitive advantages like product innovation or cost leadership. Both quantitative surveys showed a general picture of the usage of marketing and organisational innovation among European firms, leaving the research question of external barriers which might hamper their usage blank. Therefore 14 firms' case studies were conducted for a first explorative glimpse as to which external barriers could be found among European firms innovating in the field of marketing or their organisational structure at all. The qualitative data showed that the external barriers must be understood in their specific context in order to generate a starting point for future research. Although external barriers were clearly found to hamper some of the projects, the very detailed analysis cannot be generalized whatsoever. For the research on the firm side CIS, EMS and the case studies tackle the research questions with different blind spots for each research approach. Combining those we were able to counterbalance some of the weaknesses, but the broad research question about organisational and marketing innovation among all European firms still limited the possibility of discussing some of the concepts more in depth. Future research could benefit from such an integrated approach by showing the economic influence and overall diffusion of specific concepts in the field of non-technological innovation based on representative firm data covering the macro- economic importance and implications. Case studies supplement the quantitative approach by analysing relevant external barriers in order to be able to design, if necessary, appropriate policy instruments. Therefore the research topics need to be delimited in such a way that the variance in the relevant properties in the quantitative data can be covered by two or three firms' cases in the qualitative case studies.

The linkage between two different research approaches was also basal for the research question about existing policy instruments in the field of marketing and organisational design. A document analysis was used in order to show the existing official position of the political actors on the different levels of political decision-making. This was contrasted with the qualitative data gathered in interviews with policy-makers.

The aforementioned research questions about organisational and marketing innovation have been discussed above in the light of the results of the rich and diverse body of empirical and policy information collected in this report. Based on these findings, we would also like to raise some relevant points and final conclusions for the research and design of policy instruments dealing with organisational and marketing innovation.

KEY FINDINGS

- The academic concepts of marketing and organisational innovation are subject to twofold translation problems. Both terms are scarcely used by enterprises or by policy-makers included in the expert interviews. Instead policy-makers as well as enterprises in particular are more in favour of a problem-oriented approach to innovation. Future research should take this into account by “collecting” them from their individual perceptions, for instance, by developing new measurement approaches.
- The methodological approach combining qualitative and quantitative instruments used by this report has turned out as a feasible approach to address the problem-oriented perception of firms and policy-makers. Quantitative analysis succeeded in the general identification of positive interlinkages of organisational and marketing innovation to firms’ economic success, the identification of a complementary relationship between technological and non-technological fields of innovation as well as of a set of structural characteristics by which the usage of organisational and marketing innovation is being shaped. In addition, the qualitative case studies addressed the problem-oriented perspective of firms and policy-makers and helped to understand the generation and implementation of these innovations within the practical business of firms. By allowing for a larger number of variables that could be taken into consideration, they revealed a set of external barriers affecting the successful development and implementation of organisational and marketing innovation.
- Highly successful enterprises in particular succeed in integrating multiple types of different ingredients of innovation along their competitive strategy. The conceptual differentiation between different fields or types of innovation (i.e. product, service, organizational, marketing innovation, technological or non-technological innovation) often blurs the vision to recognise this aspect. The identification of abstract “complementarities” between different types of innovation might, however, be just a first (but nevertheless important) step towards a detailed policy analysis as they only say little about their causal relationship, which in turn might be highly dependent on market and firm characteristics. Hence, there is further need for research on the causal relationships between different fields of innovation in general and technological and non-technological innovations in particular.
- Organisational and marketing innovations are deployed by a considerable share of European enterprises in order to gain economic success and competitive advantage. But due to the highly complex nature and strong reference to related fields of product innovation (in the case of marketing) and technical process innovation (in the case of organisational innovation), their economic effects are more likely to become visible as indirect effects in terms of “enablers” and “prerequisites” for innovation. Nevertheless, the findings presented in this report show that organisational and marketing innovation can also contribute to firms’ direct economic performance in terms of sales growth and increases in productivity. Based on the analysis of selected organisational concepts, the

findings also depict that different organisational measures vary in their linkage to different economic performance dimensions.

- The firms' case examples revealed external barriers affecting organisational and marketing innovation activities of firms. Because of the single case design, they can, however, not be generalized to the whole universe of European firms. For this reason, they are also not sufficient to derive the need and design of policy instruments specifically aiming to support these two kinds of innovation. Therefore, the research focus needs to be delimited in such a way that the variance in the relevant properties in the quantitative data can be covered by two or three firm cases in the qualitative case studies. But nevertheless, the findings presented in this report provide novel empirical support for the existence of barriers and obstacles related to organisational and marketing innovation and thus help to advance academic and policy debates in this field.

Organisational and marketing innovation as established parts of European firms' innovation strategies

To date, organisational and marketing innovations are widely recognised by firms all over Europe to maintain and increase their economic performance. These findings are supplemented on the basis of a more detailed analysis of selected organisational concepts. Based on data from the *Community Innovation Survey (CIS) 2008* and the *European Manufacturing Survey (EMS) 2009*, it is shown that organisational and marketing innovation as well as the use of selected, concrete organisational concepts has been widely diffused among European manufacturing firms. Thereby, the combination of CIS indicators on a more general level with supplementing indicators aiming at concrete organisational practices and concepts in the EMS survey turned out to be of high added value. While CIS data are primarily oriented at the firm level as the smallest analytical unit, the EMS survey sheds more light on firm-internal processes and allows for opening the "black box" to some extent.

In general, organisational and marketing innovation are today established parts of European firms' innovation strategies. The implementation of new methods of organising work responsibilities and decision-making is the most frequent type of innovation activity with almost a quarter of firms stating that they have been active in this field between 2006 and 2008. New business practices for organising procedures have been performed by one fifth of firms, while new methods of organising external relations pertains to 12% of enterprises in the sample. In case of marketing innovation, media techniques (e.g. social media) for product promotion appear to be the most common type with on average 16% of enterprises being active in this realm. Changes to the aesthetic design or packaging have been performed by 12% of firms. In this case it must be noted that innovation of this kind will mainly be relevant for those firms producing tangible products. New methods of pricing goods and services as well as new methods of product placement or sales channels are relevant for about 10% of firms. With regard to both types of innovation activities, knowledge-intensive services reach the highest share. In the case of new methods of organising work responsibilities and decision-making, more than a third of knowledge-intensive service firms implemented these methods, while the share among manufacturing firms and service firms in

general are both at about 24 percent. One fifth of knowledge-intensive service firms implemented new media or techniques for product promotion. The share of manufacturing is about 13 percent and the share of service firms in general is at about 16 percent.

In particular, concepts aiming at the (re-)organisation of work and production processes like teamwork, task integration, and shopfloor segmentation are widely used today, followed by distinct managerial practices like regular appraisal interviews, knowledge-based systems or quality circles. But the use of such organisational concepts turned out to be shaped by some structural characteristics of firms. For instance, firms which position themselves in the market by an innovation leadership role or the superior flexibility or quality of their products show higher user rates of the organisational concepts considered. Interestingly, cost leadership strategies are not significantly related to the use of organisational concepts. This could be interpreted in such way that cost reduction is not the prime goal of organisational innovation, respectively that the contribution of many organisational concepts to the economic performance of firms lies rather not in decreasing costs. Similarly, the manufacturing of complex products is also positively correlated to the use of organisational concepts as well as the level of a highly skilled workforce and technological intensity. Moreover, the use of organisational concepts is not related to the intensity of R&D-activities but instead to the question whether a firm performs R&D at all. This indicates that organisational innovation rather does not present a strategic substitute to R&D in the sense of a distinct non-technological process innovation pattern. These findings are closely in line with previous studies and reveal the presence of complementary links among all these elements.

Firm size also turned out to have strong and highly significant connections to organisational innovation as well as the performance of R&D-activities by firms. Similarly to technological innovation, the role of firm size might indicate the prevalence of size-related barriers to organisational innovation in terms of the necessary personnel resources and economies of scale which increase the benefits from introducing organisational concepts. Nevertheless, certain organisational concepts themselves might act as enablers of firm growth (e.g. shop floor segmentation, decentralisation of decision-making). As the quantitative analyses conducted in this study did not have the opportunity to use panel data, it has to remain open whether organisational and marketing innovations for example contribute to the strategic positioning of a firm in the sense of an “enabler” or if they are being used *because* of the firm’s strategic orientation.

Organisational and marketing innovation positively related to the innovativeness and economic performance of European firms

Although they do not give empirical evidence about distinct cause-and-effect chains, the findings of this study nevertheless succeeded in revealing positive direct and indirect links of organisational innovation to firms’ economic performance. To start with the innovation performance, our results show positive correlations to the fields of product, service and technological process innovations which underline the strong complementarity of these fields of innovation in firms’ business practice. But despite monitoring all these complementarities, the positive correlation between some organisational concepts and the productivity level remains still significant. Thus, organisational

innovations actually influence firm performance to a relevant extent in both a direct and indirect manner.

Our quantitative findings provide evidence that those organisational and marketing innovation activities that aim at external relations and sales channels have a positive relationship with sales growth. In addition, the interaction of organisational and marketing innovation is also associated with sales growth. Furthermore, organisational and marketing innovations are positively related to other types of (technological) innovation like new goods and new manufacturing process technologies, but also to service innovation. These findings are closely in line with previous studies.

But as the analysis on the level of concrete organisational concepts has shown, not all organisational concepts considered show equally positive correlations. While some are positively linked to one performance dimension, they might have no or even a negative relationship to others. Moreover, for some organisational concepts their positive connection with firm performance becomes only visible if they are deployed to certain intensity. As the performance variables related to product and service innovation show, to assess the economic effect of organisational concepts adequately, it is also necessary to choose the adequate performance dimension. By looking only at the share of turnover that is obtained by new products, the positive impact of organisational concepts runs the risk of being underestimated. As these findings underline, organisational innovation represents a highly complex issue which does not allow for one-size-fits-all approaches. With regard to innovation policy, this means that the design of policy instruments needs to be carefully adjusted to the performance dimension that should be addressed.

These findings from quantitative analysis about the economic benefits are strongly supported and extended by the qualitative case interviews. Almost all firm representatives interviewed considered marketing and organisational innovation to be of high strategic importance. In addition to the quantitative analysis, the firm interviews were able to provide additional information about the interplay between technological and non-technological innovation. They reveal that the relationship between both types of innovation is not a one-way street from technological to non-technological innovation. Thereby, the economic impact varies across the different cases. In some cases there are direct positive economic effects caused by the introduction of an organisational (e.g. reducing manufacturing lead time, improving internal innovation processes, enabling further rapid firm growth) or marketing innovation (e.g. increasing sales growth, establishing a new market position, opening up new communication channels to customers). But indirect effects prevail. In most cases, organisational and marketing innovation served as an enabler for product innovation or contributed as a prerequisite for the firm's general ability to accumulate innovation knowledge and increase organisational learning. As a major finding from the firms' case interviews, the simultaneous and overlapping character of all these innovation activities is highlighted.

Organisational and marketing innovation are affected by firm-external barriers and obstacles

As frequently mentioned before, the explorative character of this study based on 14 firms' case studies mainly contributes to the pioneering identification of possible barriers and problems that might impede firms' organisational and marketing innovation activities. Therefore, the findings of this study provide novel empirical insight on this point, which has not been available to date. However, due to the explorative, qualitative approach the findings from the firm interviews cannot be generalised to the universe of all European firms.

With regard to specific barriers and hampering factors, the firm interviews revealed that a **lack of internal financial, personnel, and knowledge resources** might act as an important obstacle to organisational and marketing innovation. External experts and existing blueprints of organisational or marketing concepts can reduce these costs only to a limited extent, as the existing solutions require a high amount of adaption to the specific frame conditions of the single firm. There was no case in which the firm was able to deploy a ready-to-use organisational or marketing concept. As most firm cases show, the available stock of their own knowledge about marketing and organisational innovation is considered as quite low. However, due to their superior stock of resources, larger firms are more likely to be aware of these innovation fields and have higher internal knowledge about organisational and marketing innovation. Moreover, as particular organisational or marketing innovations (e.g. networking initiatives, public branding strategies) require a certain critical mass, they come along with higher success rates for larger firms. Additionally, in contrast to new technical solutions, especially marketing innovations require firms' constant engagement in order to maintain their positive effects.

Due to the circumstance that the economic benefits of organisational and marketing innovation can hardly be assessed both in advance and ex post to corresponding innovation projects, all firms experienced a **very great uncertainty** which is at least as great as for R&D-based innovation projects. But unlike R&D-based projects which often take place in some kind of "isolated", specialised R&D departments, a failure of organisational innovation in particular affects the "beating heart of the company" and might result in serious damage to the firms' basic business processes. Hence, the risk of organisational innovations might reach beyond the direct financial risk. Nevertheless, most of the firms interviewed felt unable to assess the risks and benefits of organisational and marketing innovation because of the lack of an established set of indicators and ratios. As a consequence, especially organisational innovation has rather appeared as a reactive strategy of firms to cope with current problems than a proactive innovation pattern which is part of the firms' strategic planning process. Specialized departments for marketing were the basis to give the activities in that field a strategic perspective and a continuous development.

In consequence, none of the firms interviewed had a dedicated staff position for organisational or marketing innovation before the innovation project. But as the lack of such specialists is perceived to reduce the absorptive capacity to identify new organisational or marketing solutions as well as to decrease the ability to find external partners for such projects, some firms started to employ dedicated personnel resources during the implementation processes. Hereby, only one firm reported problems in finding qualified employees for their newly created marketing department.

The difficulties in measuring the positive effects and costs of organisational and marketing innovations results in **problems to attract external financing and capital**. The innovation projects were predominantly financed by internal funds in all considered cases. Only a few firms state that they made additional use of public policy programmes in terms of finding opportunities to embed an organisational or marketing innovation in a technical or R&D-based innovation project. Especially the lack of material collateral (like machinery to be bought for a technical process innovation) is seen as an obstacle to attract external funding. These findings remain stable for all countries and sectors that were considered by the firm interviews.

Finally, despite the limited possibility to transfer organisational or marketing solutions directly from one firm to another, knowledge and experiences from external partners were considered as very important by all firms for the success of organisational and marketing innovations. But there different interactive patterns for organisational and marketing innovation appeared in the past. While in the case of organisational innovation the necessary information for organisational innovation predominantly came from close ties with partners along the value chain, loose ties to universities, marketing agencies or other firms were of great value for marketing innovation. But almost all firms state that they perceived a **lack of platforms, databases or arenas in which existing organisational or marketing solutions can diffuse** across different sectors and niches. They are not aware of an institutionalised mechanism (like the patent system in case of technical inventions) to stimulate the diffusion of such types of non-technological innovation and would highly appreciate initiatives to develop such platforms.

In most countries, organisational and marketing innovations are addressed by current policy instruments in an **indirect manner**. Many countries report a shift from direct measures to indirect support mechanisms for innovation, notably through increased importance of R&D tax incentives. Since successful innovations often evolve from a combination of both technological and non-technological forms of innovation, there is reason to promote non-technological innovation by broad instruments. On the other hand, countries seem to have mixed experiences with generic instruments. For instance, there is a general risk that such instruments reinforce established patterns in the innovation system and favour “the usual suspects”. Broad and generic support mechanisms should therefore be designed and promoted in such a way that they explicitly include new forms of innovation. In addition, efforts should be made in order to raise the awareness of generic instruments among “unconventional actors” who are not so familiar with the portfolio of innovation instruments.

Policy conclusions

From the **methodological perspective**, the work package study has revealed some limitations of available measurement approaches and indicators used by quantitative surveys. First of all, both measurement concepts of CIS and EMS are not able to adequately deal with the complex and intertwined nature of a firm’s (process) innovation activities. As a result, it cannot be clearly stated to what extent the introduction of an organisational or marketing innovation simultaneously overlaps with aspects of technological product and process innovation, respectively service innovation. Secondly, as the analysis of different single organisational concepts based on EMS

data shows, it is not sufficient to ask questions about the implementation only on a rather comprehensive level. Furthermore, it is not sufficient to only ask if they are implemented at all, since some economic benefits of them do not become visible until they have been diffused within the firm to a certain intensity. Thirdly, and perhaps most critical, most of the existing measurement concepts (also CIS and EMS) transform the abstract differentiation between different types of innovation (e.g. technological, non-technological, product, service, technical process, organisational and marketing innovation) directly into corresponding questions. While the distinction of different types/dimensions of innovation is without any doubt useful in the course of academic research, the firms' case interviews impressively showed that this does not apply to the reality of business processes within firms. Hence, measuring innovation activities in such a way might force firms to assign their innovation (e.g. introduction of an advanced ERP-system) to a certain category, although it contains technological as well as non-technological elements. The same accounts for the connection between product and marketing innovation, which are mostly not separated in the perception of firms. Instead, their perception of innovation activities is more oriented towards specific problems to be solved on behalf of innovation activities. At least the firms included in our case studies neither apply categories like technical or organisational process innovation nor marketing innovation as separated from product innovation, since there are often no clear borders between different fields of types of innovation.

In consequence there is a great need to **further develop and refine indicators and quantitative measurement concepts** to deal with the complex and complementary nature of firms' innovation activities in a more appropriate manner. This accounts for both, the input side of innovation activities as well as the output side. As shown by our analysis, the benefits of organisational and marketing innovation frequently become visible in a more indirect manner ("enabler and "prerequisite" of innovation and economic performance). But also with regard to their direct effects it is important to choose "adequate" performance measures. For instance, the correlations of organisational concepts on product innovation became only statistically significant when looking at the share of product innovators within the past three years while there was no significant relationship to the share of sales with product innovation.

Against this background, the **deployment of qualitative case interviews** turned out to be a very fruitful approach. As they allow for researching contemporary phenomena within a real context and dealing with a high number of influencing variables at the same time, they can provide large amounts of additional information that can hardly be generated by quantitative research. Although the findings from case studies cannot be generalised to the universe of firms, they nevertheless could play an important role in the identification of relevant empirical dimensions and thereby can contribute to the future development and refinement of quantitative measurement approaches. Since organisational and marketing innovation are relatively new concepts and hence scarcely used in innovation measurement, there is definitely the need to make use of the indicators and combine them with empiric evidence from "the shop floor". One widespread myth among policy-makers seems to be that organisational and marketing innovation is limited to particular creative sectors, while the evidence provided by this report clearly demonstrates that this is not the case.

With regard to **policy instruments directly supporting organisational and marketing innovation**, one of the major barriers to organisational and marketing innovation perceived by

firms is the suboptimal diffusion of innovation knowledge and previous experiences about their implementation within the existing collaboration networks. Firms with a high degree of non-technological innovation are characterized by a large degree of intangible assets. However, such assets are difficult to use as a collateral for loans, due to the lack of systematic measurement and valorisation of such assets. Thus, improving the understanding, the measurement and the valorisation of intangible assets is a future matter for policies on non-technological innovation.

Against the background of the quantitative and qualitative findings about the strong complementarity and interrelation between organisational and marketing innovation with technological innovation like product or technical process innovation, we would suggest **strengthening the role of combined policy instruments to simultaneously stimulate technological and non-technological innovation activities**. As the case example of Zotter shows, firms which are successful at an above average level (e.g. “Hidden Champions”) are frequently able to develop an integrated strategy that consists equally of a set of adjusted and perfectly fitting non-technological and technological innovation. Based on our experiences from the evaluation of national innovation and technology programs, it is not sufficient for successful innovation policy to assume that technological innovation will automatically come along with organisational and marketing innovation as some kind of “collaterals”. The case interviews underline that many firms are not aware of organisational or marketing innovation as a possibility to increase their economic performance. In contrast, many firms develop and implement new products or technological processes without realising significant improvements in their performance because they are not accompanied by the necessary changes in the work organisation or market positioning and customer communication. However, major technological challenges and system transformations, for instance in the field of electro-mobility, energy and resource efficiency have far-reaching consequences for the design and organisation of production processes and require new business models and types of marketing to fully unfold their potentials.

Moreover, even if firms recognise the opportunities for organisational and marketing innovation, the “collateral” development of organisational and marketing innovation is mostly characterised by a rather incremental character due to the scarce knowledge-base of firms concerning these fields. A combined policy approach could thus not only help to increase the principal awareness of firms about organisational or marketing innovation as an important complementation to technological innovation that might help to achieve benefits and profits that are far above their sum. It could also help to strengthen the sustainable development of related competences and knowledge about organisational and marketing innovation and to establish a specific set of personnel and financial resources devoted to them. In the long run, this is likely to result in an increased absorptive capacity for external knowledge about organisational and marketing innovation that in turn might improve and complement the internal knowledge stock of the firm. As it is also shown by the firms’ case analyses, the lack of organisational and marketing activities as non-technological counterparts of product or technical process innovation is not primarily a problem of the intensity but rather of general aversion or ignorance, which could be relatively easily dealt with by such integrated policy instruments. One concrete example of such an integrated approach is the Finnish Workplace Development Programme – TYKES. After a long and successful history as a specific support programme for working life, the programme was deliberately brought to an end as a

specific programme and incorporated in the portfolio of the national innovation agency TEKES in order to integrate workplace development issues in more technology-oriented projects.

Finally, departing from the findings presented in our analysis we would, however, **dissuade policy-makers from supporting single organisational or marketing concepts in isolation.** Due to the highly firm-specific and heterogeneous characters of innovative solutions, an organisational or marketing innovation that fits one firm's need might not be suitable for other firms faced with different internal and external requirements regarding their existing processes, products, and market and customer expectations. As pointed out earlier, there are no one-size-fits-all solutions that are applicable to all firms in a similar way. Instead, it is more important to increase the firms' ability to identify and adapt organisational or marketing concepts to the specific needs of their own situation and frame conditions. In our opinion, this could also be achieved by the previously mentioned policy options without prescribing certain "good" solutions in advance. Moreover, especially in the case of marketing innovation, such a policy strategy runs the risk of getting into conflict with the principle of the pre-competitive nature of innovation policy. Supporting selected marketing concepts could mean giving preference to a certain group of firms and distorting competition by financing the creation of market barriers for other firms. Several policy-makers mentioned this specific challenge in respect to marketing innovation. At the same time there seemed to be broad agreement that there is a need and a rationale for policy intervention also in this area. The most viable solution seems to be through policies which address firms' general and early stage efforts in improving their market orientation and adapting their innovation activities according to present and future market needs.

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9 Annex

Annex 1: Guided open questionnaire for the case studies

Pre-interview notes:

- Our research project deals with companies which have introduced new solutions/methods/approaches in marketing/organisation
- Interview: (basic) **Talking** about the introduction process, no preparation, no specialist knowledge etc. necessary. Participants should only talk about their experiences!
- **Contact-sheet**
- Which changes were introduced in the area of marketing/organisation (--> modify manual if necessary)?

Manual for case studies for organisational innovations and innovations in marketing

*Brief introduction of the project and the interviewees, agreement of time horizon and **recording** (?). Agreement as regards confidentiality and/or company name. Clarifying schedule for the interview, if necessary.*

1. Starting the interview: Questions about areas of activity and company

First of all we would like to ask you to talk briefly about what your activities are in your company and in the context of the changes in marketing/organisation.

- (Could you briefly explain how you came to work for company XY?) Since when have you been working for company XY and what are your **responsibilities**? What were your responsibilities when the changes were introduced in ...?
- Company information (if it cannot be researched beforehand): industry/sector, main product (product group), number of employees, qualification structure, turnover, R&D expenditures
-

2. Describing the “introduction process”

Our research project deals with companies which have introduced new solutions/methods/approaches in marketing/organisation. You have in your company ... (Clarify in advance which changes should be discussed. Discussion of concrete innovation projects)

- What did your company change in marketing/organisation? Which **subject areas** have been changed? What were the **objectives** [e.g. regarding as a key differentiator from

competitors: product price, product quality, innovative products, modifying products according to customers' wishes, adherence to delivery dates/short delivery times, facilities/services. Others: network entry, changes in the market, lack of knowledge of ...]? What were the **reasons**/ Why were these changes addressed?

- Which **persons, employees, parts of the company** were involved? Who has which responsibilities?
- What was the **time frame**? Which employees generated the first ideas? Who started the initiative? Who gave the "go-ahead"? What did the original plans intend, also compared to the first concept stage? How did the implementation go? How did the plans have to be modified? What is the **current level** of implementation/ Which measures are still pending?

3. Narrative phase including follow-up questions and consolidation:

Tell us about the process/project to introduce You can talk about the process from the beginning up to now, describe work processes, about typical situations, positive experiences and challenges

Means/resources and processes of change

- What was new for your company when was introduced which went beyond the new form of organisation/marketing? How radical/extensive were the changes for your company?
- All in all, which **learning processes** were necessary? How were the learning processes organised, were training sessions organised? What was / which topics were new for the different employees?
- What were the **means/resources** (e.g. working hours, project groups, equipment, external training sessions) used to implement the "changes"?
- How were the **means/resources** for the project/process of implementation made available? Who **approved** these resources? Was it possible to achieve all of the objectives with the means available? What restrictions did the budget impose?
- Were **existing solutions** in the area of marketing/organisation **changed/supplemented/replaced**? Did this create difficulties in bringing the changes in line with existing solutions/processes/competences?

Involved actors:

- What was the **employees' significance/ role** for **developing/ implementing** the changes? How did the innovations change the work/the work content, what were the challenges? Did new employees join the company due to the changes/innovations?
- What was the customers' significance/role for developing/ implementing the changes? Were customers directly involved?

- What was the **significance / role** of (important/new) **suppliers/business partners** for implementing the changes in ...? How were suppliers involved in the process of change?
- Were **other external partners** (specialized advisors, research institutions, governmental institutions, parent company) important for the innovation process? How were these partners “found”/ chosen / involved? What were the challenges? Talk about cooperating with these partners!

Strategic point of view, market situation and competition:

- Did you have examples / pioneers / best-practice examples for guidance?
- Do you see the possibility / the danger that competitors are going to successfully imitate your new procedure? Have you taken any measures to protect the changes/ gained know-how?
[Yes] Which measures? Were such measures also new for your company? [No] Have you considered different measures? Why did these not appear to be suitable?

Funding instruments, state and regulation:

- Did you receive **funding** or support **from public institutions** (national government, organisations, EU) for the changes in marketing / organisation? Have you considered such funding? Have you received funding for other innovation projects?
- Do you know of any **policy instruments** which are (directly or indirectly) relevant for organisational and/or marketing innovation in your company? What kind of policy instruments or measures would you like to see introduced?
- Did you have to take particular **regulations / rules / patents** into account (health and safety regulations, legal regulations, existing patents, standards, certifications)?
-

Other challenges:

- What (other) challenges were there? Were there perhaps new technologies which were introduced to implement the changes in marketing/organisation and which were also challenging?
- Are the actual marketing/organisational innovations introduced **together with product and/or process innovations**? If so, which form of innovations are the drivers of the other(s)
-

4. Conclusion/summary

Finally we would like to ask you:

-
- Have there already been **first successes/effects**? Do these correspond to the expectations? Are there different perceptions of the successes? What about **indirect effects**, (new information for product development, learning successes beyond the immediate context of the project)? How do you assess the cost / benefit ratio?
 - In retrospect, if you could do something differently, **how would you tackle the changes in marketing/organisation now? What would have helped you with the implementation? Do you know policy instruments for funding innovations?**
 - **How do the implemented changes influence your company overall? Which changes were also initiated?**
 - **How do you assess the significance of the implemented changes in organisation/marketing for your company compared to other innovations such as new products or new manufacturing processes? In your opinion, how do these forms of innovation differ? Using a different framework, would you tackle more changes in organisation/marketing?**
 - **What particularly surprised you during the course of the project / implementation process? What was particularly important? What were the central challenges?**
 - Is there anything we have not asked you but which should be mentioned?

Annex 2: Guideline for policy interviews

General background: Our research project deals with both business strategies and practices regarding policies marketing/organisational innovation as well as policies and measures to promote these forms of innovation.

The interview: This interview is about the policy dimension. The interviews are not intended to be representative of policies in EU member countries and beyond. They are rather a qualitative element and a supplementary source of information to the more broad-ranging desk top review of policy documents and available inventories of measures.

Manual for policy case studies for organisational innovations and innovations in marketing

- Brief introduction of the project and the purpose of the interviews (see attached background doc.)
- Agreement as regards confidentiality and/or name of person and ministry/agency.
- Clarifying schedule for the interview, follow up questions by e-mail if necessary.

1. Starting the interview: Questions about roles and responsibilities of Ministry/agency and the actual policy maker

1. First of all we would like to ask you to talk briefly about your roles and responsibilities in your ministry/agency in general and which areas of innovation policies you cover (i.a. specific areas or innovation policy in general?)
2. Ministry/agency information (if it cannot be researched beforehand): Roles and responsibilities in national innovation policy making. Recent policy documents.

2. General innovation policies in country.....

Our research project investigates aspects which are related to the broader concept of innovation. To start with, we would therefore like to ask some questions regarding general innovation policy trends in your country:

1. Given the increased emphasis on the broader concept of innovation in the Oslo Manual (2005) and in OECD and EU innovation strategies (2010), how would you describe your government's understanding of the innovation concept? (in line with, behind, or in front of EU/OECD trends)?
2. Has your country introduced major changes in innovation policy the last five to ten years? If so, in which ways? Ask specifically about possible changes in:
 - a. The design and priorities of R&D policies
 - b. Human resources related to innovation
 - c. Innovation governance (ministerial level, agency level etc.)
3. If policies have changed/broadened, to what extent is this materialized in concrete ways, i.a. through increased funding level, new funding mechanisms or introduction of new instruments (which instruments, name the most important).

3. Political awareness and priority concerning marketing and organisational innovation.

1. Are marketing and organisational innovation a matter of concern in national innovation policies? (i.e. are they particularly prioritized or mentioned in innovation policy documents)?
2. Under which other/broader aspects are these forms of innovation treated indirectly? (e.g. innovation in services, design policies, demand-led innovation etc...)

4. Measures and instruments targeting marketing and organisational innovation.

1. Are there already existing policy instruments in place or planned in your country to support these forms of innovation? Are they targeting these forms of innovation directly or indirectly (i.a. connected to broader purposes and perspectives)

-
2. Please name and comment on the most relevant instruments in place or planned to be introduced. Would you classify each and one of them as
 - a. Economic (tax incentives, funding etc.)
 - b. Regulatory (IPR, competition, market regulation,
 - c. Soft instruments (networking programmes, campaigns etc.
 - d. Meta –instruments (
 3. Have any of these instruments been evaluated or is there any information about the experience and effects of these instruments?
 4. On the background of our emphasis on system and market failure as rationales for policy intervention (sent beforehand) in this field, how would you consider the rationale(s) behind the instruments in place? (i.e. market failure, system failure, other rationales..?)

5. Other aspects not covered by questions above

Are there any other points or information you would like to mention which could be relevant for our study?

6. Relevant documents and further reading

Please mention or come back to e-mail titles and links to relevant documents for further reading about innovation policies in the actual country.

Annex 3: Correlation matrix: marketing and organisational innovation on industries (correlation analysis based on Kendall Tau showed similar results)

		Correlation analysis (Spearman-Rho)					
		New business practice	New methods of organising external relations	New methods of organising work responsibilities and decision making	Changes to the aesthetic design or packaging	Media techniques for product promotion	Methods of product placement or sales channels
Agriculture, forestry and fishing	Corr. coef.	-0.0026	-0.0101 *	-0.0109 **	-0.0162 **	-0.0196 **	-0.0155 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Mining and quarrying	Corr. coef.	-0.0197 **	-0.0138 **	-0.0194 **	-0.0265 **	-0.0241 **	-0.0193 **
	N	61,400	62,679	62,688	62,663	62,663	62,655 **
Manufacture of food products, beverages and tobacco products	Corr. coef.	0.0232 **	-0.0055	0.0063	0.1269 **	0.0195 **	0.0364
	N	61,400	62,679	62,688	62,663	62,663	62,655
Manufacture of textiles, wearing apparel and leather and related products	Corr. coef.	-0.0596 **	-0.0413 **	-0.0565 **	0.0041	-0.0359 **	-0.0144 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Manufacture of wood and wood products, paper and printing	Corr. coef.	-0.0156 **	-0.0227 **	-0.0152 **	-0.0026	-0.0181 **	-0.0118 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Manufacture of coke and refined petroleum products, chemicals, pharmaceuticals, etc.	Corr. coef.	0.0370 **	0.0066	0.0286 **	0.0536 **	0.0144 **	0.0108 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Manufacture of basic metals and fabricated metal products	Corr. coef.	0.0169 **	-0.0062	-0.0017	-0.0233 **	-0.0209	-0.0209
	N	61,400	62,679	62,688	62,663	62,663	62,655
Manufacture of computers, electronics, optical products, machinery, motor vehicles	Corr. coef.	0.0773 **	0.0395 **	0.0570 **	0.0472 **	0.0078	0.0250 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Manufacture of furniture, other manufacturing, repair and installation	Corr. coef.	-0.0085 *	-0.0047	-0.0122 **	0.0303 **	-0.0043	0.0025
	N	61,400	62,679	62,688	62,663	62,663	62,655
Electricity, gas, steam and air conditioning supply	Corr. coef.	-0.0038	0.0064	0.0032	-0.0239 **	-0.0067	-0.0084 *
	N	61,400	62,679	62,688	62,663	62,663	62,655
Water supply; sewerage, waste management and remediation activities	Corr. coef.	-0.0073	0.0038	-0.0025	-0.0376 **	-0.0179 **	-0.0285 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Construction	Corr. coef.	-0.0483 **	-0.0180 **	-0.0320 **	-0.0838 **	-0.0446 **	-0.0599 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Wholesale and retail trade; repair of motor vehicles and motorcycles	Corr. coef.	-0.0453 **	-0.0343 **	-0.0364 **	-0.0271 **	0.0324 **	0.0186 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Land transport and transport via pipelines, water and air transport	Corr. coef.	-0.0491 **	-0.0219 **	-0.0412 **	-0.0566 **	-0.0399 **	-0.0411 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Warehousing and support activities for transportation and postal and courier	Corr. coef.	-0.0031	-0.0036	0.0035	-0.0280 **	-0.0185 **	-0.0216 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Accommodation and food service activities	Corr. coef.	-0.0357 **	-0.0182 **	-0.0245 **	-0.0185 **	0.0191 **	0.0009
	N	61,400	62,679	62,688	62,663	62,663	62,655
Publishing activities, motion picture, video and television programme production, telecommunications, computer programming, information service activities	Corr. coef.	0.0056	0.0184 **	0.0117 **	0.0256 **	0.0302 **	0.0343 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Financial and insurance activities	Corr. coef.	0.0552 **	0.0708 **	0.0613 **	0.0284 **	0.0462 **	0.0496 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Real estate activities	Corr. coef.	0.0605 **	0.0698 **	0.0806 **	0.0459 **	0.0836 **	0.0772 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Legal and accounting activities, activities of head offices; management consultancy	Corr. coef.	-0.0157 **	-0.0089 *	-0.0104 **	-0.0182 **	-0.0004	-0.0142 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
Architectural and engineering activities; technical testing, R&D, market research	Corr. coef.	0.0140 **	0.0049	0.0115 **	-0.0126 **	-0.0075	-0.0052
	N	61,400	62,679	62,688	62,663	62,663	62,655
Other professional, scientific and technical activities and veterinary activities	Corr. coef.	0.0372 **	0.0389 **	0.0302 **	-0.0240 **	0.0002	-0.0067
	N	61,400	62,679	62,688	62,663	62,663	62,655
Administrative and support service activities	Corr. coef.	0.0114 **	0.0125 **	0.0101 *	0.0100 *	0.0116 **	0.0122 **
	N	61,400	62,679	62,688	62,663	62,663	62,655
	Corr. coef.	-0.0114 **	-0.0226 **	-0.0108 **	-0.0342 **	-0.0122 **	-0.0191 **
	N	61,400	62,679	62,688	62,663	62,663	62,655

source: CIS2008, own calculations

*) **= significant at the 99% level, *= significant at the 95% level

Annex 4: Portfolios of Ministries with main responsibility for innovation policy in selected countries. Source: TrendChart/Mini country reports

	Other policy responsibilities attached to main innovation ministry													
Country	Transport/ Infrastructure	Economy/ Business	SMEs/ Entrepr.	Trade	Regional dev.	Science/ R&D	ICT	Agric	Environ- ment	Energy	Health	Education (higher=H)	Empl./ Skills	Culture/ Tourism
UK		X	X			X						X (H)	X	
Germany						X						X		
France		X	X				X							
Spain						X								
Portugal	X	X	X		X					X			X	X
Poland		X				X								
Italy		X				X						X (H)		
Netherlands		X	X					X						
Norway		X	X	X										X (Tourism)
Finland		X	X		X					X			X	
Sweden		X	X	X										
Denmark						X						X (H)		
Austria	X						X							
Czech Rep		X	X	X										
Ireland		X	X										X	
Slovakia		X												
Slovenia		X				X						X		
Croatia						X						X		
Greece	X	X	X			X						X		X (religion)
Bulgaria		X				X				X		X		X (Tourism)
Hungary		X				X								
Belgium (federal)			X			X		X						
Serbia		X			X	X						X		
Switzerland						X								
Turkey		X				X						X		