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Innovation in Services: Typology, case studies and policy implications

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Innovation in Services: Typology, case studies and policy implications

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Abstract

The Norwegian economy is dominated by services. When you design a policy that stimulates innovation, it is important to know what innovation in service sectors is all about. And not at least, what are the most important drivers and obstacles to innovation in this sector of the economy.

In order to grasp the heterogeneity and specific characteristics of innovation in services, we regroup the standard industrial classification. Our five service groups: Problem solvers, assisting services, digital and manual distributive services and leisure services are consistently different with respect to how they create value for their customers as well as what and how they innovate. Among providers of distributive services, process innovations have generated strong productivity growth and thus lower transaction costs for the whole economy. Among problem solvers and providers of leisure services, product innovations have raised quality and enlarged product diversity, which contributes to larger consumer surplus and welfare.

We develop 5 indicators of innovation in services which are designed to help monitoring the innovative patterns over time and across sectors. The share of firms that report innovations is probably the most relevant one. The amount of financial resources devoted to innovative activities is also important. The share of new services in total turnover indicates to what degree the innovators are able to commercialize their innovations. A mobility index indicating how market shares shift between competitors says something about the industry dynamics driven by innovation. Finally, productivity growth highlights the overall economic impact of innovation in services. All indicators should be calculated for each of our five service groups, and can be calculated at the 5-digit nace level.

We propose a series of policy measures that the government should implement in order to raise the innovative activity in the service economy. These measures are classified into groups of policy instruments: Measures that improve the market for vital inputs. Activites that bring the innovator closer to the market. Measures that make it simpler for market participants to coordinate. Innovation friendly regulations and finally, instruments that support the development of new markets for private services.

1 Introduction

Growing demand for services, technological progress and globalization are the three most important drivers behind service sector growth. The mushrooming income in the industrialised world has turned a growing share of the overall demand towards services. The richer you are, the larger is the share of services in your consumption. Over time firms have tended to concentrate resources on core activities, outsourcing important services. This trend has increased the market for externally produced services which to a larger extent is registered in the economic statistics.

The vast technological progress in the ICT-sectors during the last 15 years has reorganized logistic operations and improved the speed and quality of delivery, contributing to a more dynamic international business community. Technological progress has facilitated more service trade over longer distances and between new countries, offering new services to new markets. Wireless communication services, internet auctions, e-trade, and internet newspapers are just a few examples.

Stronger international cooperation and liberalization of international trade opens new markets and creates new competitive challenges for service producers. Although the service sectors have played a dominant role in the Norwegian economy, it is only in resent years that policy makers and industry representatives have devoted attention to innovation in these sectors. The fact that service innovation is a core driver for improved productivity and profitability in the overall economy, has not been on the minds of the general public for long. In an attempt to improve the overall knowledge on this matter, The Norwegian Ministry of Industry and Trade has initiated a comprehensive study of innovations in Norwegian service sectors. This report is an English short version of the main report written in Norwegian.

The study contains the following:

- *A mapping of the more general characteristics of innovation activities in the service sectors.*
- *A mapping of important drivers and obstacles to service sector innovations, with a particular focus on the role of politically controlled measures for innovative activity in Norway.*
- *A list of possible and relevant policy measures which contribute to more service innovation of the kind that improves the Norwegian economy.*

- *10 relevant case studies that highlight the diversity of innovation in the service sectors, and help to identify factors of innovative success.*
- *5 innovation indicators which provide the government with pivotal information on the development of innovative activities in the service sectors and the innovation response to the implementation of new policy measures.*

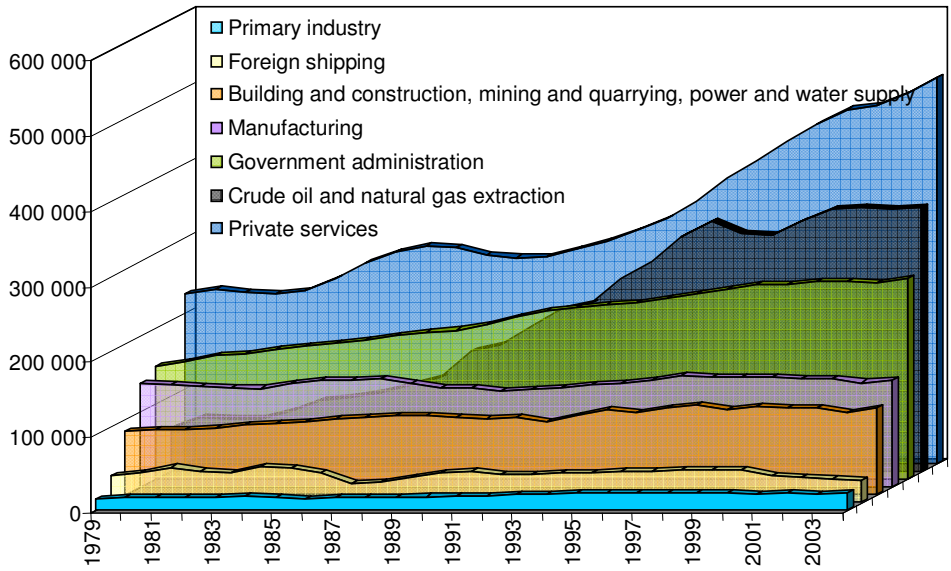
2 Services in the Norwegian Economy

The service sector represents three out of four working hours in Norway. Close to 50% of total employment is found within the private service sectors (retail trade, transport, finance, ICT, tourism, entertainment, business consulting, domestic services etc.). We find approximately the same figures for value added. Furthermore, in terms of value added, the private part of the service sectors is twice as important as the public part. This picture is not that different from what you find in the rest of the OECD countries, where growth in service value added is significantly higher than growth in manufacturing value added. In virtually every OECD country, all employment growth is found in the service industries. Employment in manufacturing, agriculture and fisheries is decreasing, see OECD (2005).

With this picture in mind, it is thus quite surprising that when people describe the Norwegian economy, the focus is primarily directed towards, oil and gas, fish, metals and manufacturing industries.

The booming oil sector has contributed to large changes in the pattern of economic activity in Norway. Sectors with relatively low returns have lost the fight over scarce resources like labour and capital. International sea transport is a typical example. In order to maintain operations run from Norway, firms in this sector have undergone substantial adjustments. Nevertheless, private service providers have flourished along with the growing petroleum activities. During the last years, the growth rate among private sector service producers has actually out-competed growth in the petroleum sector, see Figure 2.1.

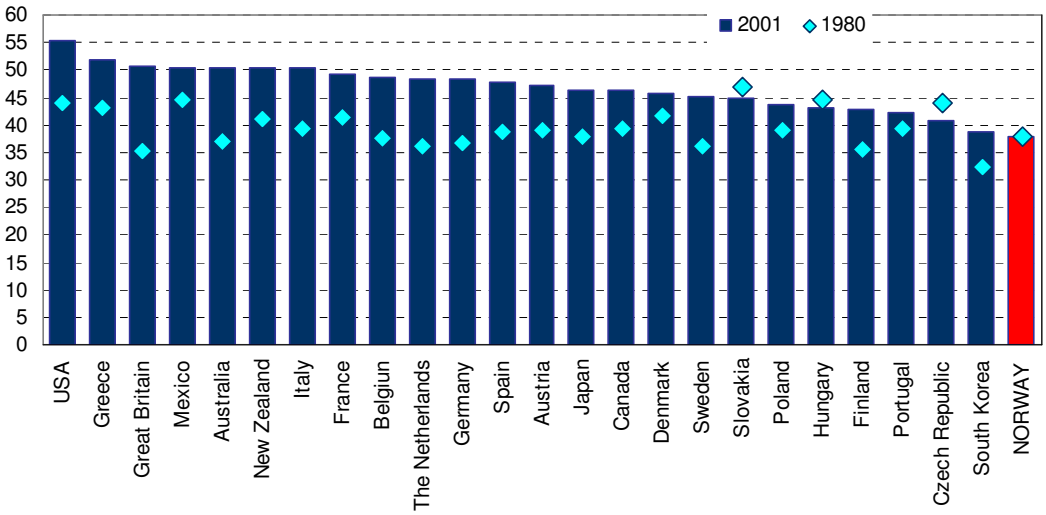
Figure 2.1 Value Added (fixed 2004 prices) for selected industries



Source: Statistics Norway, National accounts

According to the OECD, market-based services represented between 45 and 55 per cent of total value added in most countries in 2001, which represents an increase of 35 to 45 per cent from the 1980 level, se Figure 2.2. The comparatively low share in Norway is mainly due to the large petroleum sector. Market-based services measured as share of mainland value added constitute 48 per cent in both 2001 and 1980.

Figure 2.2 Value added in market based services as share of GDP

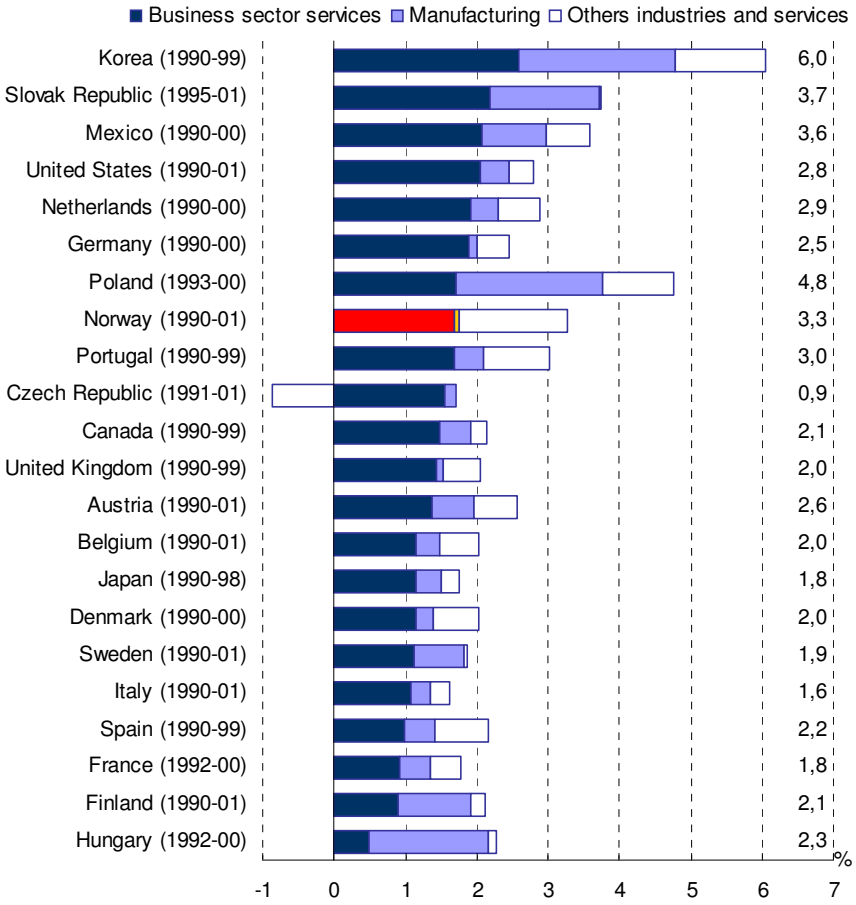


Source: OECD (2005)

Another common feature across OECD countries, is the strong growth in value added in service industries compared to most manufacturing industries, see Figure 2.3. Norway is special here with relatively low growth in the manufacturing

industry and high growth within other industries, most notably the petroleum sector.

Figure 2.3 *GDP growth, contribution from market based services and other industries. Average yearly growth*

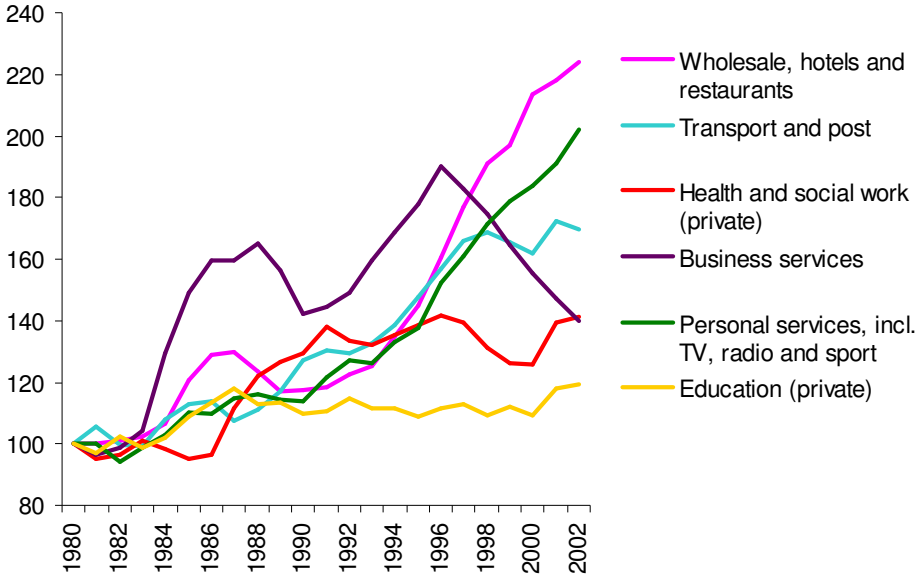


Source: OECD (2005), STAN database

A more detailed look at value added in the Norwegian service sector reveals an outstandingly high growth rate in telecom services. Since 1980, value added has grown by more than 1400 per cent. However, as an effect of the price fall, a large portion of the value added wealth has been transferred into higher consumer surplus. Value added in retail trade has also grown considerably faster than in most other service industries. Norwegian retail trade has grown substantially more efficient, due to organisational changes like the emergence of chains, new concepts within logistics and rapid implementation of new technology. The grocery business has been the driving force in this development since the 1980s, but the trend spread to other trade segments throughout the 1990s. Personal service activities is another service industry that has witnessed a steady increase, see Figure 2.4.

The decline within business activities over the last years is due to decreasing value added within data processing, research and development and other business activities, such as photographic activities and translation activities, as well as advertising activities.

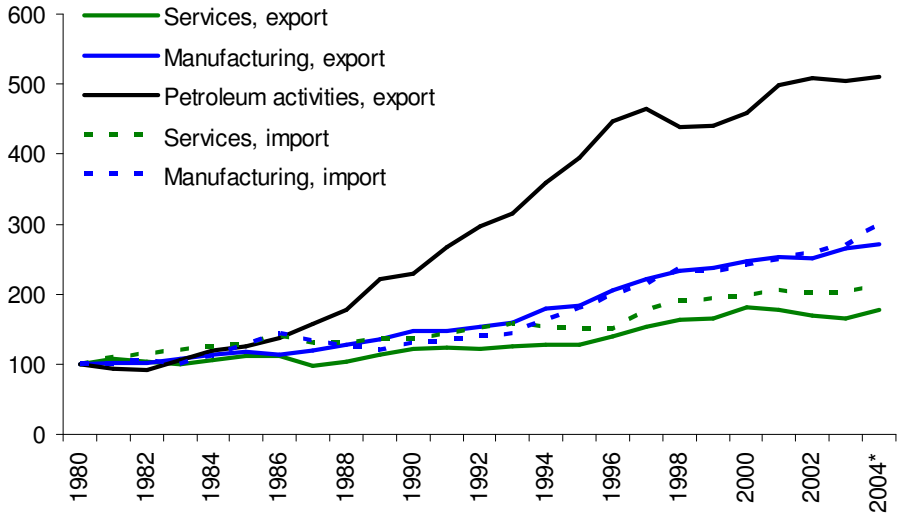
Figure 2.4 Selected services, value added in fixed 2002 prices. 1980 = 100



Source: Statistics Norway, National Accounts

Over time, the export of services has grown steadily, see Figure 2.5. Measured in volumes, Norwegian export of services has grown 2.6 per cent on average since 1980, and 3.3 per cent over the last decade.

Figure 2.5 Norwegian import and export of services, volumes. 1980=100



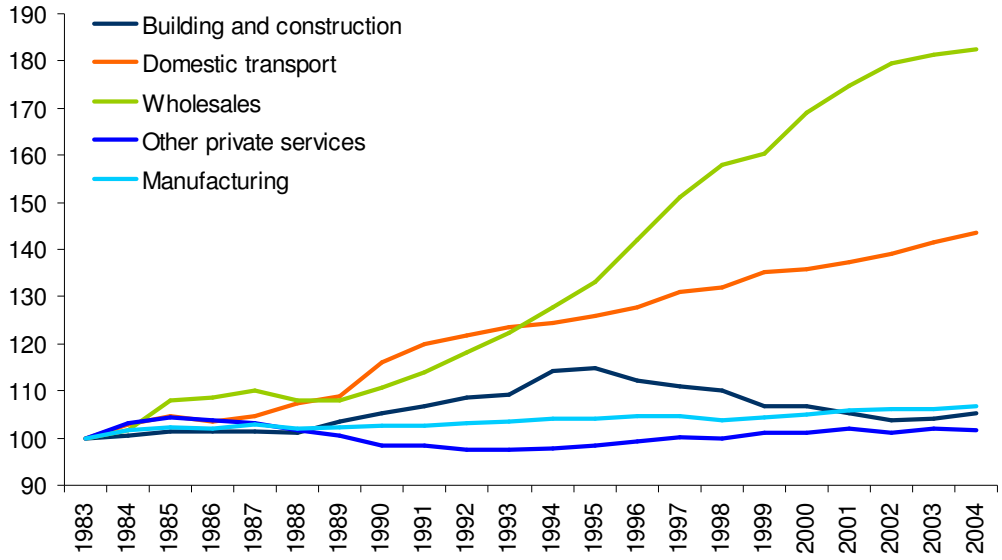
Source: Statistics Norway, National Accounts

Growth in import of services is higher than growth in service exports, the main reason being the relatively modest increase in shipping services.

What industries contribute to a more efficient resource utilization, and which are lagging behind? Several studies indicate that productivity growth varies substantially among Norwegian industries, owing partly to political conditions. These studies tend to conclude that productivity growth is lower in sheltered industries than in industries exposed to international competition.

Based on national accounts statistics from Statistics Norway, we have compared total factor productivity growth in selected service industries with selected goods-producing industries.[1] We have excluded the public sector and the financial sector.

Figure 2.6 *Growth in total factor productivity. Selected industries. 1983 = 100*



Source: Statistics Norway

As seen Figure 2.6, productivity growth over the last 20 years has been strongest within wholesale and retail trade, domestic transport and communication (where telecom constitutes a large share). Our assessment is that this relatively strong productivity growth is connected to significant innovations within trade, logistics and telecom. The most striking development is nevertheless the weak growth in manufacturing, which by and large results from the sheltered food and beverage industry and publishing industry.

[1] ECON (2005d) has recently conducted a study of productivity growth within the banking sector, partly based on a different price deflator than what is employed in the national accounts. The study shows that since 1995, productivity growth within the banking sector has been higher than in the remaining mainland economy.

3 A new Typology of Services designed for innovation studies

When you provide a list of all types of services, from cleaning to telecom, and form dental services to shipping, you get struck by the heterogeneity. Our study shows a close resemblance between the heterogeneity of services and the heterogeneity of innovations in this sector. The innovations are driven by widely different motives, they are directed towards a variety of purposes, and they are affected by policy measures in different ways. We find that the way a service provider creates value for its customers, is highly relevant when you want to identify why firms engage in certain forms of innovation, as well as how policy measures affect the innovative activity. Thus, we construct a service categorisation based on the logics of value creation in this vast sector.

In this report, we define innovation as any activity that contributes to higher value added through renewal and improvements. Consequently, innovation in services basically covers all measures that contribute to higher firm profitability. To get a grip on how such measures contribute, you first have to understand what is special about services.

Often, services are referred to as the opposite of tangible products. In other words, it is not a commodity, it is a service. However, this kind of comparison is based on measures that are not comparable. While products are physical objects, services represent activities. A commodity is something you have, while a service is something you do. Normally, a transaction involving a physical product has a service attached to it. Similarly, many services can not be provided unless a commodity follows with it. Services have several common features, but most often, the common characteristics are excessively emphasised. Normally, most services are characterised by being immaterial, inseparable, hard to standardise, and non-durable. Yet, these "common" characteristics are not common for all services.

- The *immaterial nature* of services follows directly from the fact that services are activities.
- Many services are *non-storable* and *non-durable*. When an aircraft departs, it is too late to sell out more of your capacity. For airliners, hotels, ski resorts and concert organisers, profitability is highly sensitive to the rate of capacity u utilisation. Thus, innovation among such service providers is

often directed towards increasing flexibility in capacity or levelling out fluctuations in demand. However, many services are more durable as the output or value of a service is more easy to store over time.

- In a large proportion of services provided in the economy, production and consumption have to be conducted *simultaneously*. In that case we say that the service is *inseparable*. This characteristic is especially relevant in the cases where the service is performed on the consumer him self, like hear-dressing, education, and restaurant services. Electronically based services like e-trade, financial services and telecom are on the other hand highly separable.
- The vast *heterogeneity* of services is driven by the limited ability to standardize services, service production processes and distribution. For instance, in business consulting where close customer contact is fundamental, it is hard to obtain routines that allow for mass production. In other services, standardization is simpler. Internet services, telecom services and insurance services are typically sold to large markets based on standards.

Services are what services do: A new typology

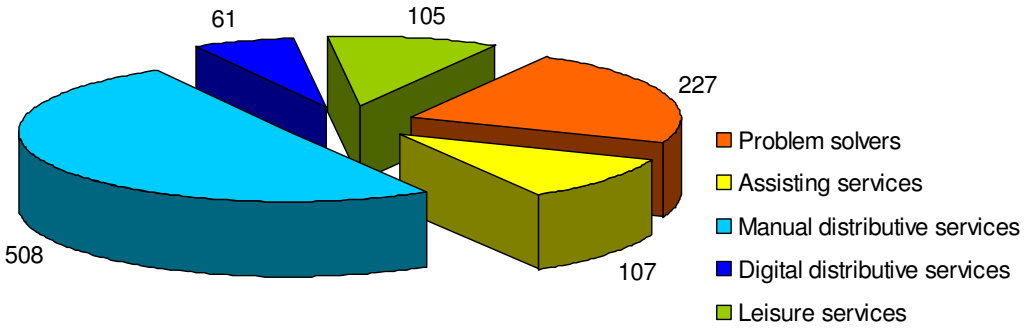
The logics of value creation in the service sector are linked to how different service producers create customer value. Keeping this in mind, we generate a simple typology based on services that display a large degree of similarity along the dimensions/characteristics listed above. Such a typology is helpful in understanding why and how firms innovate and how policy affects the innovative activity of firms. Our typology is based on the nace 5 digit nomenclature. Thus it is fully compatible with the existing industrial statistics. For more on which nace sectors that fit into each group, please contact the authors.

The typology contains the following service groups:

- **Problem solvers** create value by solving specific and unique problems for their customers. There is a low degree of standardization among these services. To a large degree such suppliers provide services that the clients are not able to produce themselves. Law firms, medical doctors, engineers, architects, and researchers represent typical examples of problem solvers.
- Producers of **assisting services** generate customer value by taking over time consuming activities for firms and households that are easy to standardize. Security services and cleaning services are typical examples of such activities.
- Producers of **distributive services** generate value through the facilitation of interaction between customers, for instance by selling goods and transporting commodities, passengers and information. A large sub-group of distributive service providers operate predominantly through digital channels, like providers of telecom services and financial services. Due to the large scale and productivity effects of operating in such channels, we split the distributive service providers into ***digital*** and ***manual*** distributive service providers.
- Producers of **leisure services** generate values by stimulating the emotions, perceptions and spiritual experience of customers. Leisure services are

highly heterogeneous and represent activities like sports, arts, entertainment, restaurant services and media services.

Figure 3.1 Employment in the service groups, 2004



A comparison of the size of these five service groups in Norway shows that *manual distributive services* is the largest, employing approximately half a million workers in 2004, see Figure 7. Problem solvers represent the second largest group, employing approximately 220.000. Growth wise, the problem solvers have more than doubled the number of employees since 1980. Producers of assisting services and leisure services have also experienced strong growth; however the growth rates are slightly lower.

Producers of distributive services, on the other hand, have faced decreasing or stagnating employment. Yet, due to large productivity growth, the climb in value added has been pronounced. There is good reason to claim that the remarkable productivity growth among these producers has strongly contributed to bring the Norwegian economy into a more efficient state, and the absolutely highest productivity growth is found among the digital distributive service providers.

The differences between the five service groups can also be illustrated by firm size. Digital distributive service providers and assisting service producers are overrepresented among the largest firms. This is clearly due to the scale advantages driven by standardization. The presence of strong heterogeneity among problem solvers and leisure service suppliers curbs their scale advantages. Thus a smaller proportion of these firms become really large.

4 Innovation in Norwegian Services

Compared to other OECD countries, Norway spends relatively small resources on R&D. This is especially so if you measure R&D investment as share of GDP. According to OECD (2005), the low R&D investment level is primarily driven by low R&D activities in the manufacturing sectors. Norwegian service sector firms, on the other hand, are relatively R&D intensive, compared to similar firms in other OECD countries. Measured in terms of R&D investment as share of value added in the service sectors, only the other Nordic countries and the US show higher R&D intensities. In 2001, service sector R&D investment represented 0.6 per cent of GDP in Norway, while the figures for Sweden, Denmark and Finland were 1.1 per cent, 1.1 per cent and 0.7% respectively. The conception of Norway as an R&D lager in OECD-area is therefore not relevant when it comes to the service sector. Moreover, the skill intensity of Norwegian service sector firms is high. Only Finland reports a higher rate of employees with the highest education level in this sector. The skill intensity is especially high within the financial sector and the business service sectors.

The picture is, however, different if you focus on growth in Norwegian service sector R&D spending over time. Trough the nineties, growth in service sector R&D intensity was surprisingly low. Only a few recent member states with a transition economy report similar weak R&D growth figures. The weak figures for Norway are driven by slow growth in business service R&D and more generic R&D services.

Also, even though the R&D-intensity is still high and the educational level is among the top counties, the share of service sector firms that innovate is low. Only approximately 30 per cent of firms registered in the 2001 Community Innovation Survey (CIS-3) reported that they were innovators. In comparison, the figures for Germany and Sweden were 57 per cent and 46 per cent respectively.[2]

In OECD (2005), it is reported that the share of new firms among the innovators is high in Norway (approximately 12%). This may indicate that there exists a well established culture for entrepreneurship in Norwegian service sectors that contributes to innovation.

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[2] Norway is one of very few countries that conduct the CIS as a compulsory survey. Consequently, the percentage of firms that do not respond is low. This may contribute to a larger proportion of firms in the survey that reports no innovation since these firms are inclined to drop out in the voluntary CIS of e.g. Sweden and Germany.

Slightly less than 20 per cent of all service sector firms covered by the Norwegian CIS-3 reported that they had received R&D-support through public funds, which is a slightly smaller figure than what you find in the manufacturing sector. As compared to other OECD-countries the share of firms that gain support form the government is not significantly different in Norway. Thus there is no reason to claim that Norwegian R&D policy towards this sector of the economy deviates substantially from the policy of other relevant countries.

Innovation in services: A way to overcome market imperfections

Most producers of services have a pronounced incentive to overcome market related obstacles to trade which are especially relevant for the service markets. One way to overcome these market imperfections is to innovate. Yet, producers of services differ in many respects. Consequently, their commercial challenges and innovative strategies also vary substantially from sector to sector.

The search for a unique and highly demanded service is the main driver for innovation among service suppliers. More specifically, service firms cluster into two groups with distinctly different innovation strategies: 1) When services are neither separable nor possible to standardize, there exists a fundamental problem of information asymmetry. Customers will not be able to evaluate the quality of a potential supplier up front as well as ex post, since alternative solutions are hard to compare. This problem contributes to narrow the markets by cutting demand. Innovation among firms in this group will tend to focus on building reputation through e.g. total customer solutions that reduces the risk for clients. 2) When services are characterized by a stronger degree of separability and standardization, innovations are more geared towards process improvements. The innovation strategy among such firms will often focus on industrializing the services in order to gain from scale effects. A closer look at our service typology reveals a highly differentiated pattern of innovation among the 5 groups:

For the **problem solvers**, innovation is often the core activity. This is due to the strong focus on customer adaptation and tailor made solutions. Innovation surveys also indicate that problem solvers invest a relatively large share of their innovative activity on product innovations as opposed to process innovations. They focus on new solution, new diagnostic tools, analytical concepts and differentiating brands. We also find a stronger presence of organizational innovations in this group, where firms to a larger extent are concerned with skill development and optimal incentive schemes.

Firms that produce **assisting services** will aim their innovations towards process improvements. Such services have a lot in common with traditional commodity production, but have to a lesser extent been able to improve their processes through digitalization and industrial processing. To a larger extent, process innovations in this group are linked to improved worker efficiency through standardization, quality control and scale effects.

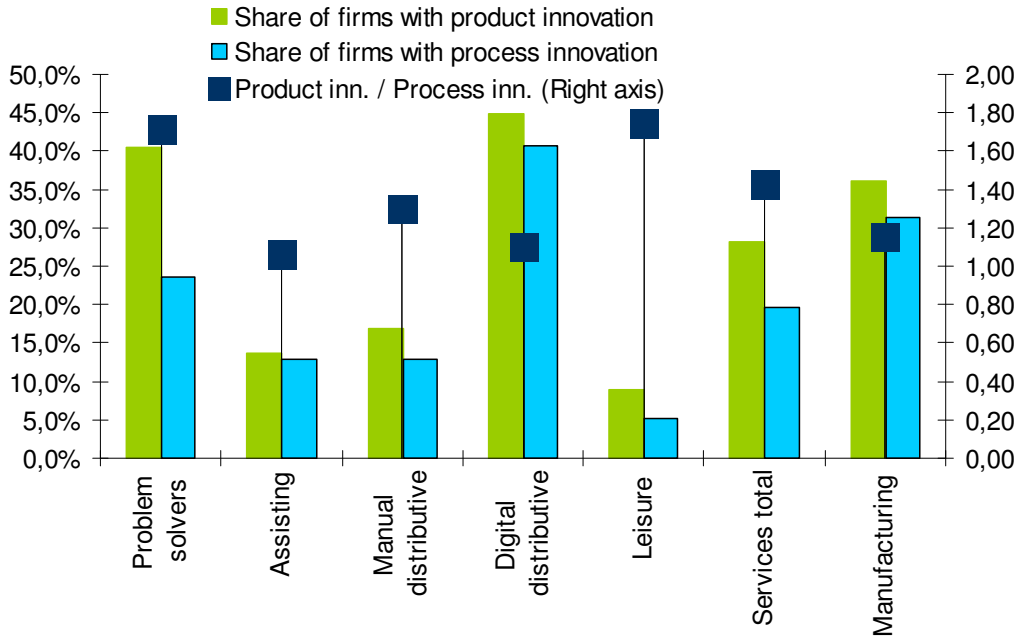
Innovation among providers of **distributive services** is to a larger extent a question of how to reduce transaction costs between customers. This can be obtained through process innovations as well as new forms of distributive services, both in terms of new ways of distributing and in terms of what is distributed. Process innovations are often linked to digitalization and automation,

and is often focusing on a more efficient user producer interface. Integration of logistic systems is a typical example of important process innovations among transporters. When distributive services are attached with network externalities (the value of a service increases with the number using it), customer segmentation represents an important form of organizational innovation.

While consumers normally prefer that services are predictable and of a stable quality, they are actually often searching for the opposite when they consume **leisure services**. The aspect of surprise is what many producers of leisure services search for when they invest in innovation. New experiences (product innovations) are thus the most important form of innovation in this group. Leisure service providers are now increasingly focusing on the use and development of new technology, both in order to improve products and in order to reach out to a larger group of customers. New technology enables such firm to multiply their services, improve their storage capacity and simplify distribution. This is particularly relevant for providers of art, entertainment and sports services. Tourism services also tend to focus on organizational innovations that link several providers together in a network. This is due to the strong complementarity between leisure services and tourism services, which generates large challenges relating to how you coordinate tourism related services.

There is reason to believe that innovations and innovation processes differ between manufacturing and service firms, but more interestingly, they also vary substantially between the five service groups defined in our service typology. Figure 4.1 shows the propensity to conduct product and process innovations among the five service groups in the Norwegian economy. The green bars show that share of the firms with product innovations, while blue bars illustrates the share of firms with process innovations, and finally the dark blue dots show product innovations divided by process innovations. The figure confirms our discussion above. Among problem solvers and leisure service providers, product innovations dominate, while the opposite is true for producers of assisting services. The highest shares of innovations are, however, found in digital mediation. This explains the rapid productivity growth in this sector.

Figure 4.1 *Share of firms with product and process innovation specified for the five service groups and manufacturing*



Source: Statistics Norway, CIS3 and own calculations

According to a new survey conducted by ECON Analyse, firms that face problems of asymmetric information in their markets, organize their activities to ensure that they frequently can launch new services. On the other hand, firms that focus on standardization tend to be organized in a more hierarchical structure which is in line with a more efficient production process. The organization of such firms is to a larger extent similar to the organization in most manufacturing firms. These findings are well in line with our description of what form of innovations you find in the five service groups.

We have conducted an empirical analysis of the innovative activities of firms, using the Community Innovation Survey (CIS3). The analysis shows that there are large differences between the five groups when it comes to innovation. On the aggregate level, service firm invest less in innovation as compared to manufacturing firms. However, this result must be handled with due care, since the differences between our service groups are large. For instance, the share of firms that innovate among problem solvers and digital distributive service producers is larger than the share of innovating manufacturing firms. On the other hand, the share of innovating firms sorting under assisting services and manual distributive services is significantly smaller. Leisure service providers are not often innovators, yet if they innovate, they spend relatively large resources on this activity.

The deviating patterns of innovative activities among service sector firms is not necessarily only driven by the way they contribute to value for their customers. Political regulations and the competitive pressure can also shape the incentives to innovate. As both policy and the competitive configuration of a market changes over time, so will the innovative activity. One example of such change can be found among retail traders during the eighties and nineties. The introduction of chain stores like REMA and RIMI reconfigured the sector in a dramatic way, driving up innovation and productivity.

5 Norwegian Service Innovators: Some relevant cases

To illustrate how producers of services innovate in practice, bearing in mind our typology of services, we have carried out several case-studies of successful services companies. The aim is partly to illustrate successful innovations and performance in the service industries at company level. The cases also help us to analyze in depth; how companies innovate, the sources of innovations, how different innovations interact and drivers and barriers to innovation. The companies represent all our service groups, i.e. problem solving, assisting services, distributive services and leisure services.

Table 5.1 The cases placed in a service group / innovation type matrix

Innovation category / Service category	New service	Improved process	New organisational solution
Problem solving	emgs	Feiringklinikken	Akvaplan niva
Assistance		R&V Rengjøring & Vedlikehold as	
Distribution – digital	PLANETNOISE VERSION 2.1	TELIO	
Distribution – manual		CargoNet	
Leisures	Deli de Luca, FUN COM	fabelaktiv	SKISTAR

The company **EMGS (Electromagnetic Geoservices)** has developed a **new method mapping deposits of oil** and gas below the ocean floor, based on already known electromagnetic technology (Sea Bed Logging). EMGS' Sea Bed Logging technology make search for oil substantially more simple. Some will regard the new method as a technological innovation, but it is surely a service innovation. EMGS deliver no goods, but carry out mapping services for oil and gas companies. The market is global and the growth potential is huge.

EMGS was originally part of the state owned oil company Statoil, which had enough financial muscles to bring the idea to commercialization. Statoil realized however that electromagnetic mapping was not core business and sold the firm to an American private equity company (Warburg Pincus). Statoil's early ownership illustrates the importance of sufficient powerful instruments able to nurse new ideas until they are able to stand on their own feet. At the same time it illustrates the need for dedicated ownership when the market battle starts.

Akvaplan-niva AS is both a **consultant and a research centre** within aqua-culture and marine consulting. Akvaplan-niva carries out classical problem solving services. The company manage to unite "management consulting" and research in a successful way. This kind of business is rare in Norway and has revealed considerable synergy effects. We regard this mix of activities as an important organisational innovation.

Akvaplan-niva work closely with different public institutions and are partly financed through public research projects. The knowledge generated through these projects make the company more knowledge-competitive, which benefit their consulting activities.

Feiringklinikken is a hospital specialized on hart diseases. The clinic is owned by the ideal organisation The Norwegian Association of Heart and Lung Patients (LHL) and was established in 1989. The start-up was mainly a result of discontent with the operation capacity in public hospitals at that time. During the years Feiringklinikken has made considerable improvements within hart surgery, both regarding quality and effectiveness.

From day one the clinic considered attractive locations for convalescence, attractive working conditions and treatment specialization as a tool to better treatment. This combination of process and organisational innovation has caused private competition to a highly regulated sector and enhanced effectiveness in public hospitals. Because of the public financing of the health sector in Norway, Feiringklinikken are highly dependent on the development in the financing system.

Rengjøring & Vedlikehold AS is among the five largest cleaning service companies in Norway. The cleaning market is a growing market with fierce competition. Rengjøring & Vedlikehold market themselves as a quality cleaner with high focus on documented quality routines and well organized and healthy working conditions. Their innovations have mainly been process orientated – continual effort to enhance the quality, train the work force and certify their competence and processes. Until recently the willingness to pay extra for documented quality has been low, but this seems now slowly about to change. Higher focus on benefits from good indoor climate is the main reason, which gives competitive advantages to contractors as Rengjøring & Vedlikehold.

The focus on quality cleaning may be lower in the public sector than in the private sector, which has made Rengjøring & Vedlikehold reluctant to work for public enterprises. Positive productivity gains may then be lost for the society.

Planet Noise is a small record company who have developed a way of **distribute music totally independent of election of playback unit** (CD, MP3, mobiles or

future medium). When the music is bought (CD or via internet), you may play it on the medium you want free of extra charge The innovation can be seen as a solution on the ongoing dispute on how to unite the interest of music customers and artists. Because of the intangible nature of Planet Noise invention, it has been difficult to patent. Protection of their intellectual property rights is a main concern for the company.

CargoNet is a railroad carrier of goods between the Norway's largest goods stations. Through a innovative combination of standardised Trough their effective delivery services, CargoNet has revitalised the railroad as a route of transportation.

Deli de Luca is a crossing between a convenience store and a café. Their key innovation is a business concept focused on convenience food of high quality combined with a delicate and urban atmosphere, both in menu and location. Their marketing appeal to experience and zest. Continuous introduction of new products is part of the concept. Deli de Luca is an example of a market driven innovation without any help of any policy-action, except the general acceptance of new convenience stores in competition with existing ones.

SkiStar owns and operates ski facilities in Sweden and Norway. SkiStar has in a innovative way developed an organisational concept, where SkiStar own ski based activities and coordinate complementary essential parts of a consistent ski experience, as hotels, restaurants and transport. By producing common goods as marketing, competence and logistics, which are all essential for successful tourism business, SkiStar has enhanced competitiveness of local tourist industry. . Tourist policy is challenged both through a new competition picture and by showing and alternative to public production of common goods.

Other innovating companies covered in the Norwegian report:

Telio: Internet based phone company

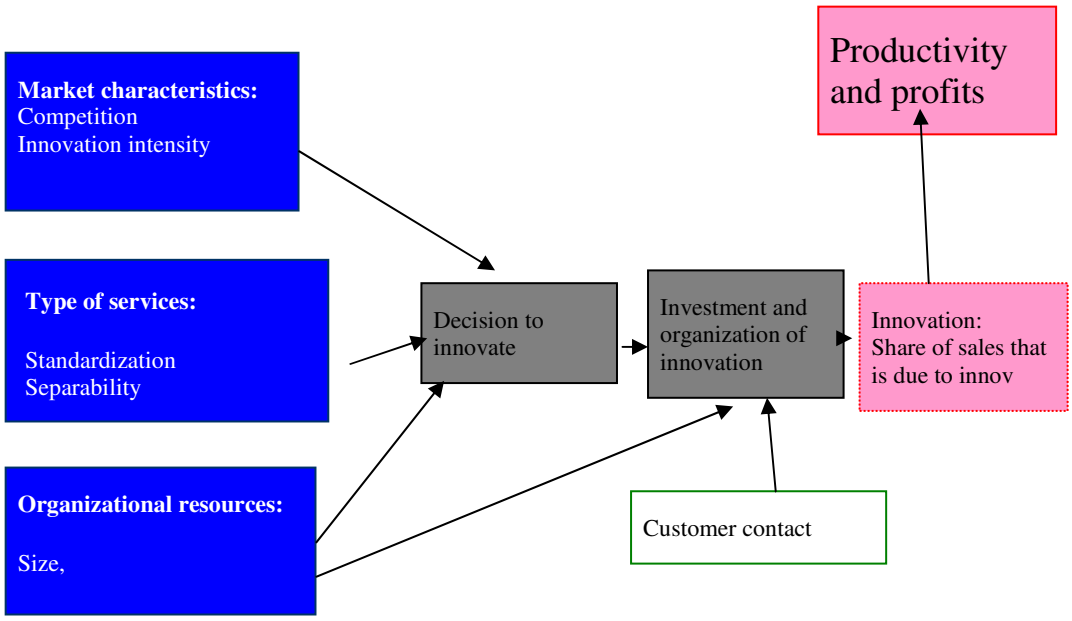
Fabelaktiv: Television production company focusing on programs for children

Funcom: Large international provider of computer games.

6 Five indicators of innovation in services

In order to monitor how the innovation activity in the service sector develops over time, access to information on central patterns of innovative activity is of vital importance. An appropriate set of innovation indicators will help the planner in choosing the right measures to promote innovation. We have developed five indicators that utilize available statistics to map the most important features of innovation among service producers based on the following simplified model of innovation where the purpose of the indicators can be identified:

Figure 6.1 A simple model of the innovation process



The factors identified in the blue boxes cover the firm's internal and external environment for innovative activities. Indicators that relate to the environmental factors are called ***environmental indicators***. The grey boxes cover the part of the innovation process describing the innovation inputs, like R&D investment, training programs, R&D cooperation etc. The indicators covering this part of the innovation process is called ***input indicators***. The red boxes describe the output side of the innovation process. They describe the amount and type of innovations and the effect on firm productivity and profitability. Indicators that relate to this part of the process are called ***output indicators***.

The indicators should be produced for each of our five service categories, but it is fully possible to provide indicators on a significantly more detailed aggregation level (five digit nace-level). We suggest the following five indicators as proper means to follow the development of innovative success in the Norwegian service sectors.

1) **The share of firms that invest in innovation activities (input indicator).** The ability to produce innovations is utterly dependent on the firms willingness to invest in innovative activities. There is a strong positive correlation between the share of firms in a market or an industry that invests in innovation and the share of firms that actually innovate. The indicator should be based on statistics from the CIS which is provided every fourth year.

2) **Total innovation expenditure measured in NOK (input indicator).** The amount of innovation investments or the size of the involvement is of vital importance for whether a firm obtains an innovation or not. It is also important with respect to whether the innovation will provide higher productivity and profitability. The indicator should be based on available statistics, either from the CIS or from the bi-annual R&D statistics provided by Statistics Norway.

3) **The share of new services in total turnover (output indicator).** This indicator is closest to what most policy makers are concerned about. It is a clear advantage that this indicator also explicitly focuses on the commercial aspects of the innovative activity.

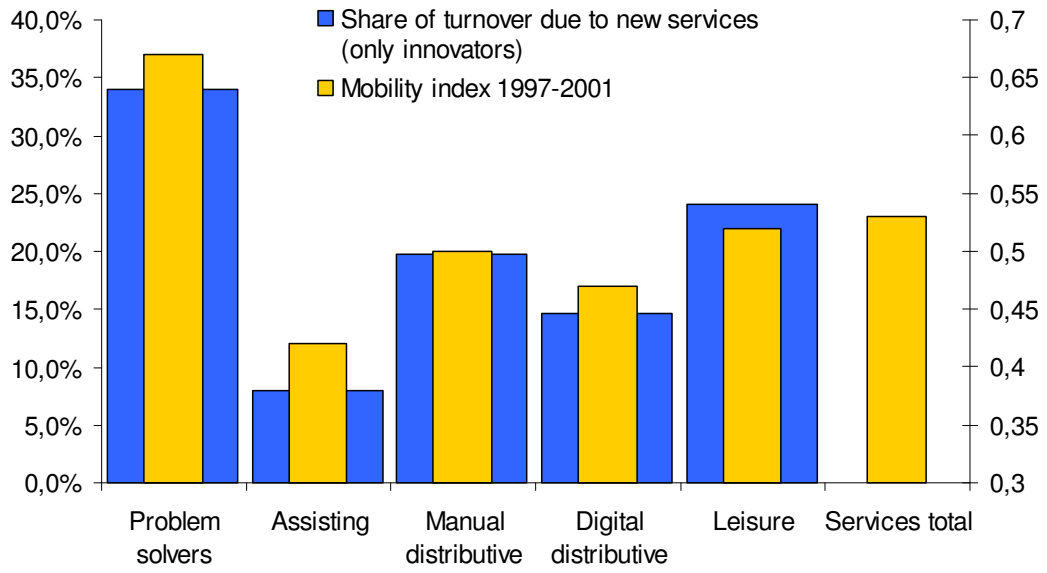
4) **Mobility indicator (environment and output indicator).** The degree of mobility within a specific market, measured in terms of changes in market shares between firms that compete in the same market, taking explicitly into account the entry and exit of firms, is strongly correlated to the amount of new services in total turnover, see Figure 10.

   The mobility index is given by:

$$M_K = \frac{\sum_{i \in K} \left| m_{i,t} - m_{i,t-s} \right|}{2}$$

where M_K is the mobility index for industry K, and $m_{i,t}$ is firm i's market share at time t. Thus the mobility indicator is a good output indicator. But it also says something about the pressure for innovation in a market, which is captured by the environmental factors in the model. The fact that this indicator can be provided on a yearly basis is a clear advantage.

Figure 10. Sales of new services and the mobility index



Source: Statistics Norway, CIS3, the MENON firm database and own calculations

5) **Growth in value added per employee (output indicator).** Productivity growth is one of the most important measures of how innovation contributes to economic wealth in the long run. Thus, this indicator is a highly important output indicator. However, the indicator is attached with a significant potential for measurement error, since some groups of services register high productivity growth (process innovators) while others contribute to economic welfare through large consumer surplus (product innovators). An optimal design of this indicator requires the implementation of a well suited quality adjustment measure. Politikk for idégenerering og kommersialisering.

7 Policy for service innovation and commercialization

Although services represent most of the economic activity in Norway, it is not evident that one should design a specific innovation policy directed towards services. The present innovation policy is not designed to take care of specific sectors, but rather to increase the overall innovative activity in the economy. If the policy is to be relevant for service innovators, it must depart form the insight that services are activities and not commodities.

Due to the dominating role of private services, policy measures that simplify and improve the innovation process in this sector will have a large impact on national productivity growth. Recent innovation driven productivity improvements within telecom, financial services, transport and retail trade serve as good examples in this respect. The improvements are not a result of political initiatives. Rather, the willingness to not interfere in the evolution of these industries has opened up for fast changes.

A low degree of government interference does not come for free, since organizational changes in e.g. large infrastructure companies (like banks, postal services, railway companies and road construction) often bring significant adjustment costs to the society. In the turmoil generated by these adjustment processes, it is important to bring forward the large economic gains due to such innovations. The awareness of the positive aspects of such innovations in the service sector is also important since new services often appear as controversial, and not in line with the traditional view of innovation. Remember that even new – but often provoking – concepts of entertainment, or new ways of organizing tourism is still innovation.

To increase the awareness of the role of innovation in services, we suggest that the annual national budget devotes a larger part to the structural developments in the service sector. For analytical purposes, we suggest that the Ministry of Finance in their work with this publication adopts our service typology and indicators developed in this report.

Measures sorting under the umbrella ”industrial policy” are highly relevant for a large pool of service sector firms. However, the relevance is dependent on where in the innovation process the measure is targeted.

- **Support to the generation of ideas** is of vital importance for knowledge intensive service producers. The government holds a large set of measures that may help to solve several forms of market imperfections that suppress

the formation of new ideas in the service sector. In our opinion, it is especially important to invest more in the measures that are focused on stimulating the market for venture capital and rights based R&D support like SkatteFUNN. We recommend that the government spend more resources on providing public information on how service innovators can protect their innovations through alternative systems for copyright protection. In an international context, one should also develop efficient information channels that provide innovators with necessary information on the IPR-system in other countries, specifically relating to service producers. We also recommend that the government starts to evaluate alternative measures to promote the cooperation between academic institutions and service producers in the form of academic R&D contracts (AFU).

Even more important is government support that contributes to simplify the commercial phase of the service innovations. We point out five areas that are central to the service innovators ability commercialize new services. Areas where the government can play an important role:

- **Improve the market for vital inputs**. Knowledge and competencies represent important strategic factors in all service sectors and especially so for problem solvers. In highly specialized markets where problem solvers operate, the lack of relevant skilled labour often represents an important bottleneck which is detrimental to innovation. A strategy for more targeted and relevant education and more efficient transport systems in the more densely populated areas stand out as the most productive policy measures in order to improve the access to relevant skills for service sector firms.
- **Bring the innovator closer to the market.** Innovation driven by interaction between agents in the market is in principle not subject to the influence of government policy. Still, the government may have a role to play here too. Due to often large information asymmetries between producers and consumers in service markets, the government may play an important role as a market facilitator by developing and implementing quality standards that reduce the risk for consumers. These measures are particularly relevant in markets for non-digital services, where the service must be consumed before the quality can be evaluated. The government plays such a role on several arenas today, e.g. in the area of cultural services and in international trade policy. Furthermore, the government plays a role as a coordinator in the tourism industry through its tourism policy.
- **Make it simpler for market participants to coordinate.** Firms that supply services where the consumer value of the service is affected by the supply of other services, will normally have an interest in coordinating activities in order to improve demand. You find clear examples in the markets for tourism (coordinated development of destinations) and in transport. Common measures require coordination of financing and devotion of resources. The government can play an important role in solving possible coordination failures.
- **Innovation friendly regulations.** Many of the larger service sectors are subject to extensive regulations. This is particularly evident in the markets for financial services, telecom, postal services, media and transport. The regulations are partly motivated by economic efficiency considerations and partly by alternative social objectives. Moreover, several service industries

are also directly affected by the agricultural policy as well as other industry specific regulations. The effect of such regulations on incentives to innovate should be thoroughly considered when forming a innovation policy for the service sector.

- **Support the development of new markets for private services.** In Norway, the public sector plays an important role as a producer and supplier of a large variety of services in areas where the economic arguments supporting only public provision are relatively weak. A policy that allows a more pronounced presence of private service suppliers in these sectors (e.g. cultural services, health services, and transport) will allow a wider variety of services driven by more extensive innovation both among existing and new service providers (public as well as private). The demarcation of where you allow private service providers, directly defines the policy towards innovation in services.

In Table 7.1 we give a brief overview of the relevance of our policy measures specified for each of our five service groups.

Table 7.1 *Policy areas of importance to services*

	Generation of ideas	Commercialization				
	Support the generation of ideas	Improve markets for vital inputs	Bring the innovator closer to the market	Simplify market coordination	Innovation-promoting regulations	Support market development
Problem solvers	High relevance	High relevance	High relevance	Relevant	Relevant	Relevant
Assisting services	Low relevance	Low relevance	Low relevance	Low relevance	Low relevance	High relevance
Manual distributive	Low relevance	Low relevance	Relevant	High relevance	High relevance	Low relevance
Digital distributive	Relevant	Relevant	Relevant	High relevance	High relevance	Low relevance
Leisure services	Relevant	Relevant	High relevance	High relevance	High relevance	Relevant

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