

STEP report

ISSN 0804-8185

R-01

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1999

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Economic activity and the knowledge infrastructure in the Oslo region

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Report prepared for the RITTS Oslo Project

Oslo, April 1999

STEP
group 

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Preface

This report has been written for the RITTS Oslo Project. We would like to thank *Næringslivssekretariatet for Oslo og Akershus* and project leader Knut Halvorsen for the opportunity to engage in research within the framework of the RITTS Oslo Project.

The report has been produced in a very limited period of time. It summarises available data and literature on the innovation system in the Oslo Region, and is intended to be a foundation for further research in this important field.

Oslo, April 30, 1999

Keith Smith

Abstract

This report is an overview of existing information on the Oslo region, drawn up as part of the Oslo region RITTS project. The objective of this part of the project is to collect, summarise and interpret existing information relevant to production, innovation and technology transfer in the Oslo region.

The material covered is of three kinds:

1. Firstly, the project overviews and discusses existing literature in the form of reports, articles, and books which cover aspects of regional innovation, regional industrial policy and industry performance in the Oslo region.
2. Secondly, the project collects and summarises relevant industrial statistics on output, employment and industrial structure for the region.
3. Thirdly, the project describes the basic elements of the supply infrastructure in the areas of technology creation and transfer in the Oslo region.

In addition, the report does two other things:

- ◆ It provides an overview of relevant data sources and databases for empirical information on the Oslo region
- ◆ It incorporates an annotated bibliography in Norwegian and English on Oslo region

In terms of studies of the Oslo region, the literature is large. There are a significant number of studies of important industrial clusters, mainly written within the framework pioneered by Michael Porter. These include studies of the food industry, health-related (pharmaceutical and medical equipment) industry, the printing and other media-related industry, energy-related technological industry, shipping and maritime industry, the IT-industry and retailing. For all these sectors, performance conditions were evaluated, and concrete proposals were made for policy action which could improve the prospects of growth and competitiveness in the industries. An important argument emerging from these studies is that Oslo is the most important Norwegian region in terms of the creation of new companies in new sectors. Oslo and Akershus have the highest shares of employment of IT-qualified staff among the regions of Norway.

The second part of the report deals with economic activity in the Oslo region. A first important trend is a long term shift in industrial structure, with sustained growth in service sector activities; these now make up more than 80% of economic activity in the region. The most important service activities are retail trade, transport, and the residual category 'other services'. In manufacturing, there are two main clusters of activity, in the food sector and in printing and publishing. There are smaller but

significant activities in chemicals and in electrical and optical engineering. However the main growth sector, in terms of share of output, is printing and publishing, which now has over 40% of all industrial employment.

Oslo support a major 'knowledge infrastructure' in the form of research institutes, universities, science parks and consulting firms. We estimate approximately 75 non-university research institutes in all fields, 3 science parks, and 20 higher education institutions with approximately 60,000 students. The technological and R&D capabilities of the research institute sector cover the whole range of relevant technologies for the region's production structure. Oslo Research Park currently has 49 firms, of which 60% are in the fields of IT and media, with the remainder spread between biotechnology, materials, pharmaceuticals and consultancy. The science park at Kjeller has major capabilities in energy and environmental technologies, aerospace, telecommunications and IT (especially satellite communications) and industrial mathematics applications. The science park at Ås has specialisation in agriculture, aquaculture, environmental sciences, forestry and food sciences. Finally the region has a wide range of venture capital institutions, consultancies and technology transfer institutions.

Keywords: Akershus, clusters, industry, industrial structure, innovation, innovation system, knowledge infrastructure, Oslo, Oslo-region, R&D, regional development, regional policy.

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Part 1: Literature Survey

By Finn Ørstavik

Introduction

The objective of this section is to present and characterise the existing literature concerned with production, innovation and technology transfer in the Oslo region¹. Reports, articles and books dealing with industry performance, innovation and regional industry policy will be summarised and interpreted, and a comprehensive overview of how researchers have approached problems and analysis of the region will be offered.

We have developed a bibliography (appended as an appendix to this report) through a search in public library databases over books, articles and research publications, and through a screening of references made in the publications thus gathered.

A very condensed listing of this bibliography is found at the end of this chapter. In the Appendix, we have put a more comprehensive presentation of the existing literature, where more detailed information about the volumes are presented together with a very brief characterisation of the content.

The bibliography contains diverse types of documents: Some are theses from university or college graduates (such as the University of Oslo and the Norwegian School of Management), some are reports from public sector institutions (such as the Municipal Office of Planning and Building in Oslo), some are reports made for Government (such as the NOU-series), while others are reports from research institutions (such as NIBR², STEP and the FAFO institute of applied social research).

With respect to the attention paid to the Oslo-region, we can distinguish three main types of documents:

- ◆ Those that specifically address industry and industrial development in the Oslo region.
- ◆ Contributions that are concerned primarily with many regions or with the country as a whole, but which pay attention to the Oslo region as part of what is being analysed, and where the situation in this specific region is analysed comparatively and contextually. (Some reports, for example, are concerned with the role of the Oslo region in the national division of labour.)

¹ The Oslo region is here understood as covering the two counties Oslo and Akershus.

² Norsk Institutt for by- og regionforskning.

- ◆ Documents that mainly are concerned with theoretical issues, but that use empirical material, illustrations or examples from the Oslo region.

The general literature which is dealing with regional economic development, but which is not concerned with the Oslo region specifically, is not covered in this bibliography.³

The bibliography contents – a brief characterisation

The RITTS Oslo bibliography was compiled in a small database which made it easier to get an overview of the contents of the literature dealing with industry performance, innovation and regional industry policy in the Oslo Region. The presentation of the bibliography – both in the condensed and the more comprehensive version – is organised chronologically (with the most recent items first), and then alphabetically after *Institution* and *Author*. Each volume has been assigned its unique identity number (Id.), and in this presentation, this identification will be used as a short-hand reference.

Distribution by years and institutions

There are only a few institutions that have engaged seriously in the publication of literature concerning industry performance, innovation and regional industry policy in the Oslo region. Table 1 (below) reveals this. One institution which has done so, and which has done so consistently since the late 1960s, is the Municipality of Oslo. The other important institution is NIBR, but this institution has – with one exception – published exclusively during the nineties.

The general pattern is that most of the publications that we are interested in have been published during the last few years. The very first publication we have found stems from 1942, but only 24 publications in the database has been published before 1980. 22 publications appeared during the 1980s, but during the period 1990-1998 as many as 68 publications have been produced.⁴

³ Among these are, for example: i) Bukve, Oddbjørn 1994: Lokal utviklingspolitikk. Oslo: Det Norske Samlaget, ii) Isaksen, Arne (red.) 1997: Innovasjoner, næringsutvikling og regionalpolitikk. Kristiansand: Høgskoleforlaget, iii) Johannisson, B. and Spilling, O. 1985: Lokal næringsutvikling. Oslo: Universitetsforlaget and iv) A number of reports and working papers from the STEP group.

⁴ The number may actually be higher, as there is a certain delay in the updating of the library databases used in this research, and more publications may become available than those we have been able to trace.

Table 1: Publications by year and originating institution (Source: The RITTS Oslo Bibliography database / STEP)

<i>Institution</i>	1942-69	1970-79	1980-89	1990-98	<i>Sum</i>
Oslo Kommune	2	5	5	6	18
Government institutions	0	0	2	4	6
Consultants	0	2	0	3	5
NIBR	1	0	0	22	23
Other research institutes	0	0	4	9	13
BI	0	0	1	8	9
University of Oslo	1	1	3	3	8
Other institutions in higher education	1	1	4	3	9
Other	2	4	1	7	14
Unknown	1	1	2	3	7
Total	8	14	22	68	112

Distribution by theme

When we look into the content of what has actually been produced, we can single out a few central themes around which publications can be grouped. To a significant extent, the thematic grouping overlaps with the grouping according to originating institution, but there is also a clear trend of thematic development over time. In the period before 1990, most of the – sparse – literature fall into one of two groups:

- ◆ Publications from the planning and construction office of *Oslo Kommune* (*Byplankontoret*) which deals with issues such city planning, the functional utilisation of land (leisure, industry, residential, etc.), the historical development of the city centre, etc. (Among these items in the database are publications 70, 84, 90, 92, 99, 104, 107, 109-112).⁵
- ◆ Publications – mainly from the same office – analysing the industrial structure in Oslo, in the light of continued de-industrialisation: Many firms, and especially production plants, were moved out of Oslo during the seventies, and many items in this list reflect that there was a strong interest in knowing why, and what could be done to reverse the trend. (Documents 69, 71, 73, 74, 76, 78-81, 83, 86, 87, 93, 96-98, 100-103, 105 and 108 fall into this group.)

In the period from 1990, which is the largest part of the literature, and the one with the greatest relevance for the RITTS Oslo project, the publications fall into the following main thematic groups:⁶

⁵ The numbers refer to the “Id.”-number of the items in the bibliography, confer the listing at the end of this chapter.

⁶ The borders between thematic groups are obviously blurred in some cases, and the placement of specific items will in some cases be debatable. Also, we have in some cases found it appropriate to mention specific documents under different thematic groups.

- ◆ Documents concerning **structure and growth patterns in industry in general** in the Oslo-region. (Items 1, 10, 24, 38, 42, 43, 51, and 64.)
- ◆ Reports concerning the **structure and prospects of the information- and communication technology industry and other specific industries**. (Items 12, 23, 25, 46, and 49.)
- ◆ Analyses of **specific localisation issues**, such as the location of the new Oslo Airport (items 61 and 66) and the significance of *Oslo Havn* and effects of moving this major commercial harbour out of Oslo (items 6, 9, 11, 13 and 26).
- ◆ Studies concerned with specific **development problems in the east part of the centre** (*Indre Øst*) of Oslo. (Items 20 and 35.)
- ◆ **Cluster- and policy oriented studies focusing on industrial structure and on the characteristics of a future-oriented and powerful industry- and business development policy**. NIBR has played a key role in authoring this large body of research, and has collaborated with Oslo Kommune in the process. (Items 15-19, 25, 27-34, 36, 56-59 fall into this group.)
- ◆ Studies concerned with **the functional role of Oslo-region as a centre of innovation and advanced production in the overall national context**. During the 1990s a literature has been emerging which focuses on the specific role played by the Oslo region in the overall innovation and production system, as one region among many mutually dependent and interacting regions. (Among the relevant items here are 3, 5, 6, 14, 28, 34, 38, 52-55, 62 and 68.)
- ◆ Documents concerned with the issue of **policy formulation and policy learning**, specifically how to develop the policy making and policy implementation capacities of *Oslo Kommune* and *Byrådet* (the elected municipal government). (Among relevant items are 2, 41, 47, 48, 50 and 67.)

Analysis of specific contents

Considering the overall contents of the bibliography, we have chosen to concentrate our efforts on gathering and analysing literature published from 1990 and onwards. But not all the documents in groups 1 to 7 above have proven themselves to be of equal interest in the context of the RITTS Oslo project. In the following we wish to limit our discussion to the most interesting ones.⁷ As a special case, we have not at this point (in RITTS Oslo Module 3) analysed the documents which regards recent efforts to develop policy formulation, implementation and learning in Oslo.

⁷ The specific reasons for not going into detail about documents are many and diverse. Quality, relevance and dated empirical data are the most frequent reasons that a document has been characterised as “of limited interest”. In a few cases, we did not manage to get hold of documents in time, although we considered them potentially relevant.

Documents concerning structure and growth patterns in industry in general in the Oslo-region (items 1, 10, 24, 38, 42, 43, 51, 64 and 66).

The documents we have analysed in this thematic group are quite diverse.

Stortingsmelding 31, 1996-97 emphasises that the main objectives for regional policies, i.e. maintaining current population patterns and extensive support to peripheral areas, are unchanged. It mentions the complementary relationship between rural and urban areas; and the Oslo-region is included in statistics. However, the specific role and functions of cities are not properly analysed, and no specific actions or policies are targeted at this region.

The NIBR-report on regional development includes an analysis of population and employment for Eastern Norway, with historical trends and 3 scenarios for possible trends in the future. A statistical prediction model is used, and the authors conclude that in any of the analysed cases, the Oslo-region will grow strongly.

Industri i Oslo is a thesis submitted at the Norwegian School of Management (BI) in 1990. The thesis continues the – by then – well established tradition of questioning the reasons for industrial decline in Oslo. However, the authors choose a novel approach in pointing out that one important reason is simply that fewer new firms are established in Oslo than one should expect. As one potential causal factor for this, industry's ability to couple up with academic and institute research milieus and to utilise the competence and knowledge they generate is analysed and found to be poor.

The STEP-report *Struktur og dynamikk i kunnskapsbaserte næringer i Oslo* analyses the situation for and development trends within knowledge based industries in Oslo. An overview of development mechanisms is provided, and perspectives are drawn up for the potential policy role of Oslo Kommune in the future.

Reports concerning the specific structure and prospects of the information- and communication technology industry and other specific industries (items 12, 23, 25, 46, and 49).

The most important contributions in this group concern the IT-industry. The NIBR report by Fosmark and Johnstad (1995) and the thesis by Røgeberg (1996) are both following the scheme laid out by Porter, and are remarkably similar. Data from interviews are used together with limited statistical analysis of the branch structure. Both reports conclude that increased co-ordination of R&D institutions and increased business-research collaboration would be a positive contribution to further growth, and that this should be among the key objectives for policy makers.

Norsk IT-næring mot år 2001 is not specifically focusing on the Oslo region, but is highly relevant, since so much of this industry is located here. Although not referring directly to

Porter, the study is concerned with clustering and many of the other issues that are discussed in the former reports. The study also encompasses a survey and a relatively detailed analysis of the industry structure.

Analyses of specific localisation issues: The location of the new Oslo Airport (items 61 and 66).

Two reports from Næringsøkonomisk Institutt address industrial development and localisation preferences in the industry in the “Oslofjord region”. There is a rather detailed structural analysis of which industries are the most important in the region, interview data are gathered in order to investigate the relationship between access to major airport and localisation of firms. The objective is to show the potential significance of a new Oslo Airport. However, few substantial conclusions are drawn, beyond the obvious that export oriented firms appreciate being close to an airport.

Analyses of specific localisation issues: The significance of *Oslo Havn* and effects of moving this major commercial harbour out of Oslo (items 6, 9, 11, 13 and 26).

There is, as we have seen, a long tradition for analysis of, and planning for, the physical layout of Oslo. In recent years, successful transformation of industrial areas – the Aker Shipyard in the core of the Oslo seaside being the most important example – have led to increased political pressure to continue this process. In this connection, *Oslo Kommune* has begun working on plans to move whole or parts of the commercial harbour (*Oslo Havn*) away from its current location. The analytical work is summarised in the report *Fjordby eller havneby?* which was published by *Plan- og bygningsetaten* in 1997-98. The report considers effects both on daily life (recreation and living), on business (transport costs) and the environment (pollution and noise).

The interregional perspective which is developed in this report is echoed in another report, published by NIBR in 1995. Here, the authors develop a regional perspective on what they call the “Oslo-Gothenburg region”, and use this perspective to evaluate the consequences of different developments of transport infrastructure in between Norway, Sweden and the rest of Europe. 3 scenarios for future infrastructure development are considered.

Studies concerned with specific development problems in the east part of the inner centre of Oslo (items 19, 20 and 35).

Three reports address the situation for business and the trends in industrial developments in the *Oslo Indre Øst* - the eastern parts of the centre of Oslo. This is a traditionally working class area, which during the seventies and eighties experienced decline and

deteriorating living conditions. All the reports stem from graduate students at the Norges Markedshøyskole (currently a part of BI), and a project that was established there with *Oslo Kommune* as a sponsor. All reports on research applying qualitative methods. The reports portray a bleak situation where there is a lack of entrepreneurial spirit, weak networks and lack of communication, both among business firms and between business and municipal government. Business and population experience both a lack of attention from municipal authorities and a misfit between existing policies and real needs.

A related report by Andreassen and Øijord (50) should be mentioned here. This report is focussing on Oslo as a whole discusses the role of Oslo Kommune as a service provider for industry and business. The conclusion is that bureaucratic principles matches badly with the need to be specific in the response to needs, and there is widespread mistrust in business firms with respect to services offered by Oslo Kommune.

The reports may be of varying (academic) quality, but are problem oriented and have a clear empirical focus, which is useful and which should have the potentially contributed significantly to subsequent policy formulation in Oslo.

Cluster- and policy oriented studies focusing on industrial structure and on the characteristics of a future-oriented and powerful industry- and business development policy (items 15-18, 25, 27-34, 36, 56-59).

In 1990, Michael Porter published *The Competitive Advantage of Nations*, an ambitious attempt to explore the nature of national competitiveness across industries. Porter's book generated follow-up research in many countries. In Norway, researchers at NIBR embarked on a major study based on Porter's theory, in a project that was named "*Næringslivets utviklingspotensialer i Oslo-regionen*". This work came to result in the first coherent body of serious research dealing with industry performance, innovation and regional industry policy in the Oslo region.

By 'competitiveness' Porter means the ability to sustain exports or foreign direct investment; more generally he means a sustained presence within a high-income industry. His point of departure is twofold: on the one hand, competitive advantage does not result from 'natural' physical or economic conditions, but is constructed over time by investment in infrastructure and tangible and intangible capital. On the other hand, competitiveness reflects innovative diversity - the ability to upgrade products and processes across quite different products or services. Countries and regions have quite different patterns of specialisation, but within area of specialisation they tend to have 'clusters' of industry. Porter then focuses on the factors which sustain these clusters - factor conditions, home demand conditions, related and supporting industries, and firm strategies. This approach has led to a wide range of attempts to test his theory, mostly focusing on identifying clusters, and explaining their performance.

NIBR researchers developed studies on the food industry, health-related (pharmaceutical and medical equipment) industry, the printing and other media-related industry, energy-related technological industry, shipping and maritime industry, the IT-industry and retailing. For all these sectors, performance-conditions were evaluated, and concrete proposals were made for policy action which could improve the prospects of growth and competitiveness in the industries.

In the further analysis the authors emphasise that the linking of firms with related other firms, and with competence and knowledge producing institutions such as universities and research institutes, and finally to framework defining institution in local and general government are crucial for success. Policies are proposed that aim at strengthening such collaborative and innovation-generating relationships, and a proposal is made for establishing a new policy-making agency which could pursue effective, future oriented and R&D-based industrial policies.

Studies concerned with the functional role of Oslo-region as a hub and as a centre of innovation in the overall national context. (items 3, 4, 5, 14, 28, 34, 37, 38, 52-55, 62 and 68).

The final thematic group that we are able to deal with in this overview in do not make up a coherent set of reports in the way the NIBR reports do. With basis in an evolving set of evolutionary and systems-oriented set of theories about innovation and change, a literature has been emerging during the 1990s which focus on growth as the result of processes of interactive learning. In this literature, which in reality is closely connected to the cluster studies we discussed above, a few studies focus specifically on the role played by the Oslo region in the overall innovation and production system, and on the industries of this region. The STEP-report which analyses road transport is an example of this. However, most of the studies have the Oslo-region as one of several foci.

Several reports point out that Oslo is the place where new industries are born. That is; firms in completely new industries often have appeared first in Oslo. This has been shown empirically in several studies, which have been both statistical analyses of databases, and interview based (and historical) qualitative studies. Important parts of Norwegian industry originated in the Oslo area, and throughout the industrialised era, Oslo has continued to employ more people in new industries than other parts of the country.

The Oslo-region over half of all employees in the textile industries at the end of the 19th century, 35% of the workplaces in mechanical industries in 1930, almost 60% of

employment in printing (*grafisk*) industry in 1950, and 65% of national employment in electrotechnical (and the emerging electronic) industry in 1960.⁸

There is also a clear regional pattern in the development of industry in Norway during the 1970s, 1980s and 1990s. Sectors that are considered the most promising, the newest and the most knowledge based first emerged in the Oslo-region. This was industry that uses and develops new technology and which offers crucial services for other industries. Examples are consultancies, high-tech industries and of course the information- and communication technology industry. In addition to creating employment in themselves, these activities promote development also in other business areas.

Thus, research indicates that there is an important division of labour between regions, where the Oslo-region has had as its specific task to foster new industries, to develop and employ new knowledge and competence, and in this way pioneer commercial activities which over time can diffuse to other regions in the country. Oslo also has a role to play as a supplier of important competence to other parts of the country, for instance through commercial knowledge intensive business services. Oslo has had more than half of the national employment in this sector from 1950 until the 1990s.

It is not trivial to explain why new industries originate in Oslo. However, it is probable that the concentration of, and access to, relevant information has been favourable for business development in Oslo. Among other things, a large and sophisticated R&D sector, a rich flora of firms in diverse industries which could act both as suppliers and as customers, and the presence of knowledge-intensive business services have made establishment of new firms feasible. The Oslo-region is also the largest and most advanced market, and has the best general transport and communication infrastructure in the country.⁹

Another explanation takes as a starting point that new firms often grow out of (spin off from) existing industries and technological milieus. In this perspective, the Oslo-area has had *incubators* – milieus and organisations that have brought forth new firms and new activities. The leading R&D institutions have played a role here, among them FFI and SI (from which spin-offs have been given birth to several new information- and communication technology based firms). Also other large firms can be the “give birth” to new firms: Employees that have built competence and skills may leave the company and start new and successful firms.

⁸ Isaksen, A. (1991), *Storbyene som opphavssted for nye næringer*. In: Bildeng, M. og R. Fürst (red.), *Norge trenger en storbypolitikk*. Kommuneforlaget

⁹ That Oslo has lost a lot of industry to other regions, an issue that we have seen has been the theme of earlier analysis, is explained by the fact that for more mature and routine-based industry, price competition is a crucial concern, and lower costs outside Oslo is a key attraction.

Research seems to indicate, thus, that R&D may play a crucial role in promoting the growth of new industry in the Oslo region. Several publications are concerned with this, and with what it takes to make the investments in R&D and academic research pay off more than what it does today. The report *R&D-activity in Oslo: A presentation of some central R&D data* is one source of information on R&D in the region. Also the evaluation reports on *Forskningsparken* is relevant in this context.

Concluding analysis

The different thematic groups we have discussed have quite different characteristics. Several groups reflect that short and medium term policy concerns often is the trigger for research on industry performance, innovation and regional industry policy in the Oslo region. As a consequence, many projects are carried out with so narrow limits for time and resources that it becomes impossible to develop analyses and results that are of significant academic quality and which have lasting value.

In addition, we see the problems of lacking co-ordination in research and in project formulation: We find a plethora of studies of industrial structure and development, of which many appear to be overlapping, and where the character of half-baked and made-in-a-hurry research appears to reduce the validity and the comparability of the various results.

Beyond these general concerns, the status of research can be summed up in the following way: The cluster- and policy-studies carried out by NIBR has developed a significant fundament for further research. The analyses of value chains, functional diversification and clusters have been a major impetus to development of serious research. At the same time, new research which uses systems perspectives, and focuses on innovation learning and regional and local industrial dynamics delivers promising perspectives, but still lacks a specific focus on the Oslo-region that would make the research really important for the RITTS Oslo Project.

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Part 2: Economic activity in the Oslo region

By Thor Egil Braadland

Introduction

What is actually going on in the Oslo region? Which industries are large, which industries are growing, and in which industries do we find the largest companies? How innovative is the Oslo region, and how does the Oslo region business activity put itself on the map with respect to attracting qualified IT personnel? These questions are answered in this chapter, which looks at what we broadly may term 'economic activity in the Oslo region'.

First we look briefly at the structural change in services and manufacturing employment taking place in the Oslo region the last 40 years, and we also place this development in a broader, national frame.

We then turn to look more specifically at services; focussing on employment, industrial structure within services and the company size structure in different industries. Then we go on to look at manufacturing industries in the Oslo region. First we look at the general trend in gross value of production (turnover) in the Oslo companies, before we look more specifically at industry-specific employment, industry structure and company size structure. Finally, we look at core knowledge and innovation features within the regional economy.

From manufacturing industry to services

Measured in employment, manufacturing activities has decreased in the Oslo region the last 40 years with almost 60 percent. Table 1 brings a historical overview of sectoral employment in the Oslo region. In 1950, the share of people working in manufacturing industries was about 40 percent, in 1990 the share had fallen to 17,7 percent. At the same time, share of people working in services has risen from 53 percent to 81 percent.

Table 1: Sectoral employment development 1950-1990 in Oslo region: Sectoral employment shares within Oslo region, and the Oslo region employment as share of national sectoral employment (source: Isaksen, A. and O. Spilling, 1996: Regional utvikling og små bedrifter, Høyskoleforlaget, Kristiansand)

Year	Share of employment within Oslo region			Oslo region employment as share of national employment		
	Farming and forestry	Manufacturing	Services	Farming and forestry	Manufacturing	Services
1950	6,4	39,7	52,9	5,3	23,2	30,5
1960	4,2	36,8	58,6	4,9	22,5	30,0
1970	2,5	28,7	60,4	4,2	20,0	29,2
1980	1,7	21,8	75,6	4,6	16,3	26,9
1990	1,3	17,7	81,0	4,7	15,4	26,0

The table also shows that employment in the Oslo region as share of national employment has fallen in all three categories. The region's share of national employment in services in 1950 compared with the share in 1990 shows a reduction from 30 percent to 26 percent. At the same time, the region's share of national manufacturing employment has fallen from 23 percent to 15,4 percent. Share of people working in primary sector has also sunken, from 5,3 to 4,7 percent.

What this means is that with 1950 as our starting point, services employment has grown faster in other parts of the country than in the Oslo region, while employment in manufacturing industries has fallen faster in this region than in the rest of the country.

In the next section, we take a closer look at services. Here we look at employment and company structure in the Oslo region.

Services

There are several ways - and several problems related to these ways - to measure employment and company structure in a region. Different dataset may be based on different ways of registering employment, and may hence vary in results¹⁰. A central question is also what we really mean by the term 'employment in the Oslo region'. One possible interpretation is to look at companies actually located in the Oslo region, and count employment in these companies.. By counting this way, we also count people living outside the Oslo region, working in the companies located within the region. Vice versa, by counting people living in Oslo, we run the risk to 'loose' persons working outside the Oslo region. In industries or areas where commuting is high, the way we chose to attack this problem may affect our results in some way.

¹⁰ We have used the Register files from National Bureau of Statistics as main basis for the statistical material presented here. This database is given a brief presentation in the Appendix.

In the following, we have based our work on the latter model; to map people by where they live. The advantage is that we map the actual social structure; what we map is what people living in the Oslo region actually do for a living, what activities that shape their daily lives. The disadvantage is that in those cases where there is a discrepancy between where people live and where they work (in a geographical sense), we do not map the industrial activity in the Oslo region per se. We have also chosen to divide the Oslo region in two; Oslo county and Akershus county.

Employment and company size structure in services

Oslo

Table 2 shows an overview of employment and number of companies in service industries in Oslo in 1996¹¹. The largest industries measured in employment are ‘retail’, ‘transport’ and ‘other services’¹², with respectively 36.000, 18.500 and 12.000 employees (8.000, 1.900 and 1.900 companies). These three industries represent about 50 percent of all services in Oslo. ‘Hotels and restaurants’ is the fourth largest industry, with 9.500 employees (1.400 companies) followed by financial services and computing.

Table 2: Oslo, employment and number of companies in service industries, 1996, (source: SSB employment register¹³)

	Employees	Companies
Retail	35693	7878
Hotels and restaurants	9451	1395
Transport, storage and communication	18428	1926
Financial services	6118	153
Insurance	2252	79
Real estate	2874	890
Renting	708	144
Computing	4733	486
R&D	2119	93
Other services	11843	1855
Counseling	4128	1083
Technical counseling, testing and analysis	4536	415

¹¹ What we broadly has termed ‘company’ is a single, local activity unit (usually referred to as an establishment). ‘Companies’ are here regarded as opposed to ‘enterprises’, which may include several companies.

¹² ‘Other services’ are ‘advertising’, ‘labor recruitment and provision of personnel’, ‘investigation and security services’, ‘industrial cleaning’ and ‘miscellaneous business activities’ (NACE 74.4-74.8)

¹³ ‘Employment in Oslo’ is here defined as persons living in Oslo. ‘Companies in Oslo’ refers to companies located in Oslo. Same for Akershus. This means that in those cases where people live in Akershus and work in Oslo, they are counted as ‘employment in Akershus’.

Akershus

Table 3 shows employment and companies in different service industries in Akershus in 1996. The structure is very much the same as in Oslo, with 'retail', 'transport' and 'other services' as the largest service industries; respectively 42.000, 17.500 and 11.500 employees.

Table 3: Akershus, number of employees and number of companies in service industries, 1996, (source: SSB employment register)

	Employees	Companies
Retail	41901	463
Hotels and restaurants	5200	320
Transport, storage and communication	17574	183
Financial services	5279	84
Insurance	2252	144
Real estate	1922	675
Renting	711	134
Computing	3664	444
R&D	1823	100
Other services	11472	1138
Counseling	3227	1228
Technical counseling, testing and analysis	1578	852

Oslo region

Figure 1 and Table 4 show how services in the Oslo region (both Oslo and Akershus) distribute with respect to company size¹⁴. The figure shows share of employment in different company sizes; 1-9 employees, 10 to 49 employees and more than 50 employees. We see that the two industries with most employment in large companies are not surprisingly 'financial services' and 'insurance', with about 90 percent of employment in large companies. The service industries with most employment in small companies are 'retail' and 'real estate', with about 75 percent of employment in companies with less than 50 employees.

¹⁴ Due to statistical classification reasons, we have joined 'counselling' and 'technical counselling, testing and analysis' with 'other services'

Figure 1: Company structure in different service industries in the Oslo region, by share of employment within company size (1-9, 10-49 and 50+), 1996 (source SSB employment register)

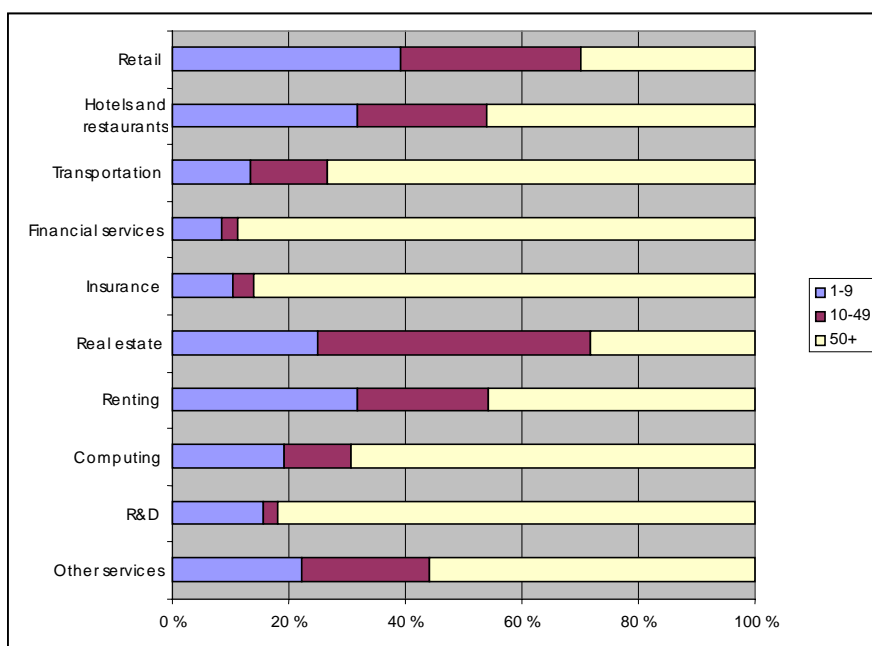
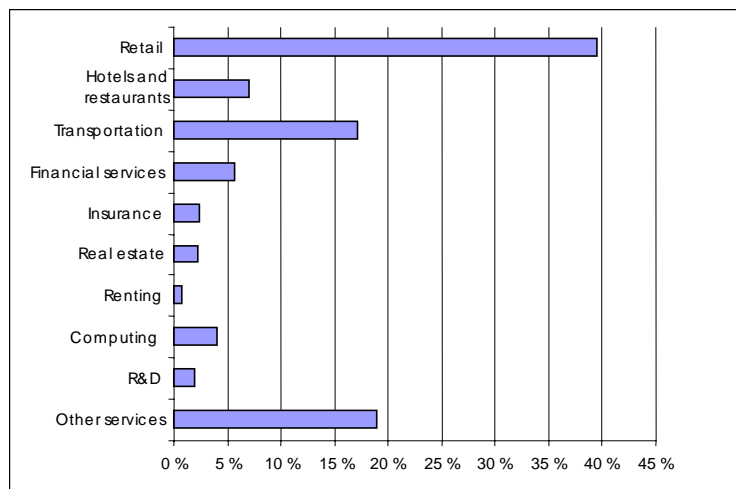


Table 4: Company structure in different service industries in the Oslo region, by share of employment within company size (1-9, 10-49 and 50+), 1996 (source SSB employment register)

	1-9	10-49	50+
Retail	39,2 %	31,0 %	29,8 %
Hotels and restaurants	31,7 %	22,3 %	46,0 %
Transportation	13,3 %	13,2 %	73,5 %
Financial services	8,5 %	2,7 %	88,8 %
Insurance	10,4 %	3,6 %	86,0 %
Real estate	25,1 %	46,7 %	28,3 %
Renting	31,7 %	22,7 %	45,6 %
Computing	19,1 %	11,6 %	69,4 %
R&D	15,7 %	2,3 %	82,0 %
Other services	22,1 %	22,0 %	55,9 %

Figure 2 presents employment in each service industry as share of all service employment. 'Retail' is the largest employing sector, with almost 40 percent of all service employment. Both 'retail', 'transportation' and 'other services' represent more than 15 percent of service employment, followed by 'hotels and restaurants' and 'financial services' on about 5 percent of service employment.

Figure 2: Share of employment in different service industries in the Oslo region, 1996 (source: SSB employment register)



In the next section, we look at manufacturing industries. We look at gross value of production, employment and industrial and company size structure.

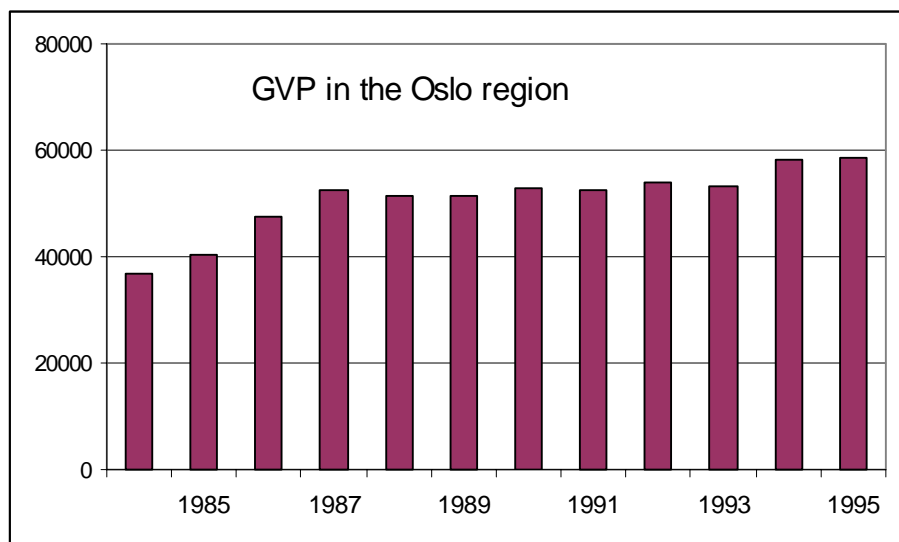
Manufacturing industries

Gross value of production

We saw in Table 1 that employment in manufacturing industries in the Oslo region has fallen the last 40 years, from 40 to 18 percent of all employment. Still, as we shall see, the gross value of production in manufacturing industries has risen slowly from mid 80s to mid 90s. Figure 5 shows the gross value of production in the Oslo region from 1984 to 1996. The gross value of production has increased by 60 percent in this period, from 37 billion NOKs in 1984 to 59 billion NOKs in 1995¹⁵.

¹⁵ Gross value of production (GVP) is the more or less equivalent to sum of turnover in all companies located within the region (there are some industry-specific exceptions; see latest issue of Manufacturing Statistics, SSB), including special taxes, but excluding VAT. GVP is defined as the sum of goods produced on own account, repair work for others, mounting or installation of own products or merchandise, contract work, other work, own-account investment work, own-account repair work, rental receipts and gross profits of goods sold in the same condition as purchased.

Figure 3: Gross value of production in the Oslo region 1984-1995, current prices (source: SSB industrial statistics 1984-1995), in million NOKs.

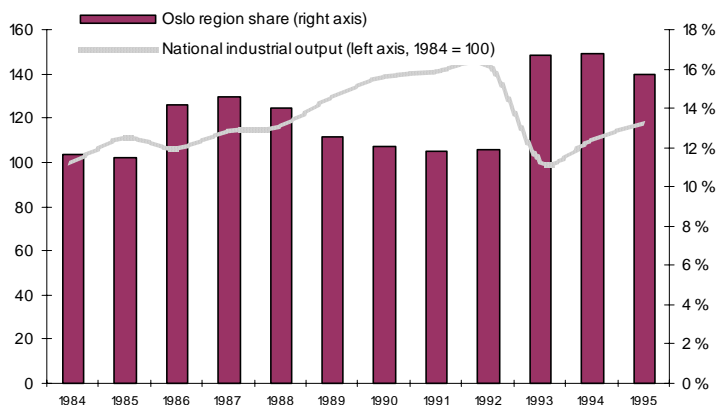


How do these figures relate to the national industrial activity? Is the gross value of production in Oslo region decreasing relative to national average, or is it increasing in activity?

As we shall see, it seems that the industrial activities in the region actually have increased the last years. Figure 4 shows the regions' gross value of production as share of national manufacturing gross value. In the periode before 1993, the share was between 12 and 14 percent of national production. In the periode from 1993 to 1995, the share is centered around 16 percent¹⁶.

¹⁶ This may relate to the statistical reclassification of 1993, when Norway implemented a new way of categorising company statistics - a transition from the traditional ISIC classification to the UN NACE classification. As we can see from the national index in Figure 4, the national index, steadily growing from 1984 to 1995 - fell from 140 to 100 this year. It is likely that this dramatic fall is caused by the change of classification system, which again has altered the Oslo region's share of national GVP.

Figure 4: National manufacturing gross value of production index 1984-1995 (left axis, 1984=100), and gross value of production in the Oslo region as a share of national gross value of production (right axis). (Source: Industrial statistics, SSB 1984-1995)

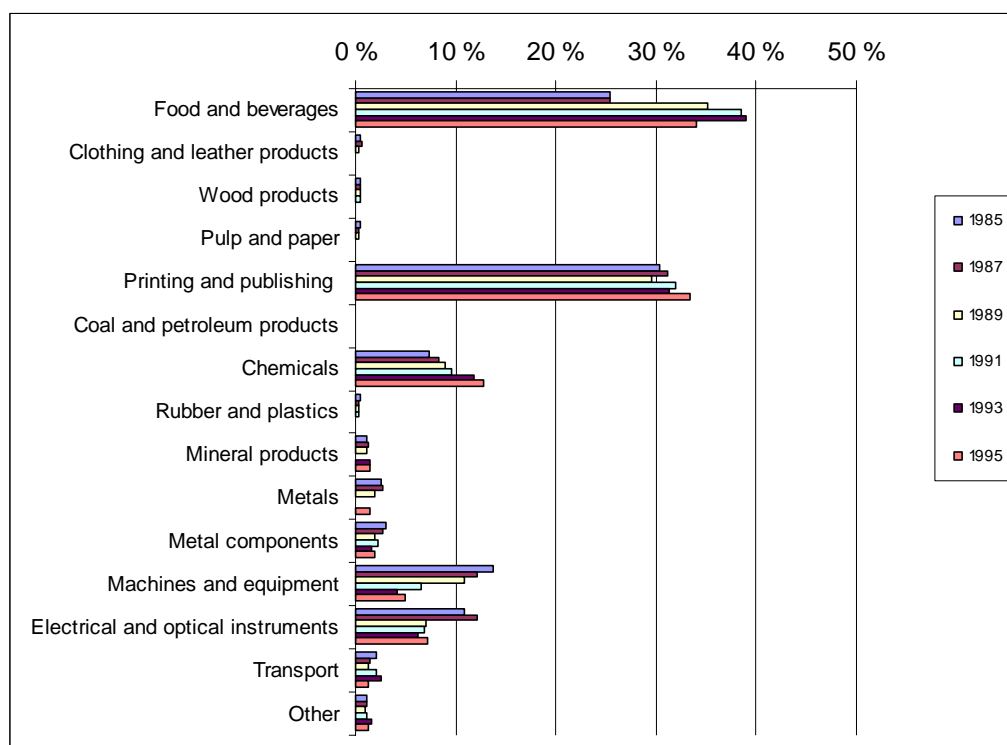


How does the development in growth quantify with respect to different industries in this region? Which industries grows, which are not? Figure 5 and Figure 6 present individual industrial share of gross value production for respectively Oslo and Akershus (biannually) between 1985 and 1995¹⁷. For Oslo, the distribution of GVP is gathered in three large bulks; the largest sectors are 'food and beverages' (35 percent of GVP), 'printing and publishing' (32 percent of GVP), and 'chemicals' (12 percent of GVP). Together, these three sectors contributed to almost 80 percent of all GVP in Oslo in 1995. The figure also shows that these three sectors have been steadily growing the last years (with the exception of food and beverages from 1993 to 1995). The fastest growing sector in Oslo is 'chemicals', increasing from seven to thirteen percent in this period¹⁸. 'Chemicals' was followed by 'food and beverages' (from 25 to 34 percent) and 'mineral products' (from 1,1 percent to 1,4 percent). 'Printing and publishing' increased it's share from 30 to 33 percent, the fourth fastest growing sector in Oslo.

¹⁷ The change from ISIC to NACE standards may have some minor effects on the results also in these statistics. Table with corresponding industries is given in Appendix 1.

¹⁸ Measured in average yearly percentage change in share of GVP between 1985 and 1995

Figure 5: Manufacturing industries' share of gross value production, Oslo, 1985, 1987, 1989, 1991, 1993 and 1995 (source: SSB manufacturing statistics 1985-1995)



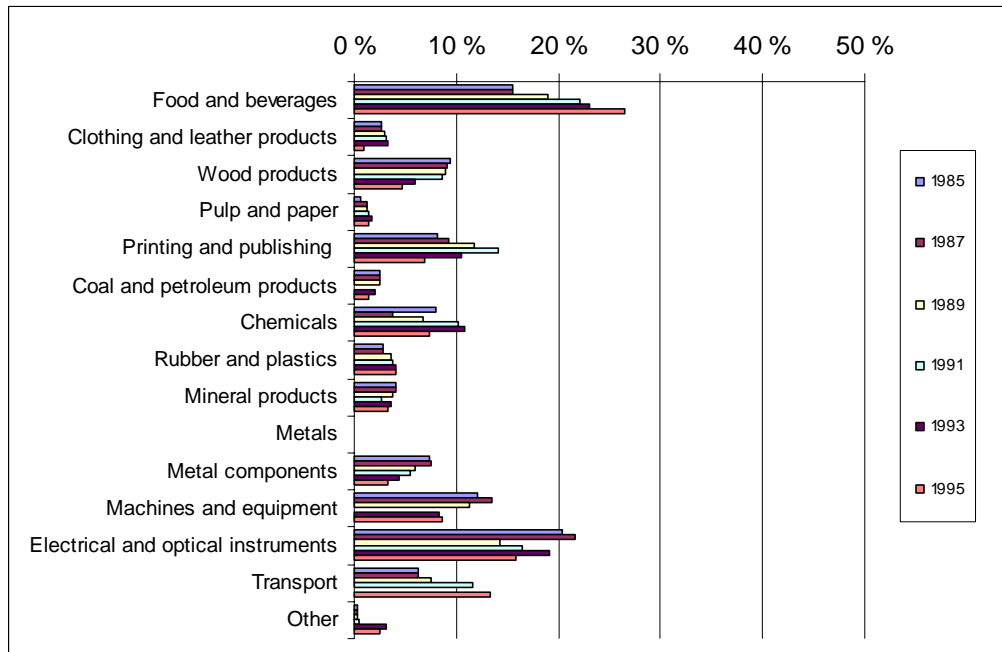
The industry structure in Akershus is much more differentiated than in Oslo, as we can see from Figure 6. The figure shows manufacturing industries' share of gross value production in Akershus. The median of industrial share of GVP is 3,35 percent, compared to 1,5 percent in Oslo. The two largest industries in Akershus in 1995 were 'food and beverages' (as in Oslo), representing 27 percent of GVP, and 'electrical and optical instruments' with 19 percent of GVP. Together with production of vehicles¹⁹ (13 percent of GVP) the three largest sectors in Akershus represent 59 percent of all GVP.

The fastest growing industry in Akershus²⁰ has been two small sectors; 'Transport' increased its share in GVP from six to thirteen percent, whilst 'pulp and paper' increased its share from 0,5 percent to 1,4 percent. 'Food and beverages' is the only sector in Akershus that is both large and growing at the same time. This industry's share of GVP has risen from 15 to 26 percent between 1985 and 1995.

¹⁹ E.g. 'production of transport equipment', denoted as 'transport' in the figures

²⁰ Measured in average yearly percentage change in share of gvp between 1985 and 1995

Figure 6: Manufacturing industries' share of gross value production, Akershus, 1985, 1987, 1989, 1991, 1993 and 1995 (source: SSB industrial statistics 1985-1995)



Employment and company size structure

Oslo

Table 5 shows the size of individual manufacturing industries in Oslo, measured in employees and number of companies. The largest industry is 'printing and publishing', with 6.650 employees and 750 companies. According to these dataset, printing and publishing represent about 1/3 of all manufacturing employment in Oslo.

The second largest industry in Oslo is 'food and beverages', with 3.500 employees and 100 companies. This industry is followed by 'chemicals' (2.300 employees, 31 companies), 'electrical and optical instruments, including IT industry companies' (2.000 employees, 120 companies) and 'Production of transportation equipment' (1.100 employees, 25 companies).

Table 5: Oslo, employment and number of companies in different manufacturing industries, 1996 (N-emp= 19.166, N-comp = 1.452) (source: SSB employment register)

	<i>Employees</i>	<i>Companies</i>
Food and beverages	3590	100
Clothing and leather	54	54
Wood products	157	30
Pulp and paper	113	10
Printing and publishing	6639	730
Coal and petroleum products	10	3
Chemicals	2225	31
Rubber and plastics	206	17
Mineral products	284	36
Metals	311	14
Metal components	660	110
Machines and equipment	1021	83
Electrical and optical instruments	2059	120
Transportation equipment	1098	25
Other	739	89

Figure 7 and Table 6 show the company structure in manufacturing industries in Oslo in 1996. There are three industries with more than 80 percent of employment in companies with more than 50 employees; 'chemicals', 'production of transportation equipment' and 'food and beverages'.

The manufacturing industries with most employees in small companies (1-9 employees) are 'clothing and leather products', 'pulp and paper' and 'wood products'.

Figure 7: Company size structure in manufacturing industries in Oslo, 1996 (source: SSB employment register)

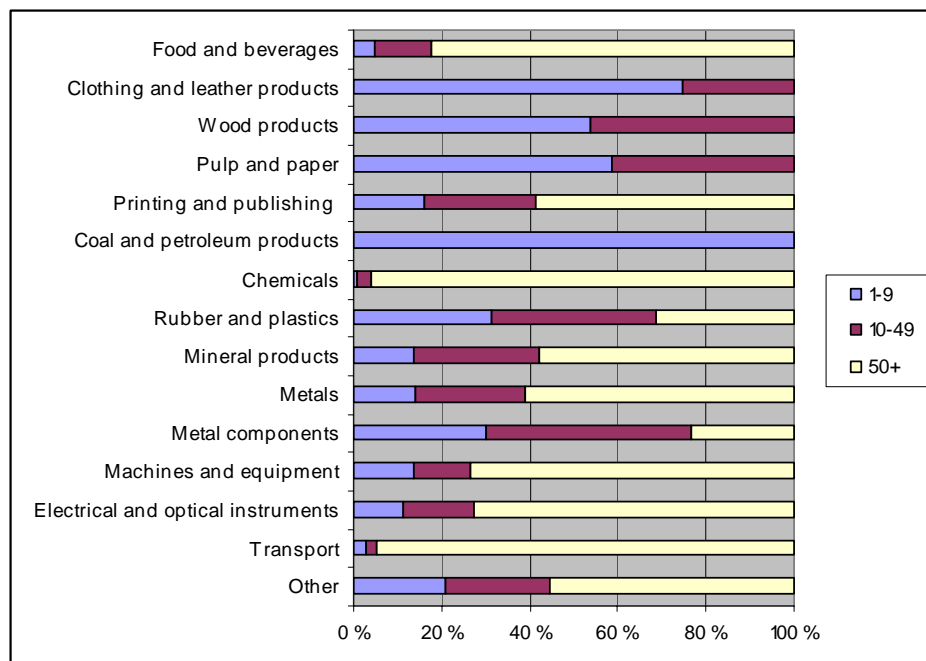


Table 6: Company size structure in manufacturing industries in Oslo, 1996 (source: SSB employment register)

	1-9	10-49	50+
Food and beverages	206	581	3620
Clothing and leather products	152	52	0
Wood products	64	55	0
Pulp and paper	38	27	0
Printing and publishing	1719	2765	6343
Coal and petroleum products	15	0	0
Chemicals	35	109	3362
Rubber and plastics	58	68	58
Mineral products	69	143	290
Metals	34	60	148
Metal components	286	439	220
Machines and equipment	225	214	1224
Electrical and optical instruments	275	400	1779
Transport	51	40	1670
Other	229	260	609

Akershus

Table 7 shows employment and number of companies in different manufacturing industries in Akershus in 1996. The largest sector is 'food and beverages', with 3.500 employees and 252 companies. 'Food and beverages' represented about 1/6 of all manufacturing employment in Akershus in 1996. The following manufacturing

industries are ‘electrical and optical instruments (including IT), ‘chemicals’, ‘printing and publishing’ and ‘machines and equipment’, with respectively 2.700, 2.000, 1.750 and 1.700 employees.

Table 7: Akershus, employment and number of companies in different manufacturing industries, 1996 (N-emp= 18.209, N-comp = 2.386), (source: SSB employment register)

	<i>employees</i>	<i>companies</i>
Food and beverages	3424	252
Clothing and leather	279	80
Wood products	794	117
Pulp and paper	176	44
Printing and publishing	1767	682
Coal and petroleum products	31	8
Chemicals	2027	76
Rubber and plastics	779	72
Mineral products	585	84
Metals	208	33
Metal components	975	224
Machines and equipment	1703	175
Electrical and optical instruments	2684	251
Transportation equipment	1686	112
Other	1091	176

Figure 8 and Table 7 show the company size structure in manufacturing industries in Akershus in 1996. The industries with highest employment shares in large companies are ‘metals’ (91 percent), ‘food and beverages’ (80 percent) and ‘production of transportation equipment’ (79 percent).

The industries with highest share of employees working in small companies, are ‘coal and petroleum products’ (100 percent), ‘metal components’ (25 percent) and ‘clothing and leather’ (30 percent).

Figure 8: Company size structure in manufacturing industries in Akershus, 1996
(source: SSB employment register)

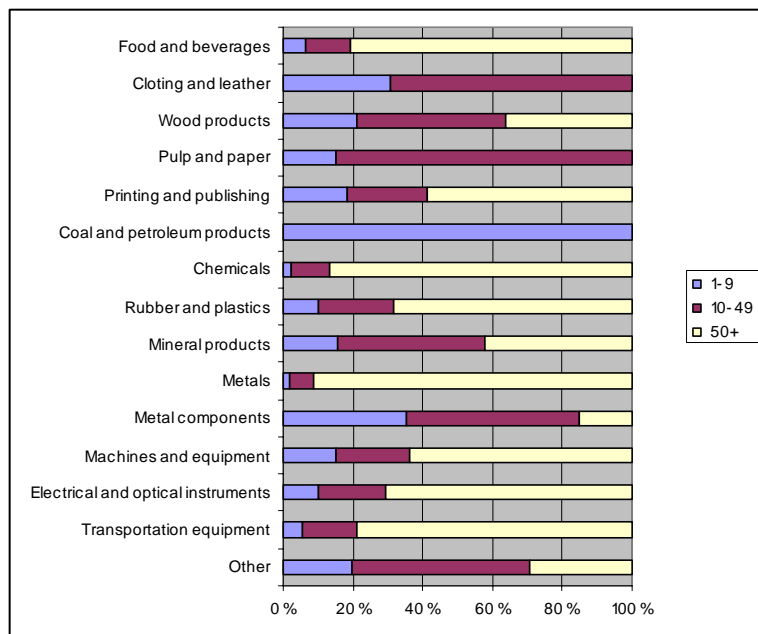


Table 8: Company size structure in manufacturing industries in Akershus, 1996
(source: SSB employment register)

	1-9	10-49	50+
Food and beverages	236	474	2954
Clothing and leather	82	185	0
Wood products	184	376	317
Pulp and paper	25	138	0
Printing and publishing	430	536	1365
Coal and petroleum products	16	0	0
Chemicals	34	173	1344
Rubber and plastics	80	174	553
Mineral products	77	212	211
Metals	3	11	145
Metal components	254	360	108
Machines and equipment	194	272	828
Electrical and optical instruments	247	467	1729
Transportation equipment	87	249	1245
Other	156	406	231

Figure 9 shows how employment has evolved in different manufacturing industries in Oslo between 1984 and 1995²¹. These figures are relative, i.e. they show how different industries has changed their size relative to the rest of the manufacturing industries. As for GVP (above) we see that manufacturing production in Oslo is centred around certain industries. About 40 percent of industrial employment was in

1995 within 'printing and publishing', and 'food and beverages' represented together with chemicals about 30 percent of manufacturing employment in Oslo in 1995.

We see that there are three sectors that have increased their share of industrial employment in Oslo the last decade; 'printing and publishing', 'chemicals' and 'production of transportation equipment'. 'Food and beverages' has gone through a minor decrease in relative size, while employment in most other sectors have decreased more than average manufacturing decrease.

Figure 9: Share of employment in manufacturing industries, Oslo, 1984 (N=36.440) and 1995 (N=23.681) (source: SSB manufacturing statistics)²¹

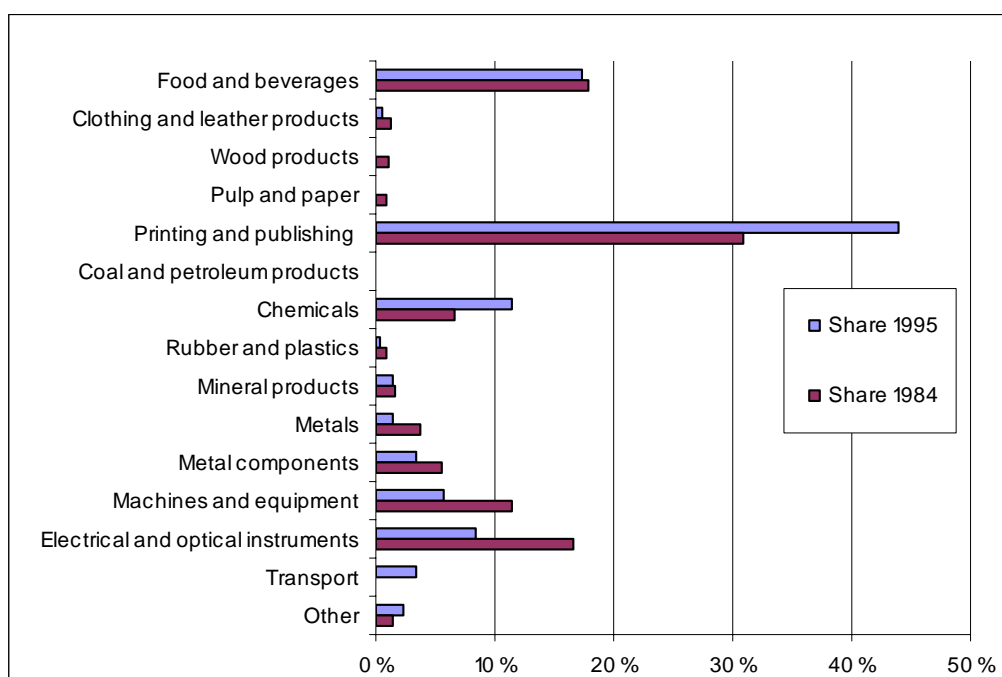
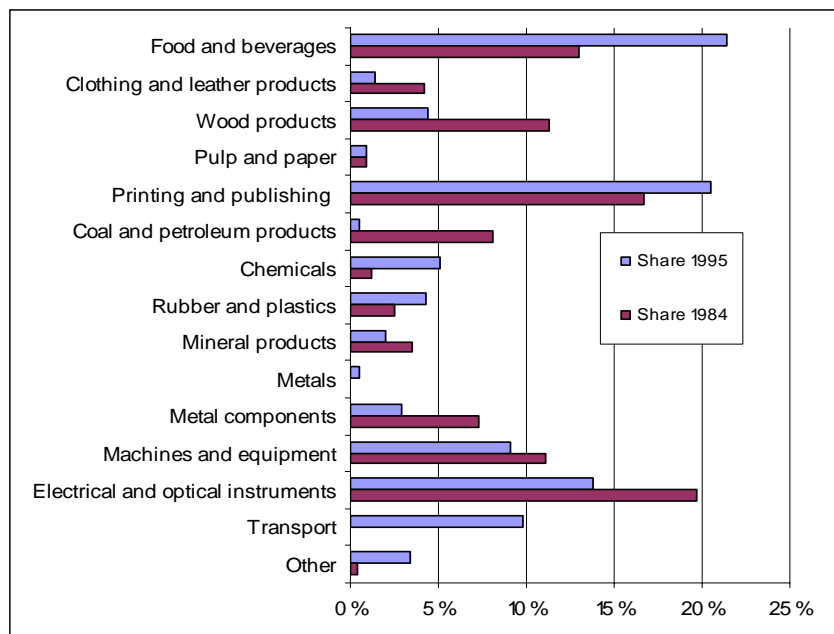


Figure 10 shows the same figures for Akershus. We see that the industrial structure in Akershus is much more differentiated than in Oslo, with the two largest industries - 'food and beverages' and 'printing and publishing' - representing 20 percent of manufacturing employment each. As for Oslo, the largest manufacturing industries in Akershus show a less negative development than the rest of the industries. Both 'food and beverages' and 'printing and publishing' have increased their relative share of manufacturing employment. In addition, even though the third largest industry, 'electrical and optical instruments (including IT)' has reduced its share from 20 to 15 percent, it is still a relatively large industry.

Other industries which have increased their share of total manufacturing employment in Akershus are 'chemicals', 'rubber and plastics' and 'production of transportation equipment'.

Figure 10: Share of employment in manufacturing industries, Akershus, 1984 (N=16.185) and 1995 (N=14.917) (source: SSB manufacturing statistics)²¹



Knowledge and innovation

International regional studies have increasingly emphasised the role of knowledge development and development of personal competencies as central to internal, regional development. This approach is based on the view that there exist tight links between innovation and learning: Innovation is regarded as inseparable from learning, because innovation by definition involves doing something new, learning something new.

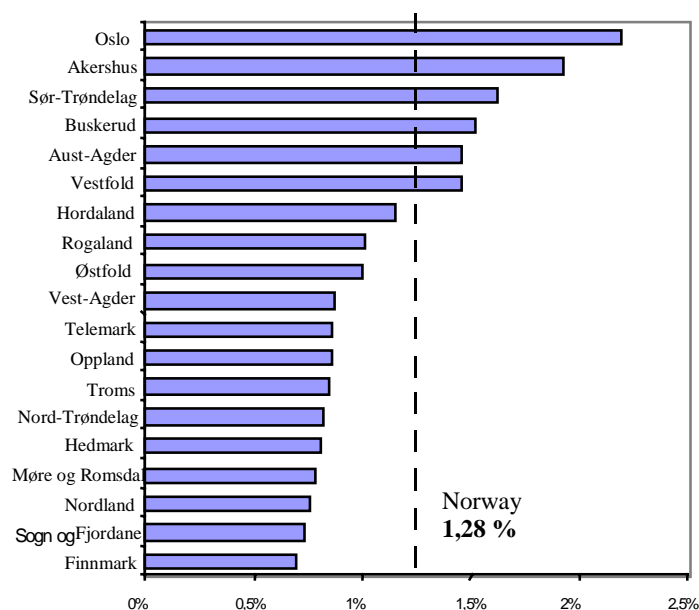
A great deal of innovation and learning activities is today centred around implementation, use and development of IT. This activity is not restricted to IT producers, it is a process that is much wider; most of the IT-related innovation take place in so-called IT-user industries. The problem is how we measure this kind of activity. Regular industrial statistics sort companies by their main product, not by input factors: However “IT-ficated” or technologically advanced, a furniture factory is - at least in the industrial statistics - still a furniture factory.

How do we then sort out the actual IT-activity in a region? We have above stressed that a central aspect to innovation is the individual employees’ skills. This ultimately means that if we can find an indicator that measures individual IT skills, we would have a good proxy to what we are looking for. In Figure 11, we present the share of employees in each county having formal IT competencies, i.e. University or College background in IT. We see that the Oslo region (Oslo and Akershus) comes out as the

²¹ Employment is here defined as ‘working in a company located in resp. Oslo/Akershus’, and not by place of living as in previous tables/figures.

most intensive IT region in Norway, with a more than 150 percent higher IT share than national average. In Akershus, about 2 percent of all employees have formal IT background, while in Oslo, 2,2 percent of all employees have such a background. National average is 1,28 percent.

Figure 11: Share of employment with formal IT competencies (University and College graduates), 1996, all counties



Innovation in the Oslo region

The Community Innovation Survey in 1997 addressed question on innovation and technological developments to a set of Norwegian companies, amongst them about 800 companies in the Oslo region. The basic question asked was whether the firm had innovation activity in the period of 1995-1997?²²

From Table 9 we see that companies in the Oslo region are slightly more innovative than average for Norway. 42,58 percent of Oslo companies responded they had performed innovative activity the last three years, compared to 41,77 for the nation as a whole.

From the table we also see that it is in particular the small companies in the Oslo region that are most innovative compared to national average. 41 percent of the small

²² A firm is innovative if it has had performed either of the three activities in the timeperiod: i) Introduction of any technologically new or improved products. ii) Introduction of any technologically new or improved processes (for the service sector a firm is registered as innovative if it has answered yes to the question: Has your firm introduced into the market any new or significantly improved services or methods to produce or deliver services?) or iii) Had unsuccessful or uncompleted projects to develop or introduce technologically new or improved products or processes.

companies (10-49 employees) answered 'yes' to if they had innovated, whilst 34 percent did the same on a national level. For companies with 50-99 employees there are no differences between the Oslo region companies and Norway as a whole. For the large (100+ employees), the Oslo region companies are a little less innovative than the country as a whole (72,7 percent to 79,8 percent).

Table 9. Innovation activity in the period of 1995-1997 (source: CIS 1997)

Employees	Oslo region			Norway		
	Yes	No	N	Yes	no	N
10-49	40,62	59,38	409	33,95	66,05	1843
50-99	86,67	13,33	107	86,26	13,74	496
100+	72,71	27,29	320	79,79	20,21	924
Total	42,58	57,42	100%	41,77	58,23	100%
N	356	480	836	1363	1900	3263

Innovation activity can be separated into two categories, 'introducing a new product or service' and 'improving existing product or service'. Table 10 shows that companies in the Oslo region have higher shares of turnover from new products than companies in the rest of the country. In the Oslo region, in average more than 15 percent of turnover in innovating companies come from new products or services. In the rest of the country, the share is 12,5 percent. Share of turnover coming from improved products and services is about the same as rest of the country.

Table 10. Estimation of the turnover in 1997 from technologically new or improved products.

Average turnover	Oslo region		Norway	
	Average	N	Average	N
New products/services	15,12%	285	12,51%	1216
Improved products/services	11,49%	256	12,06%	1173
Unchanged products/services	74,31%	256	77,90%	1173

Table 11 shows that it is small and medium-sized companies (SMEs, here: 1-99 employees) that have the highest turnover share from new products. The table also shows that turnover in small companies are more related to incremental innovations (improved products or services) than completely new products, while the situation is completely opposite for medium-sized companies. For large companies, share of turnover from respectively new products and improved products are much the same; 13 and 12 percent.

If we compare the Oslo region industry with the results from the whole country (Table 12), we see that all company sizes in the Oslo region have a turnover share from new products or service than the rest of the country. This is particularly valid

for SMEs, which have approximately 5 percent points higher shares than other SMEs in Norway.

Table 11. Estimation of the turnover in 1997 due to technologically new or improved products, by size of firms in the Oslo region.

Types of products/services	Oslo region					
	Number of employees 10-49		Number of employees 50-99		Number of employees 100+	
	Average	N	Average	N	Average	N
New products/services	17,00%	109	17,45%	33	13,15%	143
Improved products/services	11,56%	97	8,73%	30	12,08%	129
Unchanged products/services	72,29%	97	74,16%	30	75,86%	129

Table 12. Estimation of the turnover in 1997 due to technologically new or improved products, by size of firms in Norway.

Types of products/services	Norway					
	Number of employees 10-49		Number of employees 50-99		Number of employees 100+	
	Average	N	Average	N	Average	N
New products/services	12,86%	536	12,95%	209	11,91%	471
Improved products/services	12,30%	519	10,56%	202	12,47%	452
Unchanged products/services	75,29%	519	77,30%	202	75,97%	452

Summing up

This chapter have been a presentation of the economic activity in the Oslo region. We have used measures as sectoral and industrial employment, gross value of production, competencies and innovation activities as crude ways of understanding the economic basis of the region.

We have seen that services make up over 80 percent of employment in the region, and that the largest industries in services are retail and transport. About 80.000 person (40 percent of all service employment) work in retail in the Oslo region, about 35.000 persons work in transport, storage and communication (17 percent). Finance and insurance are not surprisingly the two industries with the largest share of employment working in large companies; approximately 90 percent. In the other end of the scale we find real estate and retail, with 25 percent. In Akershus, the industries with highest employment shares in large companies are 'metals' (91 percent), 'food and beverages' (80 percent) and 'production of transportation equipment' (79

percent). The industries with highest share of employees working in small companies in Akershus are 'coal and petroleum products' (100 percent), 'metal components' (25 percent) and 'clothing and leather' (30 percent).

The Oslo region is here defined as the two counties Oslo and Akershus. With respect to manufacturing industrial structure, there are big differences between the two counties. In Oslo, the activity is confined to three large sectors; food processing, printing and publishing, and chemicals. Together, these three sectors contributed to almost 80 percent of all GVP in Oslo in 1995. These three sectors have also been steadily growing the last years (with the exception of food and beverages from 1993 to 1995). The fastest growing sector in Oslo is 'chemicals', increasing from seven to thirteen percent in this period²³. 'Chemicals' was followed by 'food and beverages' (from 25 to 34 percent) and 'mineral products' (from 1,1 percent to 1,4 percent). 'Printing and publishing' increased its share from 30 to 33 percent, the fourth fastest growing sector in Oslo.

The industry structure in Akershus is much more differentiated than in Oslo. The two largest industries in Akershus in 1995 was 'food and beverages' (as in Oslo), representing 27 percent of GVP, and 'electrical and optical instruments' with 19 percent of GVP. Together with production of vehicles²⁴ (13 percent of GVP), the three largest sectors in Akershus represent 59 percent of all GVP. The fastest growing industries²⁵ in Akershus has been two small sectors; 'Transport' increased its share in GVP from six to thirteen percent, whilst 'pulp and paper' increased its share from 0,5 percent to 1,4 percent. 'Food and beverages' is the only sector in Akershus that is both large and growing at the same time. This industry's share of GVP has risen from 15 to 26 percent between 1985 and 1995.

In Oslo, there are three manufacturing industries with more than 80 percent of employment in large companies. These are 'chemicals', 'production of transportation equipment' and 'food and beverages'. The manufacturing industries with most employees in small companies (1-9 employees) are 'clothing and leather products', 'pulp and paper' and 'wood products'. The largest sector in Akershus is 'food and beverages', with 3.500 employees and 252 companies. 'Food and beverages' represented about 1/6 of all manufacturing employment in Akershus in 1996. The following manufacturing industries are 'electrical and optical instruments (including IT)', 'chemicals', 'printing and publishing' and 'machines and equipment', with respectively 2.700, 2.000, 1.750 and 1.700 employees.

The Oslo region comes out as the most intensive IT region in Norway, with a more than 150 percent higher share of employees with formal IT competencies than national average. In Akershus, about 2 percent of all employees have formal IT background, while in Oslo, 2,2 percent of all employees have such a background. National average is 1,28 percent.

²³ Measured in average yearly percentage change in share of GVP between 1985 and 1995

²⁴ E.g. 'production of transport equipment', denoted as 'transport' in the figures

²⁵ Measured in average yearly percentage change in share of gvp between 1985 and 1995

It is in particular small companies in the Oslo region that are most innovative, compared to national average. 41 percent of the small companies (10-49 employees) answered 'yes' to if they had innovated, whilst 34 percent did the same on a national level. For companies with 50-99 employees there are no differences between the Oslo region companies and Norway as a whole. For the large (100+ employees), the Oslo region companies are a little less innovative than the country as a whole (72,7 percent to 79,8 percent).

Part 3: Knowledge infrastructure in the Oslo-region

By Heidi Wiig Aslesen

Introduction

All firms operate within a complex set of knowledge bases. A knowledge base consists of the resources which firms draw upon in order to develop, adjust and sell new products. In this section we will empirically map the institutional structure of production of knowledge in the Oslo-region, which firms can use as potential resources in their innovation process. The aim is to provide an overview of the structure of the suppliers, and we divide the 'supply side' of knowledge for businesses into 4 categories;

1. Universities and research institutes that create scientific knowledge for national industry.
2. Science Parks as an innovative environment for different research and commercial activities.
3. Organisations that both generate and diffuse knowledge to national industry, and function as network actors in the innovation system. This section also gives an overview of private associations, interest organisations and organisations that give financial support to businesses.
4. The private consultancy sector.

Science and Technology Infrastructure

University and Higher Education Institutions, and Research Institutions in Oslo and Akershus

This section will give an overview of the science and technology infrastructure in Oslo and Akershus. This region is a locational option for a large share of the countries' universities, colleges and higher education institutions²⁶, and research institutions in Norway. This knowledge infrastructure can be a potential input into firms' innovation, and surveys suggest that they do have a positive effect. Central areas have a large number of firms in innovative industries, firms which make use of R&D in the innovation process. Firms also obtain information from basic-research institutes to a larger degree than other geographical areas (Isaksen 1996)²⁷. **

²⁶ In this section we have listed universities, colleges and higher education institutions that are under the Ministry of Education, Research and Church affairs.

²⁷ Isaksen, Arne, 1996: *Location and innovation. Geographical variations in innovative activity in Norwegian manufacturing industry*, report 3/96, STEP Group, Oslo.

Table 13. Overview of registered students, scientific personnel at universities, higher education institutions and state colleges in Oslo and Akershus. Source: St.prp.nr.1 (1997-98) for the Ministry of Education, Research and Church affairs and NIFU.

County	Universities and Colleges	Registered Students in 1996 ²⁸	Scientific Personnel
Akershus	Centre for Technology at Kjeller – UNIK	Appr. 100	N/A.
	Agricultural University of Norway (Ås)	2628	392
	Akershus College	1815	110
Oslo	The University of Oslo	34786	3167
	Oslo School of Architecture	326	40
	Norwegian University of Sport and Physical Education	750	69
	Norwegian State Academy of Music	472	76
	Norwegian College of Veterinary Medicine	399	143
	Norwegian State Academy of Art	461	N/A.
	Oslo College	7855	475

Table 14. Private Higher Education Institutions located in Oslo and Akershus. Source: St.prp.nr.1 (1997-98) for the Ministry of Education, Research and Church affairs and NIFU.

Main subjects	Institutions	Number of students registered in 1996
Health and socialwork	Diakonhjemmets College	824
	Menighetssøster hjemmets Nursing College	193
	Betanien Nursing College	204
	Diakonissehjemmets College	199
	College of Diakonia and Nursing	560
Theological and pedagogical	The Norwegian Lutheran School of Theology	633
	Norsk læreakademi	652
	Dronning Mauds minne	772
	Barrat Dues Music Conservatory	72
	Rudolf Steiner College	99
	Norwegian College of Eurytmi	25
Economy, data and engineering	Norwegian Academy of Ballet	26
	Norwegian School of Management – BI ²⁹	8790 (in 1997)
	Norwegian School of Business for Trade and Retail Management	405
	The Polytechnic College	799

Approximately 64 000 students were registered at Universities, Colleges and other Higher Education Institutions in the Oslo-Akershus region in 1996, which is approximately 37% of the nation's registered students that year. The University of

²⁸ Registered students eligible to study.

²⁹ The Norwegian School of Management – BI, has more than 17 000 registered students in Norway. This number reflects students registered in the county of Oslo and Akershus.

Oslo has the largest number of students, and is the region's main educational institution, followed by Oslo College. These two institutions account for close to 67% of registered students in Oslo and Akershus. The private colleges have their main activities in the fields of 'Economy, data and engineering', with more than 14 200 students in 1996, the Norwegian School of Management being the dominant actor.

Table 15. Persons 16 years and more, by highest education. Percentage. Source; Statistical Yearbook 1997.

County	Primary School	Upper secondary school	University and Colleges
Akershus	21,5 %	51,6 %	26,8 %
Oslo	21,2 %	46,3 %	32,6 %
For Norway	26,9 %	52,9 %	20,2 %

The Oslo-region has a larger share of persons attending Universities and Colleges than the country as a whole. The average for Norway as a whole is 20.2%, whilst the share for Oslo is 32.6% and for Akershus is 26.8%. This suggests that the region's workforce is highly qualified, potentially affecting each firm's and thereby the region's innovation performance. The educational background of a region is a factor which shapes industrial structure, suggesting a higher share of knowledge based industries in this region.

The Institute sector in Oslo and Akershus

The research institute sector in Norway is substantial; most institutes operate independently and are organised by research activity. The institute sector is therefore an important part of the innovation system in Norway. The bulk of the institute sector is located in the capital region. Below we have listed institutions in Oslo and Akershus that are categorised as research institutes or institutions with some research in addition to other activities (not museums).

Table 16. *Non-University Research Institutions in Oslo and Akershus. Source: "The Institute sector in Norway. A catalogue of Non-University Research Institutions." Report 21/98. Norwegian Institute for Studies in Research and Higher Education.*

County	Norwegian name	English name	Employees in 1997 /1999
Akershus	Institutt for akvakulturforskning	Institute for Aquacultural Research Ltd.	78
	Institutt for energiteknikk	Institute for Energy Technology	620 ³⁰
	Jordforsk- Senter for jordfaglig miljøforskning	Jordforsk - Centre for Soil and Environmental Research	87
	Statens institutt for forbruksforskning	National Institute for Consumer Research	55
	Asfaltentreprenørenes forening. Servicekontor	Norwegian Asphalt Contractors Association	7
	Forsvarets forskningsinstitutt	Norwegian Defence Research Establishment	550
	Norsk institutt for næringsmiddelforskning	Norwegian Food Research Institute	155
	Norsk institutt for skogforskning	Norwegian Forest Research Institute	165
	Norsk institutt for luftforskning	Norwegian Institute for Air Research	135
	Norsk institutt for jord- og skogkartlegging	Norwegian Institute of Land Inventory	140
	Norsk fjørfeavlslag	Norwegian Poultry Association	11
	Det kongelige selskap for Norges vel. Hellerud forsøks- og eliteavlslag	Royal Norwegian Society for Rural Development, The Hellerud Research Farm	30
	Nordisk institutt for odontologisk materialprøving	Scandinavian Institute of Dental Materials	23
	Fridtjof Nansensinstitutt	The Fridtjof Nansen Institute	40
	Landbrukets forskningsringer	The Norwegian Agricultural Research and Extension Group	25
	Norsk institutt for planteforskning	The Norwegian Crop Research Institute	250
	NORSAR	The Norwegian Seismic Array	32
Norsk institutt for planteforskning	Norwegian Crop Research Institute	400	
Oslo	Adm forskningsfond ved Norges handelshøgskole	Administrative Research Institute at the Norwegian School of Economics and Business Administration	32 ³¹
	Kreftregisteret- institutt for epidemiologisk kreftforskning	Cancer Registry of Norway – the Institute for Epidemiological Cancer Research	72
	Norges bank, forskningsavdelingen	Centralbank of Norway, Research Department	15
	Senter for høyere studier	Centre for Advanced Studies	2
	Stiftelsen Kirkeforskning	Centre for Church Research	7
	Senter for internasjonal klima- og miljøforskning	Centre for International Climate and Environmental Research	28
	Chr. Michelsens Research AS	Chr. Michelsens Research AS	100
	Stiftelsen for helsetjenesteforskning	Foundation for Health Service Research	15
	Stiftelsen for samfunn- og næringslivsforskning	Foundation for Research in Economics and Business Administration	100
	Stiftelsen Frischsenteret for samfunnsøkonomisk forskning	Frisch centre for economic Research	7
	Forskningsstiftelsen FAFO	Institute for Applied Social Science	86
	Institutt for Kreftforskning	Institute for Cancer Research	215
	Institutt for samfunnsforskning	Institute for Social Research	44
Flymedisinsk institutt	Institute of Aviation Medicine	23	

³⁰ Number includes both Kjeller and Halden offices.

³¹ Number also includes the Bergen office.

Transportøkonomisk institutt	Institute of Transport Economics	92
Institutt for fredsforskning	International Peace Research Institute	30
Arbeiderbevegelsens Arkiv og Bibliotek	Labour Movements Archives and Library	15
Livsforsikringsseksjonenes medisinskstatistiske institutt	Life Insurance Companies' Institute for Medical Statistics	7
Riksarkivet	National Archives of Norway	80
Statens helseundersøkelser	National health screening service	80
Statens institutt for alkohol og narkotikaforskning	National Institute for Alcohol and Drug Research	20
Statens institutt for folkehelse	National Institute for Public Health	433
Statens rettsksoiologiske institutt	National institute of forensic toxicology	90
Statens arbeidsmiljøinstitutt	National Institute of Occupational Health	105
Technological institutt	National Institute of Technology	265
Veterinærinstituttet	National Veterinary Institute	250
Nic Waals institutt	Nic Waal Institute for Child, Adolescent and Family Psychiatry. Regional Centre for Education and Research	86
Norsk institutt for landbruksøkonomisk forskning	Norwegian Agricultural Economics Research Institute	75
Norges byggforskningsinstitutt	Norwegian Building Research Institute	150
Norsk Regnesentral	Norwegian Computing Center	83
Forsvarets mikrobiologiske institutt.	Institute of Microbiology	10
Norsk etnologisk Granskning	Norwegian Ethnological Research	3
Norges geotekniske institutt	Norwegian Geotechnical Institute	132
Institutt for forsvarsstudier	Norwegian Institute for Defence Studies	17
Stiftelsen norsk mat – og miljøanalyse	Norwegian Institute for Food and Environmental Analysis	52
Norsk institutt for studier av forskning og utdanning	Norwegian Institute For Studies In Research and Higher Education	62
Norsk institutt for by- og regionsforskning	Norwegian Institute for Urban and Regional Research	91
Norsk institutt for vannforskning	Norwegian Institute for Water Research	200
Norsk Utenrikspolitisk institutt	Norwegian Institute of International Affairs	70
Norsk lokalhistorisk institutt	Norwegian Institute of Local History	6
Norsk lokalhistorisk institutt	Norwegian Institute of Local History	6
Norsk treteknisk institutt	Norwegian Institute of Wood Technology	36
Norsk Kjøtt	Norwegian Meat	34
Det norske meteorologiske institutt	Norwegian Meteorological Institute	455
Det Norske Nobelinstituttet	Norwegian Nobel Institute	9
Norsk polarinstitutt	Norwegian Polar Institute	130
Statens strålevern	Norwegian Radiation Protection Authority	77
Norges vassdrags- og energiverk	Norwegian Water Resources and Energy Directorate	414
Norsk institutt for forskning om oppvekst, velferd og aldring	NOVA-Norwegian Social Research	92
Europa programmet	Research and Development of Expertise in European Affairs	17
Vegdirektoratet, Vegteknisk avd.	Road Technology Department	100
SINTEF Oslo	SINTEF Oslo	
Statistisk Sentralbyrå	Statistics Norway	110
STEP Group	Studies in technology, innovation and economic policy	12
Mur- og betongsenteret	The Norwegian Institute for Masonry and Concrete Research and Information	6
Grafisk Institutt	The Norwegian Institute for the Graphic Arts Industries	17
Norsk språkråd	The Norwegian Language Council	18
Papirindustriens forskningsinstitutt	The Norwegian Pulp and Paper Research Institute	45

	Tine Norske meierier BA, senter for forskning og utvikling	Tine Norwegian Dairies BA	100
	Arbeidsforskningsinstituttet	Work Research Institute	49

There are 77 research institutes registered in the Oslo-Akershus region (there are approximately 127 in the whole of Norway)³² employing 7780 researchers. In Akershus there are 18 research institutes that employ 2803 researchers, the bulk working in the field of natural science and agriculture (1342) and in the field of technology (1170), suggesting vital milieus in these areas. In Oslo there are 28 institutes registered in social sciences, employing 1580 researchers. Natural sciences also dominates research activity in the capital area, with 1549 researchers registered in 7 research institutes.

Science parks in the Oslo and Akershus area

There are 3 science parks in the Oslo-Akershus region. Science parks contribute to creating milieus where technology diffusion and co-operation is likely. In science parks private businesses and universities, research centres and/or other institutions of higher education share the same physical premises. These parks are designed to encourage formation and growth of knowledge based industries and other organisations. The Research Park is often an important actor in the Science Park, and its purpose is to commercialise R&D results from research milieus. The Research Park's main objective is to be a mediator, to carry out strategic planning, counselling and project management.

Oslo Science Park - Oslo Research Park

Oslo Science Park represents around a third of Norway's total research resources. The Oslo Research Park is working to develop the Oslo Science Park into a significant research and innovation environment. The Science Park's players include the University of Oslo, The Norwegian Broadcasting Corporation, and The National Hospital of Norway among others. The Oslo Research Park houses industry firms, university and research institutes and newly established firms. The 'new' firms are located in the 'Innovation centre'. The Oslo Research Park houses 600 people in 70 different companies and institutions. The mission of the Research Park is to help commercially viable research results and project ideas develop into profitable enterprises. This is done on a sound commercial basis by being an active business development partner and by providing an environment for growth on suitable premises. Oslo Research Park provides all necessary assistance and facilities for new business enterprises, and can offer professional licensing and sales services for research-based ideas and results.

³² This figure does not include museums that do research.

There are 49 firms established in the Innovation Centre, of these 29 are in the area of information technology and multimedia, which are the dominant areas of activity in the research park. Other areas represented are; Pharmaceuticals (4 firms), Biotechnology (2 firms), Electronics and Materials (2 firms) and firms that function as consultants (8).

In 1985 the Oslo Research Park established a 'Forum for innovation' on the internet, aimed at reaching employees and students in the scientific community. The 'Forum for innovation' is meant to be a first alternative to cope with the demand for information on how to establish a firm, and gives practical support to entrepreneurs.

Table 17. Oslo Research Park- The Innovation Centre

Main area	Firms in The Innovation centre	Main product/field
Biotechnology	BioSoft AS:	develop aquacultural species
	AFFITECH AS:	produces and tests diagnostic tests
Bridge building, course activity and consultancy	Nitra AS	technology transfer to Japan
	BRA partner as	company development
	NSI konsult as (Norsk senter for informatikk konsult as)	course and seminars related to IT
	Novus Norge AS	consultancy
	VADCO International AS	business development
	Nokhart Management Consultants	business development
	NIGHT AS	interface between Japan and Norway of high technology
	SIVA	investment company
Electronics	Glace Technology AS	use of advanced electronics and computer techniques
Information Technology and Multimedia	DKG AS (Data Konsulent Gruppen AS)	scientific software
	Apertura as	software for the health industry
	Minard Development AS	software for logistic
	Technical Software Consultants AS (TSC)	software for simulation of reservoirs
	Mogul Media AS	multimedia solutions
	Linpro AS	operating system LINUX
	GNT International AS	information handling on the net
	WIT Web InfoTech AS	web-design
	Texcel AS	Standard generalised markings language
	CandleWeb AS	software for www
	NettOpp Norge AS	internet connections
	CSC Cosmo Scientific Consultant AS	software development
	Susar AS	Target adaptive matched illumination radar
	Mobile Business Systems AS	integration of IT and communication technology
	New Learning AS:	develops IT for distance learning
	NRK Interaktiv:	develops internet and media for NRK
	Network Security AS:	Data safety products
	QPIX AS	commercialise digital material
	Multimedica AS	commercialises teaching and development programs
	Maskot Interactive AS	develop services for internet
	Schibsted Interactive Studio AS	electronic publishing
	SRC	supplies IT solutions
	Inferno Nettverk A/S	internet security
	WebStudio AS	offers help for internet marketing
	Virtu AS	develops new media
	NC-Systems AS	network computing
	Næringsweb AS	web-design
	Net Solutions AS	internet software
	P4 Electric Farm	develop and run digital solutions for the net
	Materials	MOTECH-NPT/Norsk plasma teknologi
N/A.	NCNor AS	N/A.
Other research activity	Fundamendex AS	research and development related to of fundamental economic information
	Orinor AS	production of scientific journals
	NRK Forskning:	market research

Pharmaceuticals	SIGMA AS	supplier of pharmaceuticals
	Diatec AS	produces antistoffer*
	Diatherm AS	diagnostic methods
	Drug Discovery Laboratory AS (DDL)	identifies new pharmaceutical products

Table 18. Oslo Research Park – University/research institutes and industry firms

University/research institutes	Industryfirms
The Biotechnology centre in Oslo	Nycomed Pharma AS-FOU
Norwegian research council: Ethical committee	Pronova Biopolymer a.s.
National committee for research ethics for medicine	Taskon AS
Research Ethical Committee for Health Region I and 11 (REK 1 and 11)	
National Committee Research Ethical Committee for Social Sciences and Humaniora (NESH)	
National Committee Research Ethical Committee for Natural Science and Technology (NENT)	
Inst. For Graphic Arts Industry (GI)	
Infoteket	
Centre for studies in viking- and Nordic medieval age (middelaldersenteret)	
Norwegian Institute for Urban and Regional research (NIBR)	
Foundation for research in economics and business adm. (SNF)	
Centre for medical ethics (SME)	

Campus Kjeller – science park and innovation centre

There are 10 technological institutions in Kjeller, employing approximately 3000 persons. Campus Kjeller Ltd. was established to promote co-operation, innovation and business development based on technological expertise and available resources within research and education. It is owned by the research and educational institutions in Kjeller, by Skedsmo City Council and Akershus County Council. Campus Kjeller Ltd. promotes innovation based on ideas originating within the research institutions, by optimising conditions for establishing new businesses locally, and by offering professional assistance to those who see a commercial potential for their ideas. Campus Kjeller Ltd. is a bridging institution between R&D institutions and industry, and works to further develop educational programmes at Kjeller. Kjeller is a technology cluster, and cover research, development, higher education and consultancy over a wide range of technologies;

- ✓ Environmental Technology
- ✓ Energy Technology
- ✓ Defence and Aerospace Technology
- ✓ Telecommunication, Satellite Communication and Information Technology
- ✓ Radiopharmacy Electronics
- ✓ Industrial Mathematics, Modelling and Simulation

Table 19. Main actors and activities at Campus Kjeller.

<i>Higher education/R&D institutions</i>	<i>Industrial companies and Research centres</i>	<i>Projects and establishments</i>
Institute for Energy Technology-(IFE)	Kongsberg Defence and Aerospace	TELL AS (winPhone)
Norwegian institute for Air Research-(NILU)	Kværner Energy	Opera Software AS (internet browser)
Norwegian Defence Research Establishment (FFI)	Dyno	Instruments AS (nuclear hygrometer)
The Foundation of Higher Education at Kjeller (Høyskolestiftelsen)	Nycomed-Amershamn	Geminali AS (UV-meter)
Norwegian School of Management - BI Skedsmo	Telenor Research and Development	Infinity Innovations AS (virtual Reality/Visualisation)
Centre for Technology at Kjeller – UNIK: UniK is a foundation established in 1987 to take advantage of the resources available at the research institutes located at Kjeller. Today the members of the foundation are: The University of Oslo (UIO), the Norwegian University of Science and Technology (NTNU, previously NTH), the Norwegian Defence Research Establishment (FFI), the Institute for Energy Technology (IFE) and Telenor Research and Development (Telenor R&D).	Norwegian Seismic Array (NORSAR)	SciComp AS (fast volume visualisation of large datasets)
	Royal Norwegian Air Force Materials Command	Nordisk Energikontroll AS (autoselection of energy)
	Norwegian Metrology and Accreditation Service (Justervesenet)	Scanpower (reservoir simulator)
		InvestTech (automitised finance analyses)

Campus Ås - Ås Science Park

The Ås Science Park's primary purpose is to generate assets of business based on expertise from the research and education community in Ås (Campus Ås) together with businesses and public services. The Science Park offers administrative services such as project co-ordination, economic assistance and secretarial assistance in this process. The science park's main activities are in the field of commercialising R&D-projects by establishing companies or licensing, and assisting with consultancy and co-ordination of projects aimed at regional development in Norway. Ås Science Park administers funds and foundations, and houses entrepreneurial businesses. The Ås Science Park is one of the actors in Campus Ås. The Agricultural University of Norway is the main actor in Campus Ås, and owner of the premises. There are 6 research institutes in the Campus and a research centre. Major areas of expertise include:

- ◆ Agricultural and related Sciences
- ◆ Aquaculture (Fish farming)

- ◆ Environmental Science
- ◆ Forestry and Timber Industry
- ◆ Mapping and Land Use Planning
- ◆ Nutrition and Food Science

Table 20. Main actors and activity in Campus Ås

<i>Higher education/R&D institutions/ Research centres</i>	<i>Projects and establishments located in the Science park</i>
Agricultural University of Norway (NLH)	NLH- 'Atom Microscope' (microscopy)
Norwegian Crop Research Institute (Planteforsk)	5 private consultants
Norwegian Forest Research Institute (NISK)	Krister Bergknut - Consultant, (certifi- cation of laboratories)
Norwegian Institute of Land Inventory	
Institute of Aquaculture research Ltd.	
Norwegian Agricultural Research and Extension Groups (LFR)	
Jordforsk-Norwegian Centre for Soil and Environmental Research	
Secretariat for Nordic energy research	

The overview of the main actors and areas of expertise in the 3 science and research parks in the Oslo-region show that the parks have different areas of expertise, making them all important for creation and dissemination of knowledge in the region. Oslo has its focus on multimedia and information technology while Kjeller is dominated by defence, energy, telecommunication and environmental technology. Ås meanwhile is concentrated on the areas of agriculture, aquaculture, forestry and food sciences.

Business oriented guidance and counselling, technology and knowledge brokering and financial institutions

This section will try to map the knowledge providers that could function as important actors in the regional knowledge infrastructure located in the Oslo-region. Firstly we have made a list of institutions that provide indirect firm-level financing through a range of service organisations that provide subsidised services to firms. The sources of funding for these institutions are mainly the Ministry of Industry, Petroleum and Energy, as well as – to a certain degree – the Ministry of Foreign affairs (Norwegian Export Council)³³. The institutions mentioned provide business oriented guidance

³³ Parts of this section taken from Finn Ørstavik and Nils Henrik Solum "The Norwegian Innovation Policy System" draft note for the Norwegian Research Council, October 1997.

and counselling. They could also play a role as technology and knowledge brokers between firms and other firms or institutions that could be of help for firms.

The main goal of the following institutions is to aid the establishment of new firms and SMEs through guidance and counselling. Their functions vary from orientation about different policies to measures aimed at extending the competencies of the firms involved.

Table 21. Public business oriented guidance and counselling, technology and knowledge brokering, located in Oslo and Akershus. Source: NOU 23:1996 and Akershus county council.

<i>Business oriented guidance and counselling, technology and knowledge brokering, located in Oslo/Akershus</i>	<i>Function</i>
Institute of Technology (TI) incl. Norwegian Industry Attachés (NIS)	Administer a range of programs instigated by Norwegian research council, the SND, ministries and the EU. Is a private foundation, offer SMEs expertise to improve company know-how on productivity and profitability. Is coupled to NIS which offer assistance to make connections and transfer technology.
Consultancy services for business (BRT): Akershus Consultancy Services for Business Ltd. The Business Development centre at Follo The Business Development centre at Romerike The Business Development centre at Vøyenenga Akershus course and competence centre Consultancy Service for Business in Oslo at Næringsetaten	Targeted towards increasing financial and administrative capabilities of entrepreneurs and small firms (has not been granted money for 1999). In Akershus they also have established 3 business development centres, all publicly funded, that provide training, counselling and housing to all kinds of entrepreneurs and also established firms.
Oslo Business Region	Joint activity between the municipalities of Oslo and Akershus to provide assistance, services and information to foreign investors.
Norwegian Design Council	Promotes use of design in product development and marketing by use of information, seminars and counselling, some funding
Euro Info-offices	Are information offices directed towards SMEs, with information on the 'inner market' the 'European Economic Space' and other EU related questions.
Norwegian Export Council	Established to promote Norwegian export.
Council for business guidance	Co-ordinating the guidance and counselling activities with a small public funding
Oslo and Akershus division of Norwegian Industrial and Regional Development Fund (SND)	Public research- and development contracts (OFU). Industrial research and development contracts (IFU). Gives loans (see section on finance)
Norwegian State Guidance Office for Inventors (SVO)	Established to contribute to industrial innovation in Norway through counselling and financial support. Is a small public organisation set up to support inventors, offers advice and scholarships, supports patent applications and building of prototypes.

The institutions that can aid firms are many and diverse, divided according to type of activity and level of innovation efforts. This complex set of actors might be difficult for firms to access or understand, since they in many ways have overlapping responsibilities and are fragmented.

There are also several other organisations that can give firms information and guidance, like business and employers' organisations, professional organisations, trade unions and different kinds of membership organisations. We registered 873 such organisations in the Oslo-Akershus region.

Table 22. Overview of organisations located in Oslo and Akershus.

<i>Type of organisation</i>	<i>Number located in Oslo</i>	<i>Number located in Akershus</i>
Business and employers organisations (Nace 91110)	157	14
Professional organisation (Nace 91120)	97	6
Trade unions (Nace 91200)	236	11
Other membership organisations (Nace 91330)	284	68
Total number of organisations	774	99

Financial services: Venture- and investment companies in the Oslo-region

Financial services include banks, finance institutions, insurance, venture capital organisations etc. In Norway 570 financial institutions were registered in 1995, employing 53 000 persons (Aslesen, 1997)³⁴. Oslo has the largest share of firms within this sector, close to 30% . Akershus' share is close to 7%. The Oslo-region is looked upon as a 'natural' locational option for financial institutions; it is here that the financial milieu in Norway is centred.

In this section we are interested in getting an overview of venture capital organisations and investment organisations that provide venture capital to firms with a potential. These organisations are not large either in the amount of money they invest or in the share of companies they are involved in. Venture capital organisations are not only important for venture capital to new firms, their role as mediators and knowledge handlers is also very important. They are providers of competent venture capital.

There are no official listings of investment and venture capital firms in Norway. The list below is taken from a former foundation (Risikokapitalforeningen) and has been supplemented by SND and other central actors in this branch. This investigation has given a list of 25 companies located in the Oslo-region.

³⁴ Aslesen et al., 1997 "Struktur og dynamikk i kunnskapsbaserte næringer i Oslo". KS forskning.

Table 23. Venture- and investment companies in the Oslo-region³⁵.

Oslo-region	
Amerscan Partners	Møller Investor A/S
FOINCO Invest A/S	Navimar Holding A/S (Kloster Jr)
Oslo Research Park Ltd.	Nordic Merger AS
Ås Research Park Ltd.	Norgesinvestor AS
Four Seasons Venture AS	Norsk Vekst ASA
HARTOG A/S	NSV – Invest A/S
Hurd AS	Næringsinvest/Stormbull
Industri Kapital AS	SIVA
Industrifinans AS	SND Equity Capital Division and dept. for Entrepreneurship (nyskapning)
Industriinvestor ASA	Svensk Norsk Industrifond
Inge Stensland A/S	Teknoinvest Management AS
Investeringservice-Gruppen AS	Telenor Venture AS
Mallin AS	

The biggest actor in this market is the Norwegian Industrial and Regional Development Fund (SND). The science parks are among the actors with the lowest share of capital, they have different role than the established investment companies, and enter the firms in a very early stage. Some of these companies also have a large share of public funding, so it is hard to divide these companies into ‘private’ and ‘public’. In the next table, however, we have listed the organisations that provide public funding for businesses.

Table 24. Business oriented funding provided by public sources.

Administrator	Scheme
Oslo and Akershus division of Norwegian Industrial and Regional Development Fund (SND)	Administrational grants
	National risk loans
	Regional risk loans
	National warranties
	Regional warranties
	National grants
	Regional grants
	Establishment grant
Akershus county council	Risk loans and regional grants
GIEK	Export warranties
Exportfinans AS	Interest subsidies and currency securities

This section has given an overview of the large number of organisations that can function as a resource for business companies in the region, either by providing guidance and counselling, by providing general information, or by providing public or private funding. The ‘supply’ of business oriented organisations is vast, and it is

³⁵ Partly taken from Aslesen et al. (1997) *Struktur og dynamikk i kunnskapsbaserte næringer i Oslo*, Report R-10/1998, STEP Group, Oslo.

hard to sharply divide the organisations into different roles in relation to what they ‘supply’ to firms. We do not know to what degree these organisations ‘reach out’ to firms, especially not to SMEs, which often have few resources to network.

It is therefore important to have a business-oriented supply side that is surveyable. We do not know how well these business-oriented organisations manage to offer services that firms actually need, or how well their competence fits the business structure of the region. These are questions that need to be explored.

Consultancy sector that offer business services

The consultancy sector that offers business services is rapidly growing in the Oslo/Akershus region. This group of private companies and organisations represent an alternative to traditional knowledge providers in the public knowledge infrastructure. Knowledge is more than ‘scientific knowledge’ relating to technological innovation; innovation relevant knowledge originates from other sources than natural and technical science. Both public and private knowledge providers disseminate innovation relevant knowledge, drawn on different sources of knowledge.

In this section we look more closely at the service sector, namely the private consultancy firms. These companies have highly educated staff that provide intermediate services in the form of knowledge intensive solutions for customers (Erland Skogli, 1998)³⁶. These companies offer specialised business services to firms and may be important for firms in their innovation processes as well as diffusion agents for new technology. Consultancy companies that offer business services have come to play an important role both in terms of economic output and as knowledge and innovation mediators for the business environment, and are therefore seen as important actors in the knowledge infrastructure for firms. These companies provide technical, managerial and professional knowledge to their clients and include activities such as; business development, change management, leadership development, organisational development, process improvement and re-engineering, project management, retail management, and so on. Interactive networking between these suppliers and firms can initiate a mutual learning process which can in the end be transformed into applied business solutions for firms. In statistical terms we have defined the parts of the ‘consultancy’ sector of relevance to be;

- ◆ “Computer and related activities”: NACE 72
- ◆ “Other business activities”: NACE 74.1 and 74.2

In the whole of Norway 3577 consultancy firms are registered, of which 1201 are located in Oslo and 521 in Akershus. The region has close to half of the registered consultancy firms in Norway. This group of firms is heterogeneous, ranging from

³⁶ Skogli, Erland (1998), *Knowledge Intensive Business Services: A second National Knowledge Infrastructure*, Working paper A-03 1998, Step Group, Oslo.

software consultancy and accounting to legal activities. We choose therefore to look at subgroups such as hardware and software consultancy, business and management consultancy (Nace: 72100, 72200, 74140).

Table 25. Number of firms in selected Consultancy branches in Oslo and Akershus. Source: The Employment Register for 1996.

Consultancy branches/number of firms	Number of firms located in Oslo	Number of employees	Number of firms located in Akershus	Number of employees	Companies, rest of Norway
Hardware consultancy	22	58	10	69	21
Software consultancy and supply	294	3115	172	2303	411
Other IT consultancy		1560		1292	
Business and management consultancy activities	319	932	178	707	550
Total	635	5665	360	3741	982

Table 25 shows that about half of all IT and business consultancy companies are located in Oslo and Akershus, and that the industries employ more than 8 300 persons.

Summary

Oslo and Akershus contained more than 37% of the country's registered students in 1996. The University of Oslo, Oslo College and the Norwegian School of Business Administration are the main actors. The region has higher shares attending Universities and Colleges than is the average for Norway. Oslo and Akershus have more than 60% of the country's research institutes, employing 7780 researchers. The main research areas are the fields of natural science (34.3% of the researchers), technology (22.5% of the researchers) and social science (21.5% of the researchers).

The 3 research parks in the region have their main activities in different fields. The Oslo Research Park is dominated by multimedia and information technology firms, Kjeller by technology, and Ås by agriculture, aquaculture and food science.

In the Oslo-region there are different public organisations oriented towards businesses. These organisations provide counselling and financing, which studies show are important for firms' innovation³⁷. There are also several other kinds of organisations that could be important for businesses, like business and employer's organisations and different professional organisations. There are several such organisations in the region; we do not know, however, what kind of support they

³⁷ Wiig, H. and M. Wood (1995), *What comprises the regional innovation system*, Report 1-95, Step Group, Oslo.

could offer the firms. Several financial institutions that provide competent venture capital are located in the region, and can be important partners for knowledge intensive industries in the region.

The region has close to half the registered consultancy firms in Norway, suggesting a good supply of technical, managerial and professional knowledge to firms in the region.

The region has a very large proportion of the countries' 'suppliers of knowledge'. What we do not know is to what degree firms in the region actually use the different suppliers or how well the scope and quality of local sources fit the firms' needs.

Appendix 1: Available datasets

Norwegian Employment Register

Norwegian Employment Register is a dataset with information about employees and companies in Norway. The set cover all companies and employees in the Oslo region in the period 1986-1996. The main variables in the set is in which company the employees work, the specific industry of the company (5-digit NACE code), the company size (in number of employees), the community and country which the employee lives and his or her highest education. The dataset can be used to illuminate employment in different sectors within a particular geographical area, as the Oslo region. It is possible to use the data to create 'knowledge profiles' by looking at share of employees with different education types and length in e.g. industries, over company sizes or in different regions. The collection and gathering of data is co-ordinated by National Bureau of Statistics.

CoTech database

CoTech (Co-operation on Technological development) is a database which contains in-depth information from interviews on innovation and technology co-operation in approximately 1.000 Norwegian companies, in all sectors, company sizes and regions. The database cover about 60 companies in the Oslo region, and was collected in 1998. The database covers variables as, among others, direction and extent of innovation, technological co-operation, number of partners, types of partners and types of co-operation. The data is collected by STEP-group.

The CIS database

The CIS database contains information about innovation, R&D and economic performance on about 3.000 Norwegian companies, of which appr. 800 is located in the Oslo region. The set covers all sectors and company sizes, and was collected in 1997. More specifically, the dataset provides information on company level about innovation expenditures, changes in products, process or organisation, profits from innovation, innovation sources, R&D expenditures etc. The data is collected simultaneously in all EU and EEA countries, in Norway by National Bureau of Statistics.

National Manufacturing Statistics

Contain main figures about manufacturing industries, as found in publications from National Bureau of Statistics. The publications contain information about turnover, value added, employment, industrial structure and company size for all companies with more than 9 employees in the Oslo region. The statistics are collected yearly.

National Services Statistics

Contain main figures about most business services, as found in publications from National Bureau of Statistics. The publications contain information about turnover, value added, employment, industrial structure and company size on regional level.

Norwegian Research and Development Database

Statistics on R&D in Norwegian enterprises, gathered biannually by National Bureau of Statistics. Data cover activities for *all* firms with 50+ employees (in 1995: 2.557 companies) and *randomly picked* 2.820 companies with less than 50 employees.

University and college R&D

Information on R&D performed in Norwegian universities, colleges and R&D institutes. Data gathered biannually through questionnaires to R&D-performing institutions, by Norwegian Institute for Studies on Research and Education

Regional Input-Output data

Regional (county) data from National Account Statistics cover flows of goods and services by industry.

Appendix 2: Corresponding industries in ISIC and NACE classification systems

<i>ISIC (pre 1993)</i>	<i>Text</i>	<i>NACE (from 1993)</i>	<i>Text</i>
311/2 + 313/4	Food + beverages and tobacco	15+16	Food and beverages
321 + 322 + 323	Textiles + clothing (except footwear) + leather and furs	17+18+19	Clothing and leather products
331 + 332	Wood products (except furniture) + furniture's	20	Wood products
341	Pulp and paper	21	Pulp and paper
342	Printing and publishing	22	Printing and publishing
354	Petroleum and coal products	23	Coal and petroleum products
351+352	Chemicals + chemical products	24	Chemicals
355 + 356	Rubber products + plastics	25	Rubber and plastics
361+362+369	Ceramics+ glass and glass products + other mineral products	6	Mineral products
371+372	Iron and steel + non-iron metals	27	Metals
381	Metal products	28	Metal components
382	Machinery	29	Machines and equipment
383 + 385	Electric goods + technical, scientific and optical goods	30+31+32+33	Electrical and optical instruments
384	Transport	34+35	Transport
390	Other	36+37	Other

Appendix 3: Extended bibliography

The following pages bring a detailed list of publication concerning the Oslo region. The publication is presented by year of publication (reverse order; last published reports are placed first).

Id.	Forfatter(e)	Utgivelsesår	Tittel
1	Bjørnsen, Hild-Marte og Johansen, Steinar	1998	Regional utviling på Østlandet.
	Institusjon NIBR		Tidsskrifttittel Prosjektrapport 25/1998
	Beskrivelse Gjennomgang av den historiske befolknings- og sysselsettingsutviklingen for Østlandet og framskriving av mulig utvikling framover, ved bruk av PANDA; en plan- og analysemodell for næringsliv, demografi og arbeidsmarked.		
	Engelsk beskrivelse Analysis of population and employment for Eastern Norway, with historical trends and 3 scenarios for possible trends in the future. Uses a statistical prediction model, and concludes that in any of the analysed cases, the Oslo-region will grow strongly.		
2	Halvorsen, Knut	1998	Næringslivsrådet for Oslo og Akershus: Evaluering av fase 1 og forslag til organisering av fase 2.
	Institusjon NIBR		Tidsskrifttittel Notat 101/1998
	Beskrivelse Næringslivsrådet for Oslo og Akershus ble etablert i 1995 for å styrke forbindelsene mellom kommuneforvaltning og næringsliv, og for å forbedre rammebetingelsene for næringslivet i Oslo og Akershus. Evalueringen er positiv og anbefaler oppfølging.		
	Engelsk beskrivelse "Næringslivsrådet for Oslo og Akershus" was established in 1995 as a new public agency designed to strengthen the links between local government and business in the Oslo region. The evaluation is positive, and continued efforts are recommended.		
3	Aslesen, Heidi Wiig, m. fl.	1998	Struktur og dynamikk i kunnskapsbaserte næringer i Oslo
	Institusjon STEP		Tidsskrifttittel Rapport R-10/1998
	Beskrivelse Drøfter situasjonen for og utviklingstendensene i kunnskapsbaserte næringer i Oslo. Det gis en oversikt over utviklingsmekanismer, og det trekkes opp perspektiver i forhold til hvilke rolle Oslo Kommune kan ta som framtidig næringspolitisk aktør.		
	Engelsk beskrivelse Analysis of the situation for and development trends within knowledge based industries in Oslo. An overview of development mechanisms is provided, and perspectives are drawn up for the potential policy role of Oslo Kommune in the future.		
4	Solum, Nils Henrik	1998	R&D-activity in Oslo: A presentation of some central R&D data.
	Institusjon STEP		Tidsskrifttittel Working Paper A-08/1998
	Beskrivelse Rapporten referer tall for FoU aktivitet blant bedrifter i Oslo. Statistikk fra SSB's FoU-undersøkelse fra 1995 presenteres, og kobles med tall fra sysselsettingsregistre og andre offentlige databaser.		
	Engelsk beskrivelse This paper maps the R&D activity among firms in the Oslo region. The report uses R&D statistics from the Statistics Norway R&D survey from 1995, and data from the employment register and also other data on firms.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
5	Ørstavik, Finn	1998	Innovation regimes and trajectories in goods transport.
	Institusjon STEP		Tidsskrifttittel Report R-09/1998
	Beskrivelse Rapporten beskriver den veibaserte godstransportnæringen, og analyserer innovasjon som foregår i bransjen, og hvordan bransjen kan medvirke til innovasjon i andre bransjer. Oslo er det dominerende sentrum ("hub") for denne næringen i Norge.		
	Engelsk beskrivelse The report describes the roadtransport of goods in Norway, and analyses innovation taking place in the industry. It also focuses on how innovation in this industry can contribute to innovation in other industries. Oslo is the key transport hub in Norway.		
6	Agenda utredning og utvikling	1997	Delutredning 6: Oslo i ulike regionale sammenhenger as
	Institusjon Agenda Utredning og Utvikling AS		Tidsskrifttittel Fjordby eller havneby? Utredning.
	Beskrivelse Delutredning til utredningen "Fjordby eller havneby".		
	Engelsk beskrivelse One of the underlying studies for the "Fjordby eller havneby" report.		
7	Aure, Otto Arne	1997	Forskningsparken i Oslo: en studie av hvilke målvariable ...
	Institusjon BI		Tidsskrifttittel Diplomoppgave
	Beskrivelse Utredning av hvilken målvariable en kan/bør basere seg på av en evaluering av virksomheten til Forskningsparken i Gaustadbekkdalen i Oslo.		
	Engelsk beskrivelse A discussion of what goal variables should be utilised in an evaluation of the activities of Forskningsparken in Oslo.		
8	Kirkeng, Kristine og Ørbeck, Birgitte	1997	Kvinnelige entreprenører i Oslo og Akershus
	Institusjon BI		Tidsskrifttittel Diplomoppgave siviløkonomstudiet
	Beskrivelse Undersøkelse basert på intervju med 16 kvinnelige entreprenører i Oslo og Akershus. Fokus på kvinnenes bakgrunn; deres motiver; barrierer mot oppstart og i daglig drift; type virksomhet kvinner starter; sammenligning av kvinnelige/mannlige entreprenører.		
	Engelsk beskrivelse Study based on interviews with 16 female entrepreneurs in small businesses in Oslo and Akershus. Focus on their background, motives, barriers, type of activities, and comparison of male and female entrepreneurs.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
9	ECON	1997	Delrapport 4: Havnas betydning for næringsvirksomheten i Oslo

Institusjon
ECON

Beskrivelse

Underlagsrapport for utredningen "Fjordby eller havneby".

Tidsskrifttittel

Fjordby eller havneby? Utredning.

Engelsk beskrivelse

Underlying study for the "Fjordby eller havneby" report.

Id.	Forfatter(e)	Utgivelsesår	Tittel
10	Ukjent	1997	Om distrikts- og regionalpolitikken

Institusjon
KAD

Beskrivelse

Stortingsmelding som vektlegger at Regjeringen holder fast på distriktspolitiske hovedmål om bl. a. bevaring av bosettingsmønstre og støtte til perifere strøk. Tar opp spørsmål om rollefordeling og komplementaritet by/land, men drøfter ikke byenes rolle.

Tidsskrifttittel

Stortingsmelding 31 1996/97

Engelsk beskrivelse

Report that emphasise main objectives for regional policies, i.e. maintaining current population patterns and support to peripheral areas, are unchanged. Mentions the complementary relationship between rural and urban areas; role of cities not analysed.

Id.	Forfatter(e)	Utgivelsesår	Tittel
11	Johansen, Steinar	1997	Oslo havns rolle i samfunnet: underlag for strategisk havneplan fram mot år 2020

Institusjon
NIBR

Beskrivelse

Tidsskrifttittel

Prosjektrapport

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
12	Johansen, Tor Are	1997	Fra bly til bytes: Oslo grafiske fagforening 1872-1997

Institusjon
Oslo grafiske fagforening

Beskrivelse

Tidsskrifttittel

Fagforeningshistorie

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
13	Plan- og bygningsetaten	1997	Fjordby eller havneby?
	Institusjon Oslo Kommune, Plan og Bygningsetaten		Tidsskrifttittel Utredning om Oslos havne- og sjøside
	Beskrivelse Rapporten vurderer positive og negative konsekvenser av å omgjøre store arealer langs Oslos sjøside til bolig- og rekreasjonsområder. Spesielt vurderes miljømessige og næringsmessige konsekvenser av å flytte Oslos havnevirksomhet bort fra byen.		
	Engelsk beskrivelse Summaries the results of several analyses focusing on positive and negative effects of transforming areas on the central seaside of Oslo into living- and recreation areas, and of moving the commercial harbour out of (the center of) Oslo.		
14	Isaksen, Arne og Spilling, Olav	1996	Regional utviling og små bedrifter.
	Institusjon Høyskoleforlaget.		Tidsskrifttittel ISBN: 82-7634-047-4
	Beskrivelse En bred oversikt over den regionale næringsutviklingen i Norge, en analyse av dynamiske prosesser og SMBs rolle i disse. Situasjonen i ulike næringer og regioner sammenlignes. Oslo-regionens situasjon belyses i et komparativt perspektiv.		
	Engelsk beskrivelse A broad overview over regional industrial development in Norway, an analysis of dynamic processes and the role of SMBs in these. The situation in different industries and regions are compared, among them is the Oslo-region.		
15	Halvorsen, Knut	1996	Hva kan vi lære av Montpellier? En komparativ studie av det næringspolitiske arbeidet i Montpellier og Oslo-regionen.
	Institusjon NIBR		Tidsskrifttittel Rapport 2/1996
	Beskrivelse Underlagsrapporten for modul D i prosjektet "Næringslivets utviklingspotensialer i Oslo-regionen". Fokuserer på hva som er blitt gjort i det næringspolitiske vellykkede Montpellier og Languedoc-Roussillon og hvilke tiltak som kunne anvendes i Oslo.		
	Engelsk beskrivelse Base report for module D in the project "Næringslivets utviklingspotensialer i Oslo-regionen". Focus on the successful Montpellier and Languedoc-Roussillon region, and analysis of what policy initiatives which could be adopted in the Oslo-region.		
16	Halvorsen, Knut	1996	Næringslivets utvilingspotensialer i Oslo-regionen. Modul D: Modeller for styrket samspill mellom FoU og næringsliv
	Institusjon NIBR		Tidsskrifttittel Notat 101/1996
	Beskrivelse En syntetiserende framstilling av innholdet i MontPELLIERRAPPORTEN. Legger vekt på at kobling av FoU og næringsliv ved kommunal og fylkeskommunal medvirkning er viktig for suksess, og foreslår at det opprettes et inter- og fylkeskommunalt næringssselskap.		
	Engelsk beskrivelse A synthetic exposition of the main results fo the Montellier report. Emphasised that coupling of R&D and business through the active involvement of public policy agencies can be an important success factor, and makes proposal for a new agency in Oslo.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
17	Halvorsen, Knut (red.)	1996	Næringslivets utviklingspotensialer i Oslo-regionen: Sluttrapport.

Institusjon

NIBR

Beskrivelse

Rapporten oppsummerer resultatene fra bransjestudier

Tidsskrifttittel

Rapport 1/1996

Engelsk beskrivelse

The report summarises the results from the industry-studies.

Id.	Forfatter(e)	Utgivelsesår	Tittel
18	Johnstad, Tom	1996	Næringslivets utviklingspotensialer i Oslo-regionen. Modul C: Oslo-regionens økonomiske og funksjonelle rolle

Institusjon

NIBR

Beskrivelse

Rapporten vurderer Oslo-regionens økonomiske og funksjonelle rolle, særlig i forhold til resten av Østlandet. Det anlegges et verdikjedeperspektiv (Porter) og det konkluderes med samarbeid og nettverksbygging er avgjørende for positiv utvikling framover

Tidsskrifttittel

Notat 103/1996

Engelsk beskrivelse

The report evaluates the economic role of the Oslo-region, in particular with respect to the rest of Eastern Norway. A value chain perspective is employed, and among the conclusions is that networkbuilding and collaboration are crucial for growth.

Id.	Forfatter(e)	Utgivelsesår	Tittel
19	Øien, Kjell Arne	1996	Næringsutviklingsproblemer i Oslo indre øst.

Institusjon

NMH

Beskrivelse

En kvalitativ studie av næringsutviklingsproblemer i Oslo indre øst. Næringsutvikling slik den ble forstått av folk i næringslivet sammenlignes med næringsutviklingspolitiske virkemidler på kommunalt nivå, og er funnet at virkemidlene er inadekvate.

Tidsskrifttittel

Sivilmarkedsføreroppgave

Engelsk beskrivelse

A qualitative study of industry development problems in the eastern part of the centre of Oslo. The problem of industry development among businessmen is compared to actual policy measures, and measures are found to be grossly inadequate.

Id.	Forfatter(e)	Utgivelsesår	Tittel
20	Grønvold, Frode	1996	Lokala næringsutvikling: En antropologisk studie av bydel 5 i Oslo.

Institusjon

Norges Markedshøyskole

Beskrivelse

En antropologisk inspirert studie av entreprenørskap og næringsutvikling i bydel 5 i Oslo. Entreprenørskap hemmes av manglende forståelse for entreprenørkultur, svake nettverk, lite samarbeid og mangelfull kommunikasjon mellom aktørene.

Tidsskrifttittel

Temaoppgave sivilmarkedsførerstudiet

Engelsk beskrivelse

An anthropological study of entrepreneurship and industry development in Günerløkka/Torshov in Oslo. The conclusion is that there is a lack of entrepreneurial spirit, weak networks and lacking communication between actors.

Id.	Forfatter(e)	Utgivelsesår	Tittel
21	Konferansereferat	1996	Fremtidens Fornebu: Idé-konferanse 13.12.96

Institusjon
Norske sivilingeniørers forening
Beskrivelse

Tidsskrifttittel
Konferanserapport

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
22	Engebreetsen, Øystein	1996	Lokalisering, tilgjengelighet og arbeidsreiser. ...

Institusjon
TØI
Beskrivelse

Tidsskrifttittel
Notat

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
23	Røgeberg, Marianne	1996	IT-næringen i Oslo-området: en studie av konkurransevne og utviklingspotensialer i lys av evolusjonær og institusjonell teori.

Institusjon
UiO
Beskrivelse

Tidsskrifttittel
Hovedoppgave i Samfunnsgeografi

Opgaven drøfter vilkårene for vekst i IT-næringen i Osloområdet, og hva som er positive og negative faktorer som kan ha størst betydning for bransjen framover. Fokus er på kunnskapsproduksjon, og institusjonell og evolusjonær teori anvendes.

Engelsk beskrivelse

The thesis analyse the conditions for growth in the IT-industry in Oslo, and single out positive and negative factors that could impact on the business in the future. Focus on knowledge production. Analysis based on institutional and evolutionary theory.

Id.	Forfatter(e)	Utgivelsesår	Tittel
24	Ukjent	1995	Framtiden for Akershus/Oslo-landbruket

Institusjon
Fylkeslandburkskontoret i Oslo/Akershus
Beskrivelse

Tidsskrifttittel

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
25	Fosmark, Hild og Johnstad, Tom	1995	IT-industrien i Oslo-regionen
	Institusjon NIBR		Tidsskrifttittel Notat
	Beskrivelse "Porter-analyse" av IKT-industrien i Osloområdet, basert på intervju med utvalgte informanter og analyse av tilgjengelig statistikk om industrien. Anbefalinger bl.a. om økt koordinering mellom FoU-miljøer, og økt samarbeid mellom forskning og industri.		
	Engelsk beskrivelse Porter-inspired analysis of the ICT-industry in the Oslo region. Data from interviews with selected individuals and statistical analysis. Recommends increased coordination of R&D institutions and increased business-research collaboration.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
26	Johansen, Steinar og Johnstad, Tom	1995	Oslo-Göteborg regionen: Infrastruktur og utvikling
	Institusjon NIBR		Tidsskrifttittel Notat 111/1995
	Beskrivelse Vurderer virkningen av forbedret infrastruktur på vei og jernbane på samarbeid og samspill mellom Oslo-regionen/Østfold og Göteborg-regionen (Vest-Sverige). En har sett på 3 scenarier der utbygging av infrastruktur gir ulike effekter.		
	Engelsk beskrivelse Evaluates the effects of improved road and railway infrastructure on collaboration and growth in joint activities between in what is called the "Oslo-Gothenburg region." 3 development scenarios for infrastructure are considered.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
27	Johnstad, Tom	1995	Næringslivets utviklingspotensialer i Oslo-regionen: Modul B: Sluttrapport fra bransjeanalysen
	Institusjon NIBR		Tidsskrifttittel Notat 129/1995
	Beskrivelse Kortversjon av NIBR rapport 14/1995 som sammenfatter resultatene av bransjestudiene foretatt innenfor prosjektet "Næringslivets utviklingspotensialer i Oslo-Regionen". Inneholder sammendrag av bransjestudiene, og anbefalinger for bedret konkurranseevne.		
	Engelsk beskrivelse Short version of report 14/1995 that summarises the result of industry studies which were undertaken within the project "Næringslivets utviklingspotensialer i Oslo-regionen". Also contains the main recommendations for future policy initiatives.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
28	Johnstad, Tom og Fosmark, Hild	1995	Det mediaindustrielle kompleks
	Institusjon NIBR		Tidsskrifttittel Notat 123/1995
	Beskrivelse En analyse av grafisk og annen mediarelatert industri som har en hovedtyngde av sin virksomhet her landet i Osloregionen. Ut fra Porters modell påpekes svake og sterke sider av mediaindustrien i Osloområdet, og forslag til endringer fremsettes.		
	Engelsk beskrivelse Analysis of printing and other mediarelated industries which have a stronghold in the Oslo-region. With reference to the Porter-model, strong and weak aspects of the industry is analysed, and proposals for improvements are made.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
29	Johnstad, Tom og Fosmark, Hild	1995	Det helseindustrielle miljø i Oslo-regionen
	Institusjon NIBR		Tidsskrifttittel Notat 124/1995
	Beskrivelse En analyse av helseindustri i Osloregionen, med fokus på legemidler og medisinsk utstyr. Med utgangspunkt i Portermodellen diskuteres faktorforhold, etterspørsel, konkurranseforhold, rammevilkår og relatert virksomhet. Forbedringsmuligheter vurderes.		
	Engelsk beskrivelse Analysis of health related industries in the Oslo-region. Focus on pharmaceuticals and medical equipment. With basis in the Porter-model, the key conditions for competitiveness is analysed, and policy options for improvements are evaluated.		
30	Kann, Frode og Halvorsen, Knut	1995	Næringslivets utviklingspotensialer i Oslo-regionen: Modul A: Strukturanalysen
	Institusjon NIBR		Tidsskrifttittel Notat 105/1995
	Beskrivelse Beskrivelse av næringsmessige endringer i Oslo og Akershus siden begynnelsen av 1980-tallet og fram til 1995. Presentasjon av tall for sysselsetting, bearbeidingsverdi, omseting og antall bedrifter på bransje- og underregionalt nivå (Akershus).		
	Engelsk beskrivelse Description of structural changes in the Oslo-region since the early 1980ies until 1995. Presents statistics for employment, value added, turnover and firm populations.		
31	Kleven, Kjersti	1995	Energiteknologisk industri i Oslo-regionen
	Institusjon NIBR		Tidsskrifttittel Notat 126/1995
	Beskrivelse Rapporten belyser situasjonen til den energiteknologiske industri i Osloregionen gjennom en studie av 3 utvalgte bedrifter. Særlige utfordringer påpekes, og det gis råd om hva som bør gjøres for å øke verdiskapningen og konkurranseevnen i bransjen.		
	Engelsk beskrivelse The report highlights the situation for energy related technological industry in the Osloregion. The study focuses on 3 cases, but also gives information appartaining to the industry in general. The strucure is evaluated, options for improvements noted.		
32	Kleven, Kjersti	1995	Det maritime miljø i Oslo-regionen
	Institusjon NIBR		Tidsskrifttittel Notat 125/1995
	Beskrivelse "Porter-studie" av sjøfartsrelatert virksomhet i Oslo og Akershus. Næringsens hovedfunksjoner er spredt over landet; rederier og servicefunksjoner finnes i Oslo. Utfordringer knyttes til samarbeid med andre bransjer, og til FoU-institusjoner.		
	Engelsk beskrivelse Porter-inspired study on maritime activities in Oslo-region. The maritime cluster has its main functional elements spread around Norway; shipowners and services are located in Oslo. Main challenge is to connect with other industries and R&D institutions.		

Id. 33	Forfatter(e) Onsager, Knut	Utgivelsesår 1995	Tittel Det matindustrielle miljø i Oslo-regionen
	Institusjon NIBR		Tidsskrifttittel Notat 118/1995
	Beskrivelse Porter-inspirert studie av det næringsmiddelindustrien i Oslo-regionen, som er stor og nasjonalt ledende. Den er preget av solide tradisjoner og flere store bedrifter. Internasjonalisering og nye krav til spesialisert kompetanse er viktige utfordringer.		
	Engelsk beskrivelse Porter-inspired study of the food-industry in the Oslo-region, which is large and leading in Norway. It is marked by solid traditions and several large firms. Challenges related to internationalisation and building of specialised competences.		
Id. 34	Forfatter(e) Onsager, Knut og Orderud, Geir I.	Utgivelsesår 1995	Tittel Varehandel i Oslo-regionen
	Institusjon NIBR		Tidsskrifttittel Notat 119/1995
	Beskrivelse Analyserer varehandelbransjen i Oslo i Porterperspektiv. Oslo er et nav i det norske distribusjonssystemet, og bransjen er sterk. Samarbeid og kjedebygging har gitt detaljister og grossister mer makt. Internasjonalisering er en stor utfordring.		
	Engelsk beskrivelse A (Porter) analysis of the retailing industry. Oslo is the central hub in the norwegian retailing system. Industry transformed by collaboration and chain-building, which as empowered retailes and wholesalers. Internationalisation is a key challenge.		
Id. 35	Forfatter(e) Johannessen, Petter	Utgivelsesår 1995	Tittel Prosjekt Oslo Indre Øst: Lokal næringsutvikling i et område av en storby.
	Institusjon NMH		Tidsskrifttittel Temaoppgave sivilmarkedsførerstudiet
	Beskrivelse Rapport fra Prosjekt Oslo Indre Øst, etablert i et samarb. BI/Oslo Kom. Analyserer handelsstandens situasjon og fremtidsmuligheter. Prøver å kartlegge holdningsmessige og strukturelle trekk, og foreslår tiltak som kan bidra til positiv utvikling.		
	Engelsk beskrivelse Report from project on eastern-central parts of Oslo. Attempts to map outlooks and attitudes among local businessmen, analyses the situation of local business and proposes policy actions that should contribute to a improvements.		
Id. 36	Forfatter(e) Kvadsheim, H. og Farsund, A.	Utgivelsesår 1995	Tittel Porter-inspirerte næringslivsstudier i storbyregionene - motefenomen eller effektivt handlingsinstrument?
	Institusjon Rogalandforskning		Tidsskrifttittel Rapport 188/1995
	Beskrivelse En komparativ analyse av seks Porter-inspirerte næringslivsstudier i de 4 storbyregionene i Norge. Hovedkonklusjonen er at studiene særlig har vært et mobiliseringsgrunnlag i næringspolitiske prosesser, men ikke har vært viktig grunnlag for beslutninger.		
	Engelsk beskrivelse A komparative study of six Porter-inspired studies in the 4 large city regions in Norway. Main conclusion is that the studies have been useful to mobilise policy processes, but that they have been unable to generate a valid fundament for decisionmaking.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
37	Hodgson, B. and Lacave, M.	1995	Oslo Research Park Evaluation Study. Final report.

Institusjon
Segal Quince Wicksteed Ltd. Canbr. and IS

Beskrivelse

Tidsskrifttittel

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
38	Rasmussen, Tor Fredrik	1994	Structural changes and transformation in the economy and manufacturing industries of the Oslo region.

Institusjon

Beskrivelse

Tidsskrifttittel

Artikkel i Vandermotten, Christian

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
39	Hagen, Djuve og Vogt	1994	Oslo, den delte byen

Institusjon

FAFO

Beskrivelse

En bredt anlagt levekårsundersøkelse for Oslo basert på en intervjuundersøkelse gjennomført i 1993. En detaljert og grundig problemanalyse, men gir ikke mange svar på hva som kan gjøres med problemene. Næringspolitiske problemstillinger berøres ikke.

Tidsskrifttittel

Rapport 161/1994

Engelsk beskrivelse

A broad study of living conditions in Oslo, based on an interview survey carried through in 1993. A detailed and thorough problem analysis, but few policy recommendations, and no discussion of issues concerning local industry and business development.

Id.	Forfatter(e)	Utgivelsesår	Tittel
40	Benum, E.	1994	Byråkratienes by. Fra 1948 til våre dager.

Institusjon

J. W. Cappelens forlag, Oslo.

Beskrivelse

En bred gjennomgang av Oslo bys historie etter krigen.

Tidsskrifttittel

Oslo bys historie, bind 5.

Engelsk beskrivelse

A broad analysis of the history of Oslo after World War II.

Id.	Forfatter(e)	Utgivelsesår	Tittel
41	Haukeland, K. og Sørbrøden, Ø.1994		Næringsutviling i Oslo og Akershus. Felles næringslivsråd.
	Institusjon Norsk Regional Utvikling (?) Beskrivelse		Tidsskrifttittel
	Engelsk beskrivelse		
42	Osland, Joranger, Rusten, Sjøholt, Vatne	1994	Næringsutviling og lokaliseringsadferd i storbyregioner.
	Institusjon Næringsøkonomisk Institutt Beskrivelse		Tidsskrifttittel Rapport 128/1994
	Rapporten fra "Hurumprosjektet" (med Miljøverndep. som oppdragsgiver) drøfter teoretisk problemstillinger knyttet til næringsutvikling og lokaliseringsadferd. NØI rapport 129 er den empiriske delrapporten fra samme prosjekt (se beskrivelse av denne).		
	Engelsk beskrivelse Report from the "Hurum-project" (sponsored by the Minsistry for environment) which analyse theoretically industrial development and localisation. NØI report 129 is the empirical companion volume for this report.		
43	Haanes, E. O.	1994	Veien ut av Oslo er brolagt med distriktspolitiske virkemidler.
	Institusjon Osloforskningen Beskrivelse		Tidsskrifttittel Rapport
	Engelsk beskrivelse		
44	Ukjent	1994	Service- og senterstrategi for Oslo 1994 - et høringsforslag
	Institusjon Plan- og bygningsetaten Oslo Kommune Beskrivelse		Tidsskrifttittel Høringsforslag
	Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
45	Ekeland, Anders	1994	Forskningsmobilitet i næringslivet i 1992.
	Institusjon STEP-gruppen, Oslo		Tidsskrifttittel Rapport 5/1994
	Beskrivelse Analyse av offentlige registerdata for å klarlegge mobilitet av forskere i næringslivet. En konkluderer at mobilitet innad i FoU systemet og innad i næringslivet er nokså lik, mens det er svært liten mobilitet mellom næringsliv og FoU institusjoner.		
	Engelsk beskrivelse An analysis of public register data in order to estimate the mobility of researchers in business. A conclusion is that there is little mobility between R&D and industries, and higher and similar mobility within the sectors.		
46	Kiese, Hild Fosmark	1994	Grafisk virksomhet i Oslo: En samfunnsgeografisk studie.
	Institusjon UiO		Tidsskrifttittel Hovedoppgave i Samfunnsgeografi
	Beskrivelse Oppgaven søker å avdekke sammenhengene mellom teknisk endring, produsksjonsorganisering og -lokalisering i grafisk virksomhet i Oslo. Hva gjør Oslo til et egnet sted for slik virksomhet, og hva vil virkningen være av innføring av ny teknologi?		
	Engelsk beskrivelse The thesis attempts to clarify the causal relationships between technical change, the organisation of production and localisation of graphical industry in Oslo. Why is Oslo a suitable place for firms in this industry, and what will the effects of IT be?		
47	Vendermotten, Christian	1994	Planification et strategies de developpement dans les capitales Europeennes.
	Institusjon Universite de Bruxelles		Tidsskrifttittel Editions de l'ULB
	Beskrivelse		
	Engelsk beskrivelse		
48	Ukjent	1993	Om en strategi for næringsutvikling i Oslo
	Institusjon Byrådet Oslo Kommune		Tidsskrifttittel Bystyremelding 1/1993
	Beskrivelse		
	Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
49	Berg, I. D., Solberg, C. A. og Veie, E.	1993	Norsk IT-næring mot år 2000. Barrierer og vekstfaktorer for norsk IT-næring.

Institusjon
NiM, Sandvika

Tidsskrifttittel
Forskningsrapport 13/93

Beskrivelse

Rapporten vurderer strukturen i IT-næringen og beskriver hva slags firmaer bransjen består av. En vurderer vekstmulighetene, og spesifiserer det en mener er viktige vekstfaktorer og barrierer for vekst i bransjen. Videre vurderes myndighetenes rolle.

Engelsk beskrivelse

Analysis of the structure of the IT-industry and of the firms that it is made up of. Growth possibilities are evaluated, growth factors and inhibitors are pointed out. Furthermore discusses the role of government and industry policy.

Id.	Forfatter(e)	Utgivelsesår	Tittel
50	Andreassen, Tor Wallin og Øijord, Asbjørn	1993	Markedsorientert næringspolitikk i Oslo Kommune 2. utg.

Institusjon
Norsk institutt for markedsforskning - BI

Tidsskrifttittel
NIM rapport 12/92

Beskrivelse

Rapporten analyserer Oslo Kommune som tjenesteyter i forhold til næringslivet. Byråkratiske likebehandling gir dårlig service for et heterogent næringsliv, og intervjuede næringslivsledere har stor mistillitt til kommunen.

Engelsk beskrivelse

The report discusses the role of Oslo Kommune as a service provider for industry and business. The conclusion is that bureaucratic principles matches badly with the need to be specific in the response to needs, and there is widespread mistrust to O.K.

Id.	Forfatter(e)	Utgivelsesår	Tittel
51	Vittersø, Gunnar	1992	Sysselsetting for Oslo, Akershus og hele landet 1972-1992

Institusjon

Tidsskrifttittel
Oslostatistikken

Beskrivelse

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
52	Ukjent	1992	Storbyenes rolle i norsk næringsutvikling.

Institusjon
Asplan Analyse Storbyforskningsprogram

Tidsskrifttittel

Beskrivelse

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
53	Ukjent	1992	Kommune- og fylkesinndelingen i Norge i forandring. Christiansenkomiteens instilling.
	Institusjon KAD		Tidsskrifttittel NOU 15/1992
	Beskrivelse En omfattende gjennomgang av gjeldende kommune- og fylkesinndeling, og forslag til prinsipielle retningslinjer for revisjon av denne. Hovedstadsområdet betegnes som landets største inndelingsproblem og hevder at det foreligger et stort reformbehov.		
	Engelsk beskrivelse A broad analysis of current municipal- and county divisions. Proposals for fundamental guidelines for revision of divisions. The Oslo-Akershus area is characterised as the biggest divisional problem, and claims there is a strong need for reform.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
54	Ringnes, Christian et. al.	1992	Oslo-regionen: Utmark eller veksthus i det nye Europa: Rapport til Oslo Kommune
	Institusjon Kommunalt utvalg		Tidsskrifttittel Notat
	Beskrivelse Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
55	Teigen, Håvard	1992	Styrking og samordning av det regionale kunnskapssystemet: Region 6: Oppland, Hedmark, Oslo, Akershus og Østfold
	Institusjon KUF		Tidsskrifttittel Rapport
	Beskrivelse Vurdering av kunnskapssystemet - universitetet, høyskolene, forskningsinstituttene og rettleidningstjenesten for næringslivet - i region Oppland, Hedmark, Oslo, Akershus og Østfold, med hensyn til forenkling og innpassing i nasjonal sammenheng.		
	Engelsk beskrivelse An evaluation of the knowledge system - university, university colleges and research institutes - of Oslo, Akershus and 3 neighbouring counties, and proposals for simplification and for functional integration in the national knowledge system.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
57	Halvorsen, Knut	1992	En konkurransedyktig Osloregion. Anvendelse av Portermodeller i strategisk næringsplanlegging.
	Institusjon NIBR		Tidsskrifttittel Rapport 16/1992
	Beskrivelse Engelsk beskrivelse		

Id. 58	Forfatter(e) Halvorsen, Knut	Utgivelsesår 1992	Tittel Et konkurransedyktig Oslo: Anvendelse av Porter-modellen i strategisk næringsplanlegging.
	Institusjon NIBR		Tidsskrifttittel Notat 118/1992
	Beskrivelse		
	Engelsk beskrivelse		
Id. 56	Forfatter(e) Halvorsen, Knut og Johansen, Steinar	Utgivelsesår 1992	Tittel Norske byer i 1990-årenes Europa. Regionale og næringspolitiske utfordringer.
	Institusjon NIBR		Tidsskrifttittel Rapport 3/1992
	Beskrivelse		Rapporten går gjennom næringspolitiske utfordringer som blant annet skyldes økt internasjonalisering, nye produksjonsmønstre og aldring av befolkningen. En refererer næringspolitiske tiltak i andre land, og gir en rekke næringspolitiske anbefalinger.
	Engelsk beskrivelse		
	The report analyses challenges for industry development policy which are generated by internationalisation, new production patterns, ageing populations, and more. Initiatives in other countries are cited, and proposals made for similar initiatives here.		
Id. 59	Forfatter(e) Reve, Torger m. fl.	Utgivelsesår 1992	Tittel Et konkurransedyktig Norge
	Institusjon TANO		Tidsskrifttittel ISBN 82-518-3076-1
	Beskrivelse		En bred oversikt over norske næringer, og en Porter-inspirert analyse av næringenes sterke og svake sider. Studien av Telekommunikasjons- og IT-bransjen er relevant for studier av Oslo-regionen.
	Engelsk beskrivelse		
	A broad overview over norwegian industries, and a Porterinspired analysis of strong and weak sides of the industries. The study of ICT is particularly relevant for studies of the Oslo Region.		
Id. 60	Forfatter(e) Johansen, Steinar	Utgivelsesår 1991	Tittel Oslo havn: Regionalt nedslagsfelt, økonomiske ringvirkninger, miljøkonsekvenser, passasjertrafikk
	Institusjon NIBR		Tidsskrifttittel Rapport
	Beskrivelse		
	Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
61	Orderud, G. I. og Johansen, S.	1991	Utbygging av Gardermoen. Regionale virkninger.
	Institusjon NIBR		Tidsskrifttittel Rapport 35/1991
	Beskrivelse		
	Engelsk beskrivelse		
62	Bildeng, M. og Fürst, R. (red.)	1991	Norge trenger en storbypolitikk. En debatt om de store byenes funksjoner og særtrekk.
	Institusjon Storbyforskningsprogrammet og Kommun		Tidsskrifttittel
	Beskrivelse		
	Engelsk beskrivelse		
63	Pløger, John	1991	En by i forandring: kjøpesentre og byliv i Oslo sentrum
	Institusjon UiO		Tidsskrifttittel Occasional papers
	Beskrivelse		
	Engelsk beskrivelse		
64	Jacobsen, Jens Kåre	1990	Industri i Oslo: Utviklingstrekk og forklaringsfaktorer. Med en undersøkelse av innovative småbedrifters interaksjon med hovedstadens forskningsinstitusjoner.
	Institusjon BI		Tidsskrifttittel Diplomoppgave
	Beskrivelse		
	Industrisyssetningen går ned i Oslo bl.a. fordi det er mindre nyetablering av bedrifter i Oslo. Oppgaven fokuserer på utnytting av kompetanse, og finner at det er dårlige forbindelser mellom Oslos forsknings og utdanningsinstitusjoner og næringslivet.		
	Engelsk beskrivelse		
	Employment in industry in Oslo is falling, one reason being fewer new firms are established here. As one potential causal factor the utilisation of competence and knowledge from academic and institute research by business is analysed and found to be poor.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
65	Kjeldstadli, Knut	1990	Den delte byen. Fra 1900 til 1948.
	Institusjon J. W. Cappelen forlag, Oslo.		Tidsskrifttittel Oslo bys historie, bind 4.
	Beskrivelse Bred gjennomgang av Oslos historie i første halvdel av det 20. århundre.		
	Engelsk beskrivelse A broad analysis of the history of Oslo in the first half of the twentieth century.		
66	Rusten, Grete og Joranger, Pål	1990	Næringsutvikling og lokalisering i Oslofjordregionen.
	Institusjon Næringsøkonomisk institutt		Tidsskrifttittel Rapport 129/1990
	Beskrivelse Strukturanalyse av næringslivet i Oslofjordregionen. Gjennom en intervjuundersøkelse settes fokus på næringsutvikling og lokaliseringssatferd i viktige næringer, og på spørsmålet om betydningen av plassering av ny hovedflyplass i Osloområdet.		
	Engelsk beskrivelse Structural analysis of industry in the Oslofjord-region. Interview data is used to investigate issues concerning local industrial growth and localisation of firms, and the potential significance of a new Oslo Airport is analysed.		
67	Ukjent	1990	Feltnotat til kommuneplan: Næringsutvikling.
	Institusjon Oslo Kommune Byplankontoret		Tidsskrifttittel
	Beskrivelse		
	Engelsk beskrivelse		
68	Meissner, Stokka og Fagerlid	1990	Storbyenes ressursgrunnlag. En statistisk sammenligning.
	Institusjon Rogalandforskning og SINTEF		Tidsskrifttittel Rapport 11 Storbys forskningsprogrammet
	Beskrivelse		
	Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
69	Kjeldstadli, Knut	1989	Industrien i Oslo fra 1840- til 1980-åra.
	Institusjon		Tidsskrifttittel
	Beskrivelse		Nordisk samhällsgeografisk tidsskrift 9
	Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
70	Ukjent	1989	Om byutvikling og arealsituasjon i Oslo.
	Institusjon		Tidsskrifttittel
	Byrådet Oslo Kommune		Bystyremelding 1/1989
	Beskrivelse		
	Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
71	Rusten, G.	1989	Lokalisering og omlokalisering av hovedkontor i Oslo
	Institusjon		Tidsskrifttittel
	Oslo Kommune Byplankontoret		
	Beskrivelse		
	Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
72	Div.	1989	Industristatistikk (Oslo: 1961-1981)
	Institusjon		Tidsskrifttittel
	SSB		Norges Offisielle Statistikk
	Beskrivelse		
	Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
73	Berge, Tore	1989	Oslos nærings- og eiendomsutvikling på 1970- og 1980-tallet: En teoretisk tilnærming.

Institusjon

UiO

Beskrivelse

Nærings- og eiendomsutviklingen i Oslo forklares som et resultat av logiske tendenser i kapitalens dynamikk. Utbyggere sikter mot en kommersialisering av sosiale relasjoner og handlinger gjennom store integrerte handels og opplevelsessentre

Engelsk beskrivelse

Development in industry and real estate in Oslo is explained in a strict marxist perspective. Developers aim at commercialization of social relations and actions when they develop integrated shopping and "entertainment" centers (malls).

Id.	Forfatter(e)	Utgivelsesår	Tittel
74	Bildeng, M.	1988	Nærings og sysselsettingsutviklingen. Internt notat til Kommuneplan Oslo.

Institusjon

Byplankontoret Oslo Kommune

Beskrivelse

Tidsskrifttittel

Internt notat

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
75	Wasberg, Gunnar Christie	1988	Næringscenteret med hovedstadsfunksjon

Institusjon

Foreningen ...

Beskrivelse

Tidsskrifttittel

Notat

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
76	Aurdal, Ole M.	1988	Flyttevillighet blant Oslo-bedrifter.

Institusjon

Lokaliseringsutvalget

Beskrivelse

Tidsskrifttittel

Rapport

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
77	Div.	1988	Kompetanse (Oslo) Kompetanse: Informasjoner om utdanning

[Institusjon](#)
NAVFs utredningsinstitutt

[Beskrivelse](#)

Opphørte med nummer 5/1988.

[Tidsskrifttittel](#)
Statistikkhefte

[Engelsk beskrivelse](#)

Final publication was 5/1988.

Id.	Forfatter(e)	Utgivelsesår	Tittel
78	Amdam, Roar	1988	Regional utviling på fylkesnivå.

[Institusjon](#)
Senter for kommunalforskning / Møreforsk

[Beskrivelse](#)

[Tidsskrifttittel](#)
Rapport

[Engelsk beskrivelse](#)

Id.	Forfatter(e)	Utgivelsesår	Tittel
79	Isaksen, Arne	1988	Næringsutvikling i sentrum og utkant

[Institusjon](#)
Østlandsforskning

[Beskrivelse](#)

[Tidsskrifttittel](#)
Rapport 5/88

[Engelsk beskrivelse](#)

Id.	Forfatter(e)	Utgivelsesår	Tittel
80	Hekland, J. M.	1987	Næringsutviklingen i storbyene.

[Institusjon](#)
Prosjektet "Næringsutvikling i storbyene"

[Beskrivelse](#)

[Tidsskrifttittel](#)
Storbyrapport 2, hovedrapport 1987

[Engelsk beskrivelse](#)

Id.	Forfatter(e)	Utgivelsesår	Tittel
81	Veie, Ellen	1984	Hvilken betydning har teknologisk utvikling for industriens lokalisering.
	Institusjon UiT		Tidsskrifttittel Nordisk samhällsgeografisk tidsskrift
	Beskrivelse Intervjuundersøkelse av ledere i 16 elektrotekniske bedrifter i Oslo. Betydning av automatisering for lokalisering. Konklusjon at bedriftene vurderte utflytting for å få stabil arbeidskraft med passende kompetanse, med lavere kostnader.		
	Engelsk beskrivelse Interview based study of management in 16 electrotechnical firms in Oslo. The consequences of automation for localization. Concludes that firms wanted to move out in order to get stable workforce with adequate competence and at a lower cost.		
82	Stenersen, Marit Wardenær og Eilertsen, I. A.	1983	Små og mellomstore bedrifters markedstilpasning. Illustrert ved en undersøkelse blant grafiske nyetableringer i Oslo og Akershus.
	Institusjon BI		Tidsskrifttittel Diplomoppgave
	Beskrivelse Diskusjon av SMB-karakteristika, med disk. av bedriftsstørrelsesbegrepet. En generell analyse av etableringsprosessen. Fokus på grafisk bransje i Oslo. Konkluderer at bedriftene i bransjen fungerer i et marked som svarer til frikonkurransesmodellen.		
	Engelsk beskrivelse A discussion of the characteristics of SMBs, with a discussion of what is meant by "size". A general analysis of the proces of establishing a new firm. Focus on printing businesses, which, it is claimed, operate in a free competition type market.		
83	Veie, Ellen	1983	Teknologisk endring og industriens omlokalisering. En foretaksstudie av Oslo-basert elektroteknisk og elektronisk industri.
	Institusjon UiT		Tidsskrifttittel Hovedoppgave
	Beskrivelse Se beskrivelse av tidsskriftartikkel av samme forfatter.		
	Engelsk beskrivelse Confer description of paper by same author.		
84	Nystad, Jens; Sørensen, Paal; Gran, Håkon	1982	Sentrumsanalysen - et debattinnlegg om sentrums utvikling
	Institusjon Oslo Kommune Byplankontoret		Tidsskrifttittel Arbeidsnotat 2/82
	Beskrivelse		
	Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
85	Bakke, Alf	1982	Vil den teknologiske utvilingen påvirke strukturen i sveise- og konstruksjonfagene i de nærmeste år?

Institusjon
Statens yrkespedagogisk høgskole

Beskrivelse

Tidsskrifttittel
Hovedfagsoppgave

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
86	Isaksen, Arne	1982	Industrisyssestillingen i Oslo-Akershusområdet 1870-1980. Nasjonal konsentrasjon og dekonsentrasjon.

Institusjon
UiO

Beskrivelse

Tidsskrifttittel
Meddelelser fra geografisk institutt

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
87	Stormoen, Torstein	1982	Industriarbeidsplasser og industrilokaler. Hva skjer i Osloregionen?

Institusjon
UiO

Beskrivelse

Tidsskrifttittel
Hovedoppgave Insitutt for geografi

I Oslo/Akershus-regionen har tallet på sysselsatte innen vareproduksjon gått ned de senere år. Formålet med oppgaven er å se på årsaker til bortfall av industriarbeidsplasser i Oslo og Akershus. Fokus settes spesielt på industriens areal/lokalsituasjon.

Engelsk beskrivelse

The number of employees in manufacturing in the Oslo-region is falling. The aim is to study causes, and focus is set in particular on the situation of firms with respect to land/localization.

Id.	Forfatter(e)	Utgivelsesår	Tittel
88	Div.	1980	Ytre rammebetingelser for utviklingen i Oslo og Akershus frem år 2000

Institusjon
Gruppen for ressursstudier

Beskrivelse

Tidsskrifttittel
Rapport 279

Rapporterer resultatet av et fire måneders prosjekt omkring rammene for framtidig utviling i Osloområdet.

Engelsk beskrivelse

A report that summarises a four month project concerning the factors which will shape the development in the Oslo region towards year 2000.

Id. 89	Forfatter(e) Sjøhold, Peter og Stenstadvold,1980 Kjell	Utgivelsesår 1980	Tittel Rapport fra ekskursjon til Oslo, Ås og Halden ...
	Institusjon NHH / Geografisk Institutt		Tidsskrifttittel Rapport
	Beskrivelse		
	Engelsk beskrivelse		
Id. 90	Forfatter(e) Ukjent	Utgivelsesår 1980	Tittel Oslo Kommuneplan 1980-1990
	Institusjon Oslo kommune		Tidsskrifttittel
	Beskrivelse		
	Engelsk beskrivelse		
Id. 91	Forfatter(e) Ukjent	Utgivelsesår 1979	Tittel Bypolitikk
	Institusjon		Tidsskrifttittel Norges Offentlige Utredninger 1979: 5
	Beskrivelse		
	Engelsk beskrivelse		
Id. 92	Forfatter(e) Asplan	Utgivelsesår 1979	Tittel Det regionale planarbeid i Oslo-området og enkelte hovedtrekk ved utviklingen
	Institusjon Asplan		Tidsskrifttittel Utredning
	Beskrivelse En kort historisk framstilling av det regionale plansamarbeidet i hovedstadsområdet i de siste 25 år og hovedtrekk ved utviklingen siden 1970. Fokus på lokalisering av boligmasse og infrastruktur. Ingen diskusjon av næringspolitikk.		
	Engelsk beskrivelse A short historical description of the regional planning work taking place in the Oslo region during the last 25 years, and a discussion of some of the important developments since 1970. Focus on localisation of new residential areas and infrastructure.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
93	Ukjent	1979	Næringsanalyse for Oslo
	Institusjon Industrikonsulent A.S. Beskrivelse		Tidsskrifttittel
	Engelsk beskrivelse		
94	Rasmussen, T. Fr.	1979	Urbanisering og næringsutvikling i Norge i dette århundret. Vedlegg 1 i NOU 5/1979, Bypolitikk
	Institusjon Universitetsforlaget Beskrivelse		Tidsskrifttittel NOU 5/1979
	De store byregionene har spilt en ledende rolle i norsk samfunnsutvikling de siste 100 årene. Drivkreftene i den økonomiske utviklingen er å finne i det produksjonssystemet som har spesielt Oslo som sin forutsetning.		
	Engelsk beskrivelse		The large city regions have played a leading role in the development of Norway during the last century. The driving forces in economic development have their roots in a production system which is built up with Oslo in a particularly important role.
95	Ukjent	1979	Bypolitikk
	Institusjon Universitetsforlaget Beskrivelse		Tidsskrifttittel NOU 5/1979
	En bred gjennomgang av utviklingen i de store norske byene. Utvalget peker på storbyenes spesielle rolle i næringsutviklingen som bl.a. innovasjonssentre, og samtidig at deler av næringslivet har problemer og flytter ut.		
	Engelsk beskrivelse		A broad analysis of the development in the large Norwegian cities. The report points out that these cities play a crucial role in industrial development, among other as centers of innovation. At the same time, mature industries move out of city centers.
96	Gjesdahl, Torun	1978	Næringspolitiske problemstillinger for Oslo Kommune.
	Institusjon Oslo Kommune Byplankontoret Beskrivelse		Tidsskrifttittel Rapport 5/78
	Engelsk beskrivelse		

Id.	Forfatter(e)	Utgivelsesår	Tittel
97	Gjesdahl, Torunn	1978	Sysselsettingen i Oslo/Akershus: noen beregninger over utviklingen etter 1970.

Institusjon
Oslo Kommune Byplankontoret
Beskrivelse

Tidsskrifttittel
Rapport 1/1978

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
98	Iversen, T.	1978	Omlokalisering av Osloindustrien. Et forsøk på å finne frem til årsaker.

Institusjon
UiO
Beskrivelse

Tidsskrifttittel
Oppgave i sosialøkonomi

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
99	Div.	1977	Ei bok om Oslo. Planlegging og byutvikling før 1950.

Institusjon
Arkitektthøgskolen
Beskrivelse

Tidsskrifttittel
Studentarbeid

Engelsk beskrivelse

Id.	Forfatter(e)	Utgivelsesår	Tittel
100	Ukjent	1977	Omlokalisering av kontorbedrifter.

Institusjon
Byplankontoret Oslo Kommune
Beskrivelse

Tidsskrifttittel
Rapport 1/77

Engelsk beskrivelse

Id. 101	Forfatter(e) Ukjent	Utgivelsesår 1976	Tittel Næringsliv og sysselsetting i Oslo/Akershus.
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Institusjon
Byplankontoret Oslo Kommune
Beskrivelse

Tidsskrifttittel
Rapport 4/76

[Engelsk beskrivelse](#)

Id. 102	Forfatter(e) Ukjent	Utgivelsesår 1976	Tittel Perspektiver på Oslos næringsliv og arbeidsmarked.
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Institusjon
Byplankontoret Oslo Kommune
Beskrivelse

Tidsskrifttittel
Rapport 3/76

[Engelsk beskrivelse](#)

Id. 103	Forfatter(e) Hanssen-Bauer, Harald	Utgivelsesår 1976	Tittel Lokalsamfunnets oppfatning av næringslivet i Oslo-Akershus
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Institusjon
Oslo Håndverks- og industriforenings servi
Beskrivelse

Tidsskrifttittel
Rapport

[Engelsk beskrivelse](#)

Id. 104	Forfatter(e) Ukjent	Utgivelsesår 1976	Tittel Regionplan for Oslo og Akershus
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Institusjon
Regionplankontoret for Oslo og Akershus
Beskrivelse

Tidsskrifttittel

[Engelsk beskrivelse](#)

Id.	Forfatter(e)	Utgivelsesår	Tittel
105	Breirem, Arne Petter	1969	Industrialisering i Oslos sydområde.
	Institusjon NHH Beskrivelse		Tidsskrifttittel Utredning
	Engelsk beskrivelse		
106	Rasmussen, T. Fr.	1969	Byregioner i Norge
	Institusjon NIBR Beskrivelse		Tidsskrifttittel Rapport 11/1969
	Engelsk beskrivelse		
107	Roll-Hansen, Trygve	1969	Arealbruksstrukturen i Oslo
	Institusjon UiO Beskrivelse		Tidsskrifttittel
	Engelsk beskrivelse		
108	Helvig, Magne	1965	Oslofjord-området: en næringsgeografisk undersøkelse
	Institusjon Regionplankomiteen for Oslo-området Beskrivelse		Tidsskrifttittel Regionplanens hefter
	Analyse av befolkningsforhold, sysselsetting og næringsstruktur. Prognoser for utviklingen fram mot 1980. En kort diskusjon av godstransport. Ingen diskusjon av næringspolitikk.		
	Engelsk beskrivelse		
	Analysis of population, employment and industry structure for the Oslo region. Prognoses for the development towards 1980. No discussion of policies for industrial development.		

Id.	Forfatter(e)	Utgivelsesår	Tittel
109	Helvig, Magne	1962	Industrien i Oslo: en oversikt over utvikling, struktur ..
	Institusjon Regionplankomiteen for Oslo-området		Tidsskrifttittel Regionplanens hefter
	Beskrivelse		
	Engelsk beskrivelse		
<hr/>			
Id.	Forfatter(e)	Utgivelsesår	Tittel
110	Byplankontoret	1960	Oslo: Planlegging og utvikling. Oversikt over den geografiske og historiske bakgrunn, ...
	Institusjon Oslo Kommune		Tidsskrifttittel Notat
	Beskrivelse		
	Engelsk beskrivelse		
<hr/>			
Id.	Forfatter(e)	Utgivelsesår	Tittel
111	Heli, Hans	1950	Den industrielle utvikling i Oslo i det 19. århundre
	Institusjon Oslo Kommune		Tidsskrifttittel Statistisk kvartalshefte for Oslo
	Beskrivelse		
	Engelsk beskrivelse		
<hr/>			
Id.	Forfatter(e)	Utgivelsesår	Tittel
112	Sundt og Isachsen, G	1942	Bosteder og arbeidssteder i Oslo
	Institusjon		Tidsskrifttittel
	Beskrivelse		
	Engelsk beskrivelse		

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STEP-gruppen ble etablert i 1991 for å forsyne beslutningstakere med forskning knyttet til alle sider ved innovasjon og teknologisk endring, med særlig vekt på forholdet mellom innovasjon, økonomisk vekst og de samfunnsmessige omgivelser. Basis for gruppens arbeid er erkjennelsen av at utviklingen innen vitenskap og teknologi er fundamental for økonomisk vekst. Det gjenstår likevel mange uløste problemer omkring hvordan prosessen med vitenskapelig og teknologisk endring forløper, og hvordan denne prosessen får samfunnsmessige og økonomiske konsekvenser. Forståelse av denne prosessen er av stor betydning for utformingen og iverksettelsen av forsknings-, teknologi- og innovasjonspolitikken. Forskningen i STEP-gruppen er derfor sentrert omkring historiske, økonomiske, sosiologiske og organisatoriske spørsmål som er relevante for de brede feltene innovasjonspolitik og økonomisk vekst.

The STEP-group was established in 1991 to support policy-makers with research on all aspects of innovation and technological change, with particular emphasis on the relationships between innovation, economic growth and the social context. The basis of the group's work is the recognition that science, technology and innovation are fundamental to economic growth; yet there remain many unresolved problems about how the processes of scientific and technological change actually occur, and about how they have social and economic impacts. Resolving such problems is central to the formation and implementation of science, technology and innovation policy. The research of the STEP group centres on historical, economic, social and organisational issues relevant for broad fields of innovation policy and economic growth.