

The biotech, health and medicine industry in the Oslo region

FACTS & FIGURES

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General description of the industry

The health, medicine and biotechnology industry in the Oslo region comprised around 1 157 companies and employed more than 12 000 people in 2001. This industry group includes development and production of equipment and pharmaceutical products, including human and animal medicine, surgical equipment, dentists, healthcare centers, private hospitals and a range of biotechnology companies.¹

The industry's total revenues amounted to more than NOK 31 billion in 2001, representing a growth of 66 percent from 1997. In terms of value creation, these companies constitute more than NOK 8.3 billion, based on profits and wages (including social costs) of NOK 1.4 and 6.9 billion, respectively. The companies' total assets constitute more than NOK 50 billion with a return of 8.6 percent.

The health industry in Norway is growing and estimates shows that the community next year will spend approximately NOK 50 billion on healthcare services, making Norway the country in the Nordic region that spends most money on the public health services².

The health, medicine and biotechnology industry is a vaguely defined and includes a large collection of different types of companies. We have included all companies that manufacture products or offer services related to human or animal health. Knowledge of these topics is normally produced in universities and hospitals, but for biotechnology and pharmaceutical companies in particular, it is common to undertake in-house research and development. In Norway there is a lack of industry giants to drive development, but the government has traditionally shown great interest and willingness to invest in biotech and medical research activities.

The Federation of Norwegian Business and Industry (NHO) has clearly formulated their ambitions for the biotech industry. They want Norwegian government to stimulate the biotech industry to become an important income source when petroleum revenues come to an end. In order to achieve this goal, NHO has outlined a set of strategic criteria including increased access to manpower, modernisation of the public sector, an internationally competitive tax system, development of infrastructure, increased focus on

¹ All figures in this presentation are based on a population determined from a selection of NACE-codes, including individually selected companies from the health-medicine-biotechnology population to Oslo Teknopol. All companies not related to the industry have been removed. The population is corrected for errors to be as accurate as possible. The main NACE-codes used for this purpose are: 2440, 2441, 2442, 3310, 3543, 51389, 5146, 5230, 5231, 5232, 7512, 8500, 8510, 8511, 85112, 85113, 85114, 85115, 85116, 85117, 85118, 85120, 85121, 85122, 85123, 85124, 85125, 85126, 8513, 8514, 85141, 85142, 85143, 85144, 85145, 85148, 85146, 85147, 85149, 85159, 85310, 85320, 85311, 85312, 85324, 85329.

² http://www.dep.no/archive/shdvedlegg/01/07/oest_068.pdf

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research and development and political attitude and attention. Some of these criteria have already been implemented, such as taxation benefits for companies that undertake research and development.

The University of Oslo, The Norwegian University of Science and Technology, The Agricultural University of Norway and The Norwegian Veterinary Collage are the most important research institutions. These institutions also educate highly competent engineers and health personnel that provide Norwegian companies and public institutions with important knowledge.

Most of the Norwegian knowledge institutions of health, biotech and medicine are located in the Oslo region. At the University of Oslo (UiO) there is a research unit called The Biotech Centre of Oslo (BiO) which houses researchers and students from three faculties: Natural Sciences, Dentistry, and Medicine. They come from various disciplines like biochemistry, cell biology, genetics, physiology, biotechnology, pharmacy, microbiology. The common denominator is the use of technology derived from molecular biology and molecular genetics, i.e. gene technology. BiO is a "melting pot" for people from different disciplines as well from different nations. The Biotech Centre has a budget of NOK 18-20 million, about 30 percent of which is paid by UiO. The rest comes from external sources, both within Norway and internationally, such as research councils, humanitarian organisations, and various funds and legacies.

The Norwegian Radium Hospital in Oslo is a hospital specialising in treatment of cancer. They undertake advanced research and development on different disciplines related to cancer. Their Institute of Cancer Research includes department of biochemistry, biophysics, cell biology, genetics, immunology, pathology, and tumor biology. The Radium Hospital is also engaged in cooperation with private biotech companies. One of these companies is Dynal Biotech, which has developed a unique biomagnetic separation technology (Dynabeads). Dynal Biotech is located next door to the Cancer Hospital, but it also has units located close to the third knowledge institution in Oslo, the Norwegian Veterinary College.

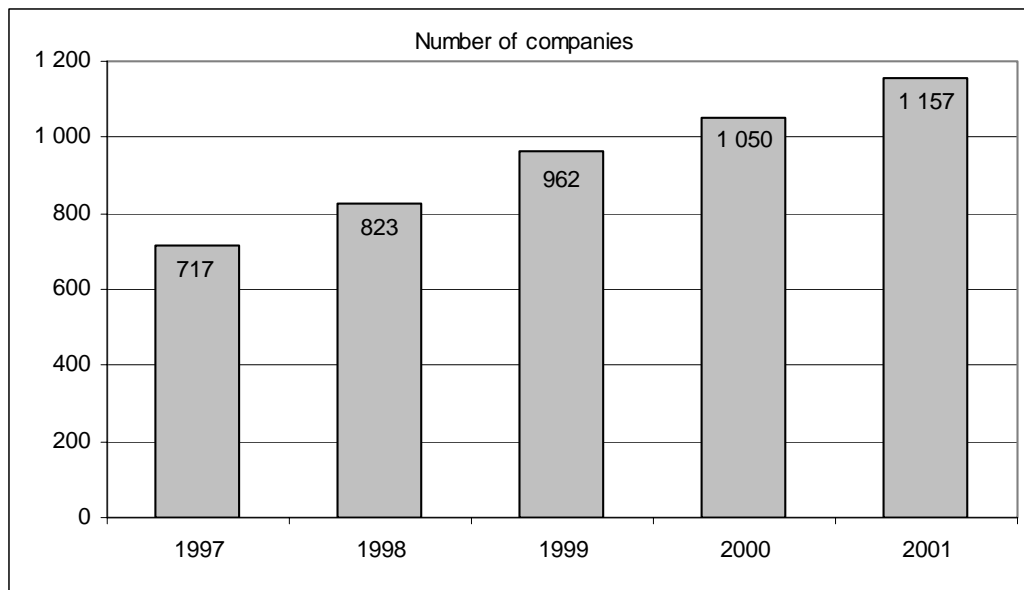
The Norwegian Veterinary College hosts a range of health, biotech and medicine institutions. Among these are Statens Næringsmiddeltilsyn, Statens Dyrehelsetilsyn, Veterinærinstituttet, and Veterinærmedisinsk oppdragssenter (VESO) The Veterinary Collage is engaged in many research areas such as biotechnology, animal health, food hygiene, environmental issues, diseases infected through food and water. The research units get some of their financing from external resources, in particular research on food hygiene, biochemistry, genetics, aqua biology, breeding and microbiology. The Veterinary College is located near the center of Oslo, which makes it easy to cooperate with other research institutions. Together with UiO and the Agricultural University of Norway, The Veterinary Collage has established a strategic alliance to stimulate cross-institutional research projects. In 2000, the College was involved in 163 cooperational projects, 33 percent in cooperation with UiO, 16 percent with the Agricultural University and 5 percent with the Radium Hospital. 24 percent was in cooperation with other partners in the Oslo region.

The research activities at The Agricultural University of Norway (NLH) are focused on environmental science, food science, biotechnology, aquaculture and business development. Matforsk is a research center located at NLH, and the two have in cooperation established the Food Alliance where Tine Norwegian Dairies is heavily involved. Matforsk performs research on food quality and knowledge on all processes related to food production.

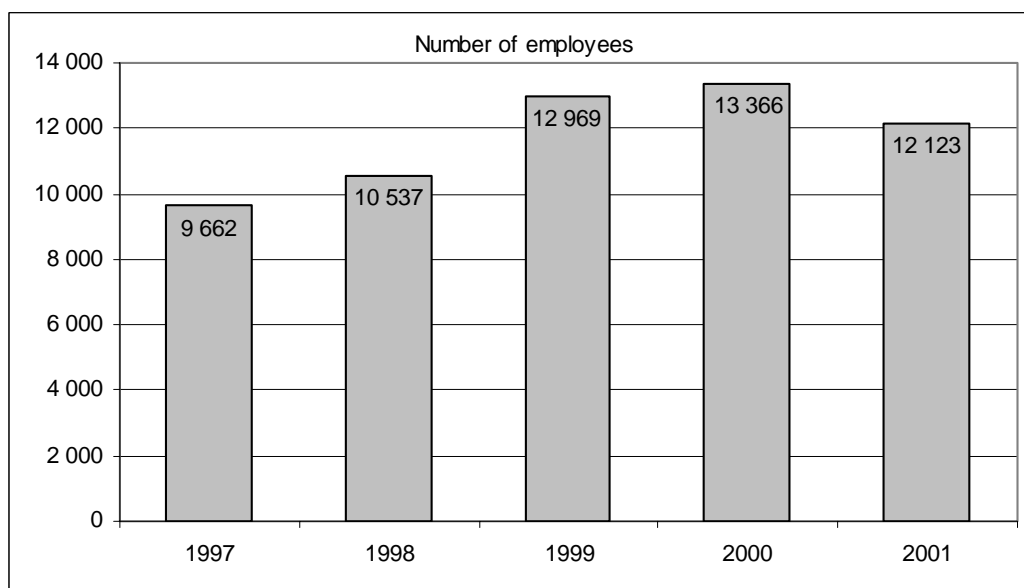
Industry development and performance

The number of companies operating in the health, biotech and medicine industry in the Oslo region has grown steadily from 646 in 1997 to 1046 in 2001. During the same period, the number of employees has grown from around 7 000 to around 12 000 with a peak in 2000 of approximately 13 000.

Number of companies



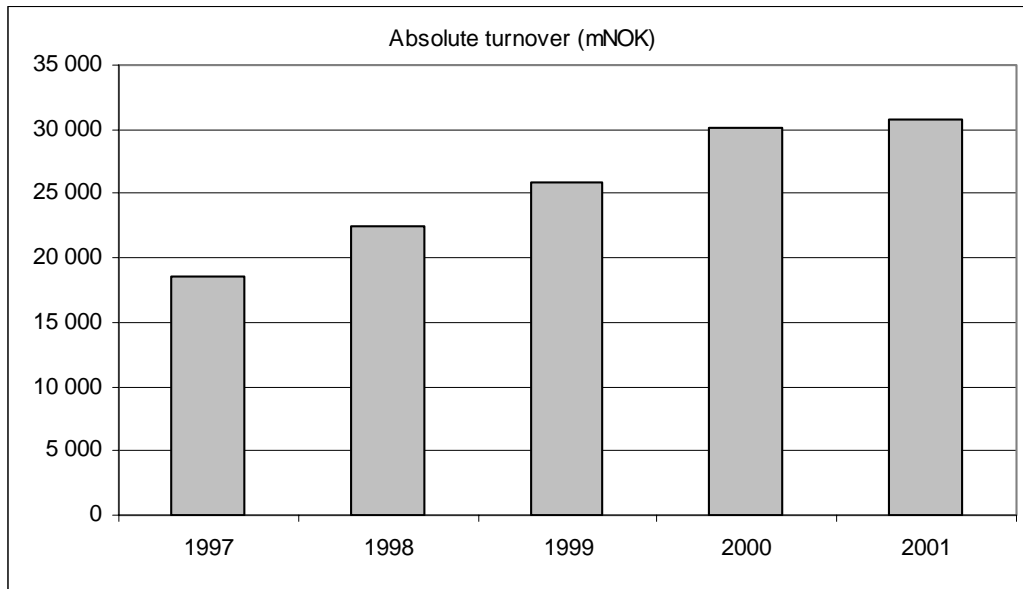
Number of employees³



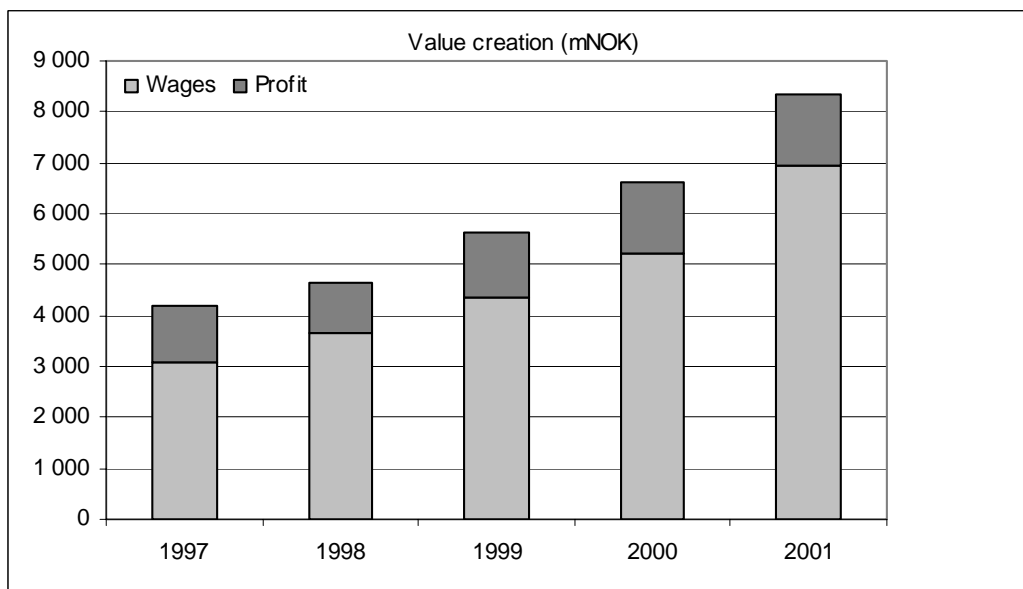
³ The data reporting on the number of employees tends to be underestimated in the Dun&Bradstreet database. The reason for this is that companies are not obliged under law to report such figures.

In terms of turnover, the industry experienced annual growth until 2001, from NOK 7 billion in 1997 to more than NOK 30 billion in 2001. From 1997 to 2001, the health, biotech and medicine industry's value creation nearly doubled from NOK 4 billion to more than NOK 8 billion.

Turnover



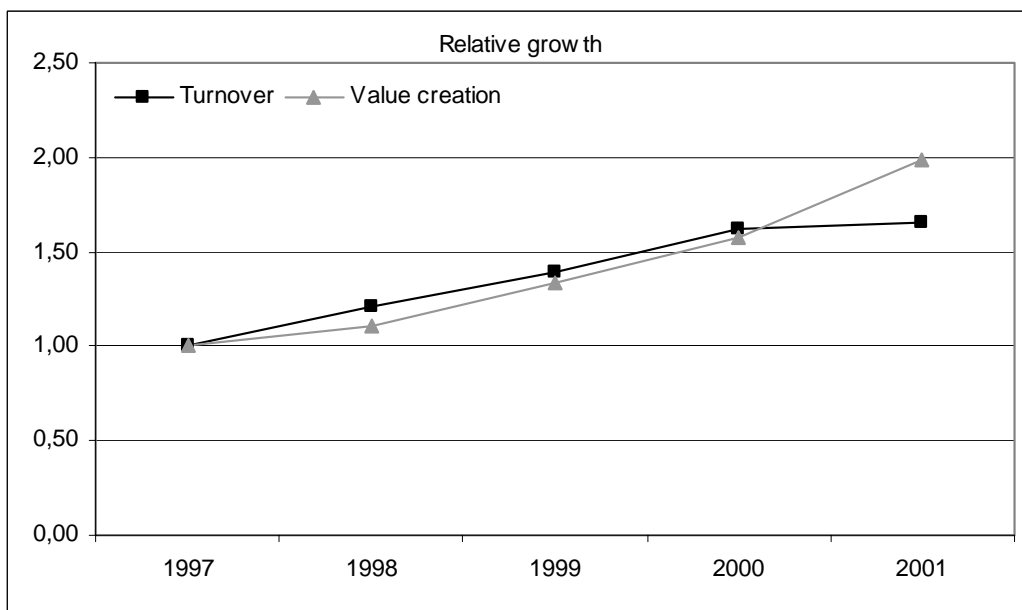
Value creation



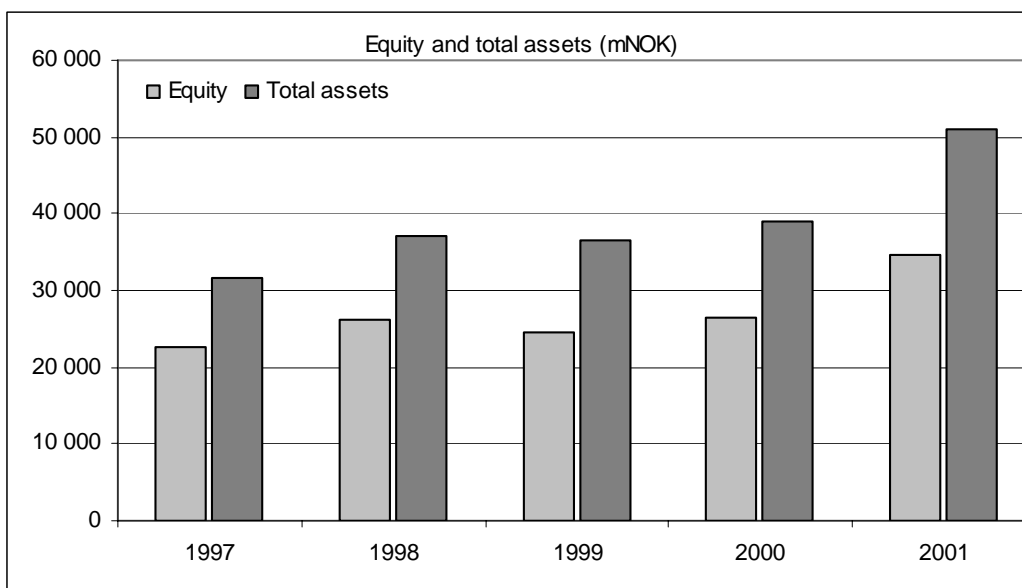
From 1997 to 2000, the accumulated turnover for the health, biotech and medicine industry in the Oslo region grew by 74 percent. The similar figure for the entire industry in Norway is 42 percent, so the health, biotech and medicine industry grew faster than the overall private sector, in terms of turnover.

In terms of relative growth, value creation for the health, biotech and medicine industry in the Oslo region increased by 60 percent from 1997 to 2000. In comparison, the corresponding performance figure for total private sector in Norway was 40 percent, indicating that the health, biotech and medicine industry in the Oslo region performed stronger than Norwegian industry on average.

Growth

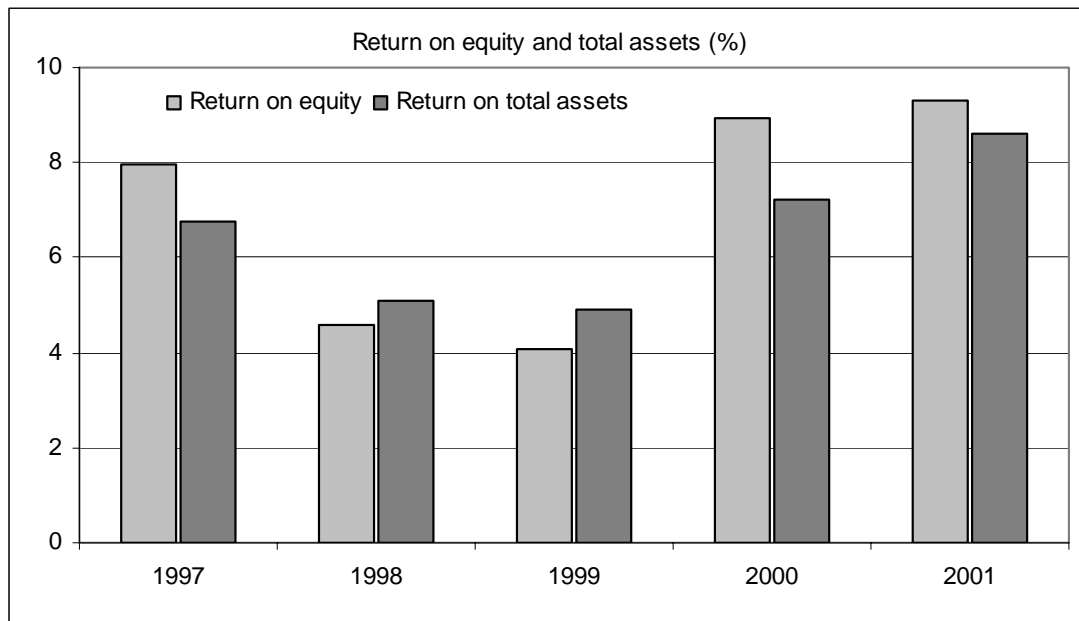


Equity and total assets

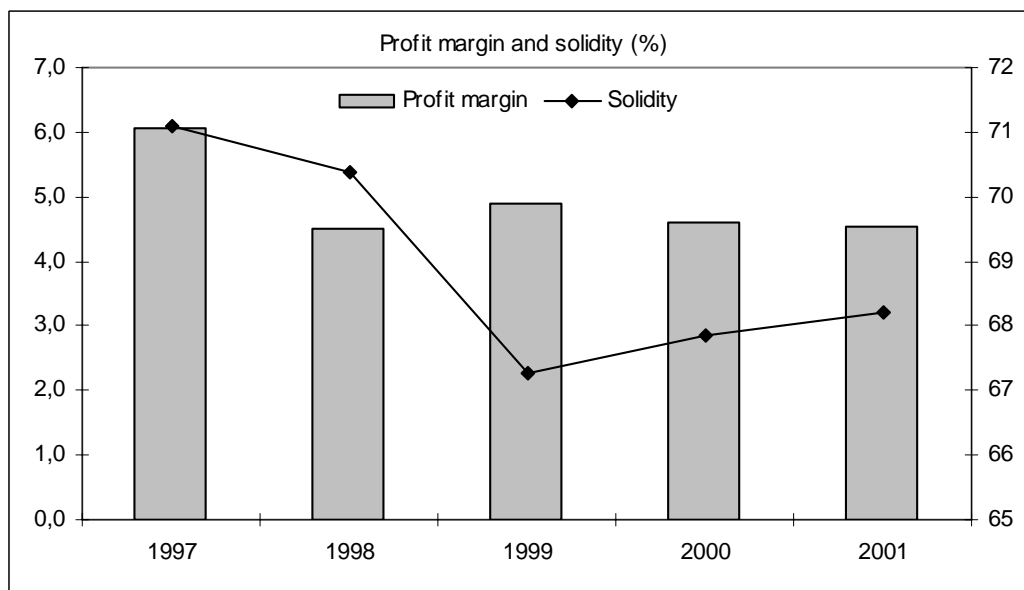


The profitability of the health, biotech and medicine industry in the Oslo region in terms of returns on equity and total assets declined from 1997 to 1999, from levels of 8 and 7 percent to 4 and 5 percent, respectively. But in 2000 and 2001 this changed, with levels for return on equity at more than 8 percent and return on total assets at 7 percent. The profit margin of the health, biotech and medicine industry in the Oslo region experienced similar performance, but with a decline from 1997 (more than 6 percent) to 2000 (4 percent). This trend seemed to turn in 2001 as profit margin reaches a level of 5 percent.

Returns



Profitability and solidity⁴

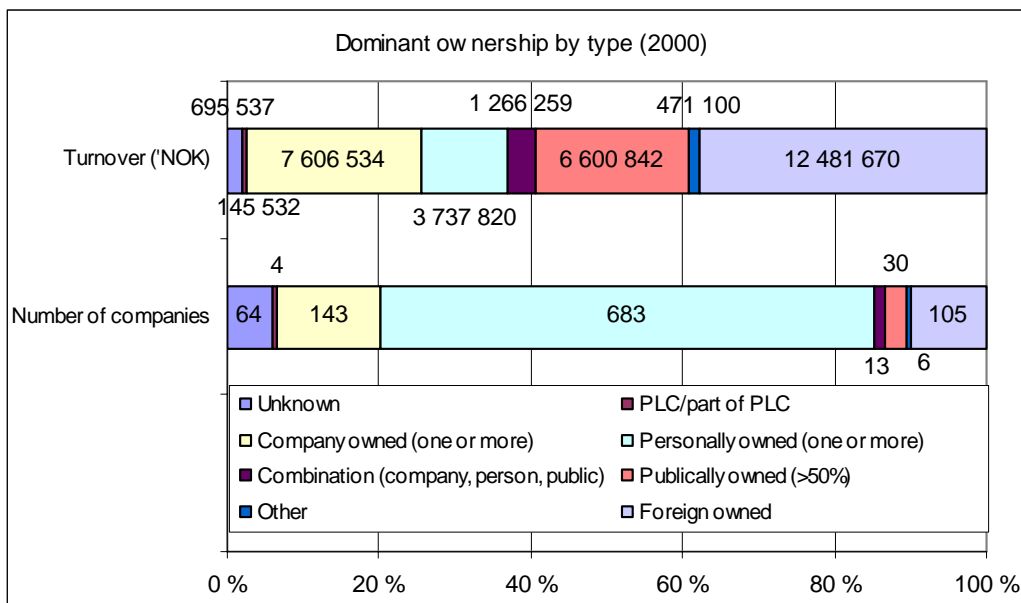


⁴ Solidity is measured by equity/total assets

Company characteristics

Ownership data indicates that most of the health, biotech and medicine companies in the Oslo region are privately owned. However, they constitute only about 10 percent in terms of turnover, which is a common picture in several industries. The most interesting observation is that the largest group of companies is controlled by foreigners, representing about 40 percent of the turnover. This indicates that the Oslo region might be perceived as an attractive location for foreign companies wishing to gain access to the Norwegian market and competence environment.

Ownership by type



The health, biotech and medicine industry in the Oslo region mainly consists of pharmaceutical companies, some specialized biotech companies, a few medical equipment producers and some private hospitals and health institutions. Most of the bigger companies are Norwegian subsidiaries of foreign or multinational pharmaceutical groups. Many of these undertake substantial in-house research and development and are among the important knowledge producers in the industry.

The five biggest companies within the health/medicine/biotech industry in Oslo are:

Amersham Health - Norwegian branch of the English controlled world-leading manufacturer of diagnostic imaging products. 2001 turnover was NOK 3.8 billion.

Apokjeden Distribusjon – Norwegian subsidiary of the Finnish based Tamro Group. Owns about 140 pharmacies and represents a fully integrated wholesale and retail group. 2001 turnover was NOK 3.5 billion.

Nycomed Pharma AS – Norway's leading manufacturer of non prescriptive remedies and other health products. Turnover 2001 was NOK 1.1 billion.

Holtung AS – Holtung is a wholesaler and distributor of pharmaceutical products. 2001 turnover was NOK 996 million.

Alpharma AS – Is a Norwegian subsidiary of American controlled Alpharma Inc. Alpharma AS is a pharmaceutical company that produces generic remedies for humans and animals. 2001 turnover was NOK 946 million.

Top 25 – key figures⁵

Company	Size		Growth		Profitability	
	Turnover 2001 (NOK)	Value creation 2001	Growth turnover (97-01)	Growth value creation (97-01)	Profit margin 2001	Return on total assets (2001)
AMERSHAM HEALTH AS	3 878 080	1 623 056	61 %	91,41 %	28,28 %	27,96 %
APOKJEDEN DISTRIBUTJON AS	3 534 562	99 509	N/A	N/A	0,49 %	2,98 %
NYCOMED PHARMA AS	1 136 579	344 161	N/A	N/A	3,01 %	8,96 %
HOLTUNG AS	995 736	10 519	-28 %	-74,07 %	-3,58 %	-7,86 %
ALPHARMA AS	946 156	345 112	20 %	26,26 %	3,31 %	6,10 %
VITUSAPOTEK AS	891 944	124 069	N/A	N/A	-3,11 %	-4,53 %
ASTRAZENECA AS	855 138	172 263	1370 %	874,83 %	1,88 %	3,25 %
GLAXOSMITHKLINE AS	793 206	193 421	79 %	38,70 %	7,45 %	20,98 %
PFIZER AS	679 440	201 567	176 %	437,21 %	8,09 %	15,84 %
PHARMACIA NORGE AS	610 779	97 021	N/A	N/A	4,64 %	15,48 %
LOVISENBERG DIAKONALE SYKEHUS	609 605	454 372	92 %	88,72 %	1,16 %	4,14 %
DIAKONHJEMMETS SYKEHUS AS	572 663	424 176	N/A	N/A	0,18 %	N/A
NOVARTIS NORGE AS	405 435	67 275	50 %	88,86 %	2,09 %	8,30 %
WEIFA AS	293 514	110 908	22 %	14,66 %	9,53 %	9,90 %
ADVISO AS	291 847	145 946	N/A	N/A	8,04 %	17,74 %
MEDECO AS	265 767	39 102	N/A	N/A	1,49 %	2,65 %
FEIRINGKLINIKKEN AS	262 020	149 527	N/A	N/A	0,85 %	2,16 %
ROCHE NORGE AS	253 297	60 095	109 %	202,29 %	3,29 %	12,00 %
AVENTIS PHARMA AS	234 147	46 171	259 %	374,13 %	-0,54 %	-0,69 %
NOVO NORDISK SCANDINAVIA AS	225 042	62 074	-31 %	80,00 %	15,01 %	48,91 %
PRONOVA BIOCARE AS	221 407	39 947	158 %	44,46 %	-7,22 %	-2,79 %
ABBOTT NORGE AS	220 848	41 662	487 %	540,17 %	2,95 %	12,99 %
DYNAL BIOTECH ASA	219 421	109 775	36 %	129,76 %	21,58 %	26,30 %
PARANOVA AS	198 431	6 986	146 %	7,56 %	2,22 %	8,40 %
DR FURST MEDISINSK LABORATORIUM	197 087	11 066	3 %	-62,52 %	2,16 %	7,17 %

Some of the most interesting health, biotech and medicine companies in Norway are located in the Oslo region. A few of them are presented in the following section.

PhotoCure is a Norwegian company with a mission to develop and sell pharmaceuticals and medical devices based on proprietary photodynamic technologies. The company develops products for skin cancer and other skin diseases, internal cancer, gene therapy and cancer vaccines. Its Metvix and Curelight products were developed for the treatment of basal cell carcinoma (skin cancer) and actinic keratosis (pre-cancerous skin lesions). PCI Biotech was established as a subsidiary of PhotoCure in order to develop and commercialise new transfection technologies for the research market as well as products for oncology and gene therapy. The company was founded by The Norwegian Radiumhospital Research Foundation to commercialise and develop technology originally started by the NRH. Photocure is now a listed company but still has a clear intention to collaborate with academic institutions for developing new products and platform technologies.

Dynal Biotech is a world leader in the research, development and manufacture of magnetic and non-magnetic bead products based on proprietary technology. Dynal Biotech manufactures and markets a wide range of different products, including magnetic, monosized polymer particles sold under the well-known brand name Dynabead, as well as non-magnetic, monosized beads sold under the Dynosphere brand name. Dynal Biotech's biomagnetic separation technology is a leading method for the isolation of biological

⁵ In cases where data is unavailable N/A is used.

material, including cells, nucleic acids, proteins and pathogenic microorganisms. Dynal Biotech has established supply and collaboration agreements with a number of leading diagnostics, genomics and cell therapy companies. In addition, a substantial amount of Dynal Biotech's revenue is derived from sales to research institutions throughout the world. Dynal Biotech also has a strong position in the tissue typing industry, supplying products for the matching of organ and bone marrow donors and recipients. Dynal was formed in 1986 as a joint venture between Dyno Industrier and A.L. Industrier, combining the knowledge from chemical, pharmaceutical and biotechnological fields. Swedish Nordic Capital acquired the company in June 2001.

Meditron is a Norwegian company producing medical equipment, mainly stethoscopes. They have succeeded in developing a sensor technology in close cooperation with Norwegian medical expertise and high tech environments worldwide. This cooperation has resulted in a new generation of innovative, auscultation products, with proven benefits over existing auscultation products. Meditron's long-term objective is to continue to develop auscultation equipment with proven benefits over existing auscultation equipment, both to improve patient monitoring and to help practitioners to pick up body sounds with true clinical value. In addition to the stethoscopes, Meditron has developed software for heart analysis that can be used in education as well as in hospitals. The Meditron products have received attention from various important customers and their technology is among others used at Harvard Medical School. The latest James Bond movie also shows some of Meditron's stethoscopes as Agent 007 fakes a heart attack. Use of this effective marketing tool should help Meditron in their attempts to break into the US market.

Akvaforsk is one of the world's leading research institutions for aquaculture and has specialised in breeding and genetics, product quality and marine species. In addition, the institute also conducts research related to fish health, environment and operational optimising. The research centre began its research operations in 1971 and set up two research stations - one land-based at Sunndalsøra and one sea-based at Averøy. The head office is situated in the Agricultural University of Norway at Ås, Akershus, where Akvaforsk also teaches aquaculture to students taking their master and doctoral degrees. Akvaforsk has 91 employees, of whom 39 are researchers and doctoral candidates. To be able to administer breeding operations on a worldwide basis, Akvaforsk has established the subsidiary Akvaforsk Genetics Center, an international expertise centre for planning, implementation and operation of aquaculture breeding programmes. Together with ICLARM, Akvaforsk has participated in a ten-year breeding experiment with tilapia in the Philippines. Up to now, the Genetics Center has worked with 16 species in 25 different countries.

GlaxoSmithKline is one of the world's leading research based pharmacy companies and undertakes research on molecular biology and gene technology. World-wide the company employs about 100 000 people and generates revenues at about NOK 240 billion. The Norwegian subsidiary has about 160 employees and turnover in 2001 exceeded NOK 800 million. In Oslo, the company has established an innovation center next to their headquarters, with the purpose of creating ties to the Norwegian research environment. The innovation center is a meeting point for medical research and business development within the health sector, and a place for entrepreneurs to commercialize their ideas. GlaxoSmithKline offers incubator facilities including free offices, cafeteria, meeting rooms and knowledge on commercialization. The innovation center is primarily meant for young researchers with biology or health background from the universities.

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