

# The Impact of the Multinational Pharmaceutical Industry on Norway's Economy and Society

JANIS UMBLIJS, FINN RYGH, IVAR SØNBØ KRISTIANSEN AND ERIK MAGNUS SÆTHER FROM OSLO ECONOMICS,  
WITH DAG MORTEN DALEN FROM BI NORWEGIAN BUSINESS SCHOOL

# Preface

This report analyzes the impacts of the multinational pharmaceutical industry on Norway's economy and society. The aim of the report is to highlight the main ways in which the industry contributes to the Norwegian economy and society and provide comparisons with other sectors in Norway and with similar sectors in other countries.

This project was carried out by Oslo Economics and BI Norwegian Business School on behalf of the American Chamber of Commerce in Norway.

The analysis is based on official accounting data, information from in-depth interviews and data from an online questionnaire conducted in 2015.

The project was funded by AbbVie, AstraZeneca, Bristol-Myers Squibb, Eli Lilly, GSK, GE Healthcare, Janssen-Cilag, MSD, Novartis, Pfizer and Roche.

The authors are indebted to Jason Turflinger and Tiago Campos Rodrigues for their support in all stages of researching and writing this report. The authors would also like to thank Amir Sasson for his valuable input.

The report authors are:

Janis Umblijs, Finn Rygh, Ivar Sønbo Kristiansen and Erik Magnus Sæther from Oslo Economics, with Dag Morten Dalen from BI Norwegian Business School.

Oslo, May 2016

Please write to [amcham@amcham.no](mailto:amcham@amcham.no) for additional report copies and inquiries

# Contents

Overview and Key Findings	4
1. Health Impacts: Better and Longer Lives	5
2. Development of Health Services	7
3. Research and Innovation	8
4. Employment and HR Development	11
5. Economic Impact	14
6. Possibilities for Development and Growth	16

# Overview and Key Findings

We focus on four types of impacts: health and health services: research and innovation; employment; and HR development and economics. While the direct economic impact of the sector is moderate in relation to the Norwegian economy, Multinational Pharmaceutical Companies (MPCs) contribute significantly by developing products that lead to better and longer lives with increased workforce participation. In addition, these companies contribute to health service development and better and safer drugs as well as clinical research and innovation in the health sector. Furthermore, MPCs provide quality jobs for highly educated individuals, encouraging those educated in Norway to stay in the country and create an attractive environment for international talents. Several MPCs have production facilities in Norway, most of which are located outside of the main cities, creating jobs in regional economies.

To highlight the various impacts that MPCs have on Norwegian society, we use existing official accounting and statistical data. Where data does not exist, we obtain information from in-depth interviews with leading figures in the sector as well as results from an online

questionnaire. Whenever possible, we quantify effects and when not possible, we describe the impacts qualitatively.

## Key Findings

Our analysis suggests that multinational pharmaceutical companies provide significant benefits to the Norwegian economy and society in a number of critical ways. MPCs have significant direct health benefits for Norwegian patients and society as they have developed the majority of medicines used in Norway today. They also improve the quality of clinical research by providing clinical trial expertise and through other types of collaboration with Norwegian hospitals. In addition, MPCs are one of the main actors in pharmaceutical research and innovation in Norway and create highly specialized, good quality jobs.

While the socioeconomic impact of MPCs is significant, compared to other European countries the size of the sector in Norway is below average and the smallest of all Nordic countries. This suggests there is potential for the sector to grow. Given the industry's health improvement contributions, high productivity and innovation, the impact of increasing the size of the sector is likely to be higher than in many other branches of industry.

*Medicines produced by MPCs have both a direct socioeconomic effect by improving the quality and length of life, as well as an indirect economic benefit through the increased productivity that better health brings.*

# 1. Health Impacts: Better and Longer Lives

Norway is a net importer of pharmaceutical products and therefore relies on medicines and treatments developed by MPCs for a considerable proportion of treatments. All of the 25 largest pharmaceutical companies in Norway are foreign owned multinationals. Furthermore, multinational companies produce all of the top 25 most sold medicines in Norway<sup>1</sup>. Medicines produced by MPCs have both a direct socioeconomic effect by improving the quality and length of life, as well as an indirect economic benefit through the increased productivity that better health brings. This section outlines the main impacts of the multinational pharmaceutical industry on health in Norway.

## Contribution to better and longer lives

According to the Norwegian prescriptions database, 3.5 million individuals in Norway (69 percent of the population) used prescription medicines in 2013 (Figure 1), with the vast majority produced by MPCs. Among these medicines, antineoplastic and immune modulating therapies make up a quarter of the total pharmaceutical expenditure (total market, in terms of revenue). These include anti-cancer drugs and drugs for inflammatory diseases (rheumatic disorders, intestinal disorders, etc)<sup>2</sup>. Such diseases have a particularly high incidence in Norway, with significant health and productivity burdens.

Economic evaluation of health interventions has been recommended for 15-20 years in Norway, and in practice most pharmaceuticals undergo economic evaluation before adoption in health care. This means that the reimbursement processes contribute to cost-effective treatment in the area of pharmaceuticals while we know relatively little about cost-effectiveness for the rest of health care.

Figure 1. Total number of patients using prescription medicines in Norway, 2013 (thousand)



Source: The Norwegian Prescription Database, figure from Legemiddelindustrien (LMI). Tall og Fakta 2015

## Contribution to increased participation in the labor market

Statistics Norway estimates that in the fourth quarter of 2015, the share of employees absent from work due to doctor certified sickness was 5.8 percent. This corresponds to significant sick leave costs for private companies and lost Norwegian labor force productivity. While it is difficult to quantify the economic cost of absenteeism, the Norwegian Health Directorate has suggested it could be in the range of NOK 150 billion annually. MPCs contribute directly to reducing the cost of illness by developing and producing the majority of medicines used in Norway, thereby reducing work absence and increasing the productivity of the Norwegian labor force.

<sup>1</sup> The top 25 medicines refer to total revenue from 2014 sales. Source: Legemiddelindustrien (LMI). Tall og Fakta 2015.

<sup>2</sup> Legemiddelindustrien (LMI). Tall og Fakta 2015.

## 2. Development of Health Services

MPCs have a positive impact on health services in Norway in three primary ways. First, by providing health professionals in Norway with access to international networks. This means that Norwegian clinicians get early access to information and hands-on experience with next-generation therapies through participation in scientific conferences and workshops organized by MPCs. Second, through increased knowledge from collaboration projects between MPCs, hospitals and universities. This knowledge contributes to more effective and safer use of medicines. Finally, by collaborating with Norwegian hospitals to carry out clinical trials. This benefits patients who get earlier access to next-generation therapies as well as medical professionals involved in those trials.

### Information and networking

In addition to working closely with Norwegian universities and hospitals, MPCs are active in organizing training, information and networking seminars. In the last year, the 14 MPCs surveyed in this study conducted over 600 non-commercial activities that have contributed to the sharing of information, knowledge and skills with individuals outside of the company. The average number of such activities was 44 per company. Given the fast pace of innovation for the treatment of many illnesses, this exchange contributes to improving health care in Norway.



### CASE STUDY CHOLESTEROL CLINICAL TRIAL IN NORWAY

Initiated in Norway, the Scandinavian Simvastatin Survival Study (also known under the abbreviation 4S) was a multicenter clinical trial among 4 444 patients. It showed that cholesterol-lowering treatment with the statin simvastatin significantly increased survival in patients who had experienced a heart attack. The study was supported by Merck Research Laboratories and was conducted in the 1990s. It constitutes, together with other studies, the scientific basis for the widespread use of statins.

The objective of the study was to assess the effect of a simvastatin on a group of 4 444 patients with coronary heart disease, ages 35 to 70 years. The trial showed that treated patients had significantly lower mortality and morbidity rates compared to those on earlier treatments. The 4S study was a milestone in cardiology and evidence-based medicine. While there had been scientific uncertainty and even disagreement about the benefits from lowering cholesterol levels, 4S proved that treatment with statins changed the occurrence of events in patients with coronary heart disease.

### Development of new drugs and procedures

MPCs are actively involved in the development of novel treatments by collaborating closely with Norwegian hospitals, universities and research institutes. In addition to clinical trials, the MPCs surveyed for this study conducted 219 R&D projects with local universities and hospitals over the last three years.

### Clinical trials and early access

Clinical trials provide early access to treatments under controlled conditions to test the effects of the product for human use. The size of clinical trials varies, from international trials involving many thousands of patients to small local studies. In addition to generating evidence

about the effectiveness of medicines, they offer patients early access to treatment and clinicians with experience of running international clinical trials.

Between 2011 and 2013, pharmaceutical companies had more than 535 ongoing clinical trials in Norway<sup>3</sup>. MPCs conducted fewer clinical trials in this period in Norway than in other Nordic countries. On average, respondents estimated that within their company 38 percent less clinical trials were conducted in Norway than the average in the other Nordic countries.

<sup>3</sup> Source: LMI. Forskning og utvikling i Legemiddelindustrien, 2014. Only includes LMI members, so total number is higher.

*On average, respondents estimated that within their company 38 percent less clinical trials were conducted in Norway than the average in the other Nordic countries.*



### CASE STUDY PARTNERSHIP WITH OSLO UNIVERSITY HOSPITAL ON CANCER TRIALS

Over the last years, Novartis has worked closely with the Oslo University Hospital on clinical trials for cancer treatments. Through this collaboration, the Oslo University Hospital was qualified as a clinical research site that can run Novartis Oncology “first in man” (Phase I/II) studies. Subsequently, this collaboration led to eight Phase I and II trials conducted in Norway, with more being planned. *See Figure 12.*

This collaboration means that patients in Norway received access to novel anti-cancer medicines years before they are potentially available on the market. For example, Oslo University is currently the only Nordic site to run CTL019 trials (this is a novel investigational therapy, a Chimeric Antigen Receptor (CAR) T cell therapy, the latest in cell-based gene therapy for the treatment of cancers) and receives patients referrals from other Nordic countries. Furthermore, researchers in Norway gain experience in next generation medicines that help them in their clinical practice and with their own research expertise and projects, strengthening Norway as a research center of excellence within Oncology.

*The pharmaceutical industry is one of the most productive and innovative in Europe, with value added significantly above the average for high-tech and manufacturing industries.*

## 3. Research and Innovation

According to EUROSTAT data, the pharmaceutical industry is one of the most productive and innovative in Europe, with value added significantly above the average for high-tech and manufacturing industries. This is of interest for policy makers as there is growing evidence that innovation is important for long-term economic performance and growth. This section outlines the level of research and development conducted in Norway as compared to other European countries; compares the level of innovation among multinational pharmaceutical companies in Norway with other sectors in the country; and discusses the impacts of innovation clusters and start-ups on the Norwegian economy.

### Pharmaceutical R&D in Europe

The levels of investment by the pharmaceutical industry vary significantly between European countries (Figure 2). The total amount invested in Norway was below average in 2013 for the selected countries, according to data from the European Federation of Pharmaceutical Industries and Associations (EFPIA). Taking into account its small population, Norway does somewhat better in terms of amount spent in R&D per capita (Figure 3). An interesting country comparison is neighboring Sweden, where per capita investment in research and development by the pharmaceutical industry is more than three times higher than Norway's. If Norway increased its per capita investment in pharmaceutical R&D to match that of Sweden's, the total invested would increase by over NOK 2,350 million.



### CASE STUDY TNF-INHIBITORS – AN IMPORTANT GROUP OF PHARMACEUTICALS FOR NORWEGIAN PATIENTS

Developed and produced by multinational pharmaceutical companies, TNF-inhibitors (e.g. Enbrel® and Humira®) and similar immune modulating biologics are the most commonly prescribed pharmaceuticals in Norway with total sales of NOK 386 million in 2014. TNF-inhibitors are used for a range of diseases: rheumatoid arthritis, ankylosing spondylitis, psoriasis, psoriasis arthritis, Crohn's disease, ulcerative colitis and others. In 2014, approximately 25,000 patients<sup>4</sup> were on treatment with TNF-inhibitors in Norway. A recent PhD study from the Oslo University indicates that each patient on TNF inhibitors for rheumatoid arthritis receives a health benefit of approximately one quality adjusted life-year<sup>5</sup> compared to earlier treatment<sup>6</sup>. TNF-inhibitors consequently generate substantial health benefits for the Norwegian population.

<sup>4</sup> Source: The Norwegian Prescription Register

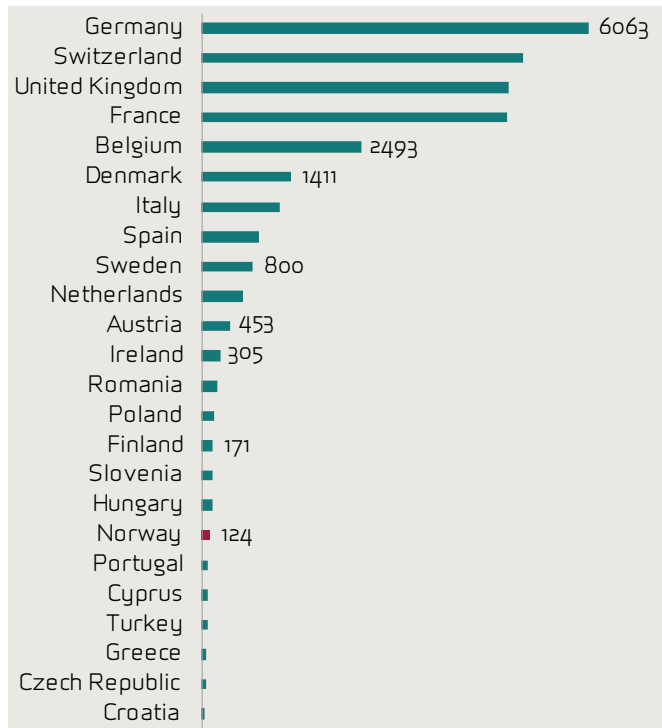
<sup>5</sup> The quality-adjusted life year (QALY) is a generic measure of disease burden, including both the quality and the quantity of life lived. One QALY equates to one year in perfect health. It is used in economic evaluation to assess the value for money of medical interventions.

<sup>6</sup> Source: Kvamme M.K., 2015. Cost-effectiveness of TNF inhibitors vs synthetic disease-modifying antirheumatic drugs in patients with rheumatoid arthritis: a Markov model study based on two longitudinal observational studies. *Rheumatology*, 53:113.



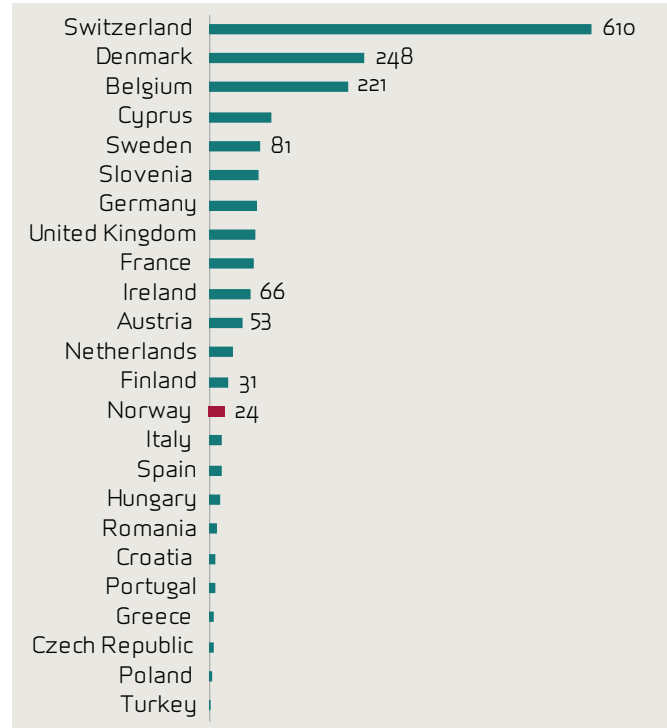
*If Norway increased its per capita investment in pharmaceutical R&D to match that of Sweden's, the total invested would increase by over NOK 2,350 million.*

Figure 2. Total pharmaceutical industry research and development in Europe, 2013 (EUR million)



Source: European Federation of Pharmaceutical Industries and Associations

Figure 3. Per capita pharmaceutical industry research and development in Europe, (EUR per inhabitant)



Source: European Federation of Pharmaceutical Industries and Association



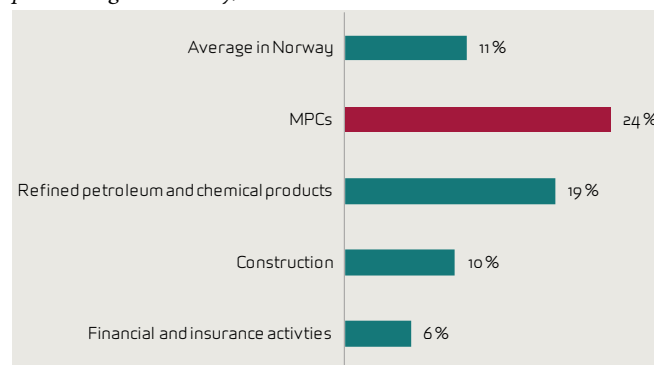
### CASE STUDY OSLO CANCER CLUSTER

The Oslo Cancer Cluster (OCC) had its beginnings in the Norwegian Radium Hospital and its associated Institute for Cancer Research. Today the cluster gathers almost 70 members from Norway and Northern Europe, representing the entire oncology value chain. The members include multinational pharmaceutical companies, academic research institutions, university hospitals, universities, support groups, financial institutions and regional development players in the field of cancer R&D. The work of the cluster has benefited Norway's society by increasing the number of clinical trials in novel treatments, improving the quality of care through closer collaboration and by attracting international investment in innovative research.

## Pharmaceutical R&D in Norway compared to other sectors

While the total amount of investment in pharmaceutical R&D conducted in Norway is modest, MPCs are significantly more innovative than the average Norwegian company (Figure 4). The share of total revenue made from innovative products for MPCs in Norway was 24 percent, compared to a national average of eleven percent. For comparison, Figure 4 also shows the average levels of innovation for a number of key industries in Norway.

Figure 4. Share of total revenue generated from innovative products per Norwegian industry, 2014



Source: Estimate for MPCs is from a survey of 14 leading multinational pharmaceutical companies in Norway. Norway and sector averages are data from Statistics Norway. We asked MPCs exactly the same question as Statistics Norway's national survey. Innovative products are defined as new or significantly improved goods or services introduced in the last three years.

## Innovative clusters and start ups

The growing pharmaceutical industry in Norway has specialized in a number of innovative areas. In some of these areas, innovative clusters have led to the development of new treatments with both a domestic and global impact. Two examples of innovative clusters that have had a significant impact on the Norwegian society and economy are the Oslo Cancer Cluster and the Bergen Marine Research Cluster.



### CASE STUDY SEAFOOD INNOVATION CLUSTER IN BERGEN

The Norwegian Center of Expertise (NCE) Seafood Innovation cluster in Bergen is one of the largest seafood clusters in the world, representing 70 industry players along the entire seafood value chain. An important company in the innovation cluster is MSD Animal Health, one of the pioneers that transformed the Norwegian fish farming industry in the 1980s by introducing effective treatment for the most common diseases found in cold-water fish. In 2015, the company introduced a new vaccine for the salmon industry, allowing farmers to immunize fish against all major diseases with one injection; earlier, this was done in two injections. MSD Animal Health is part of a vibrant research and innovation cluster in fish health based in Bergen, which is world leading in salmon and trout related research. All Merck/MSD Animal Health research on cold water species is done in Bergen. The concentration of expertise in the region attracts global talent and international companies, to the benefit of the local and national economy.

*The concentration of expertise in the region attracts global talent and international companies, to the benefit of the local and national economy.*

## 4. Employment and HR Development

While the number of employees in the international pharmaceutical industry is relatively modest compared to other sectors within the Norwegian economy, on average employees are highly educated and specialized. Workplaces in MPCs provide high levels of training and provide opportunities for international knowledge exchange, networking and travel. This section outlines the number and type of jobs in the sector as well as the socio-economic benefits of these workplaces. These benefits include the development of international-level expertise locally and provide the experience and networks necessary to set up new innovative Norwegian businesses.

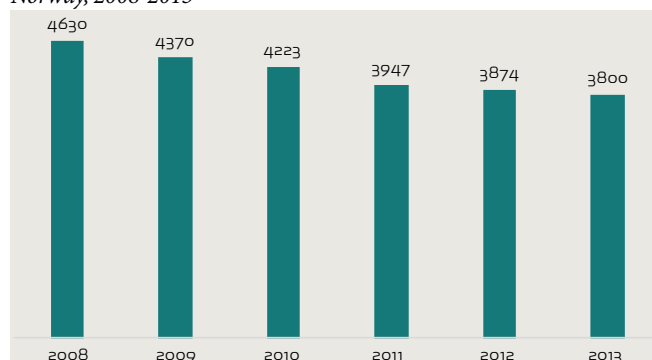
### Direct Employment

According to data from the European Federation of Pharmaceutical Industries and Associations (EFPIA), 3 800 individuals worked in pharmaceutical companies in Norway in 2013. The number of employees in the pharmaceutical sector in Norway has declined by an annual average of 4 percent since 2008 (Figure 5). According to our survey, 17percent of those employed in the pharmaceutical sector are engaged in research and development, equivalent to 646 employees.

Norway has a relatively low number of jobs in the pharmaceutical sector compared to other European countries when adjusted for population size (Figure 6).

While the majority of the offices of the international pharmaceutical companies are based in Oslo, a significant number of workplaces are spread across the country and located in smaller towns, especially for the companies with production in Norway.

Figure 5. Number of employees in the pharmaceutical sector in Norway, 2008-2013



Source: European Federation of Pharmaceutical Industries and Associations (EFPIA). Figure for 2012 is an estimate

Figure 6. Number of employees in the pharmaceutical sector per million inhabitants, 2013



Source: European Federation of Pharmaceutical Industries and Associations (EFPIA).

*Norway has a relatively low number of jobs in the pharmaceutical sector compared to other European countries.*

*International pharmaceutical companies collaborate with start-ups in later phases of development to help organize clinical studies and bring products to the market.*

### **Indirect Employment**

The pharmaceutical sector indirectly creates a significant number of jobs. In addition to core staff, survey estimates suggest that at least 20 percent more staff work in ancillary roles within the sector. Furthermore, the sector creates a significant number of jobs along the supply chain, most importantly in manufacturing jobs linked to MPCs.

MPCs also support a number of jobs created by new innovative start-ups. The international pharmaceutical companies collaborate with start-ups in later phases of development to help organize clinical studies and bring

products to the market. In many cases, MPCs actively look for new collaboration opportunities through networking events. As well as collaborating with Norwegian start-ups, many founders of Norwegian start-ups were themselves previously employed by MPCs. At least 65 percent of pharmaceutical and biotech start-ups registered with Start-up Norway<sup>7</sup> have key staff who previously worked for MPCs<sup>8</sup>. These two factors suggest that the international pharmaceutical companies have an important role in the start-up scene in Norway, which creates a significant number of high quality jobs and leads to the development of new treatments and therapies that benefit Norwegian society.

<sup>7</sup> Start-up Norway is a networking organization that promotes start-ups in Norway.  
<sup>8</sup> 13 of 20 that had available information



### **CASE STUDY NEXTERA AND JANSSEN BIOTECH COLLABORATION**

Nextera, a Norwegian biotechnology company, focuses on developing novel and highly disease-specific immunotherapies for autoimmune diseases, cancer and chronic infections. It entered into a research agreement with Janssen Biotech, Inc., one of the Janssen Pharmaceutical Companies of Johnson & Johnson, in September 2015.

Under terms of the agreement, Nextera will, with the use of its unique technology platform, undertake certain verification studies to determine the applicability of Nextera's technology platform within rheumatoid arthritis (RA).

Janssen will fund the research program, and will have an option for an exclusive worldwide license to the Nextera technology platform within RA.

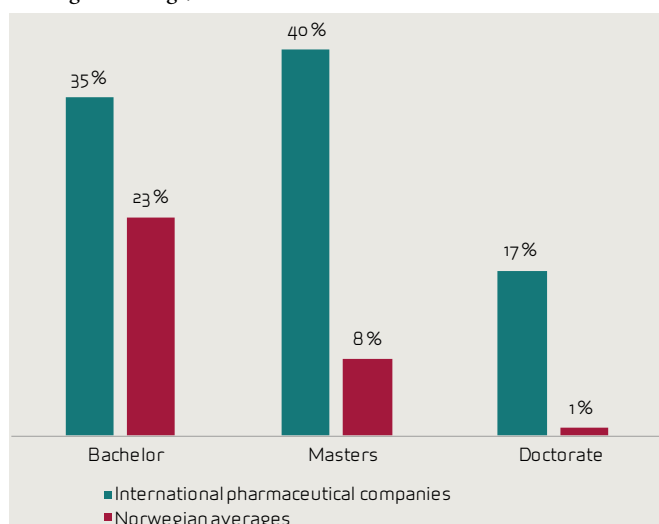
Over 92 percent of employees in MPCs have a bachelor degree or higher, compared to the Norwegian average of 32 percent

### Employee Profile

Employees in the International pharmaceutical sector have a significantly higher average level of education than the general workforce in Norway. Over 92 percent of employees in MPCs have a bachelor degree or higher, compared to the Norwegian average of 32 percent (Figure 7). The number of advanced degrees in MPCs is also significantly higher, with 40 percent of staff having a master's degree and 17 percent a doctorate vs. the Norwegian average of 8 and 1 percent, respectively.

International pharmaceutical companies attract individuals with very specialized training. This can be an important factor for utilizing the human capital that is developed by the Norwegian education system. Furthermore, MPCs bring experience and best practices from abroad, and build upon international networks in Norway.

Figure 7. Highest education completed, shares of MPC staff and the Norwegian average, 2014



Source: Survey of 14 leading multinational pharmaceutical companies in Norway and Statistics Norway



### CASE STUDY LYTIX BIOPHARMA

After gaining extensive senior management experience with the international pharmaceutical company Roche, Ms. Unni Hjelmaas established the innovative company Lytix Biopharma. With a staff of 14, the firm is based in both Tromsø and Oslo. Ms. Hjelmaas worked for Roche in a number of global leadership roles, including General Manger of Operations in Norway.

The technology developed by Lytix Biopharma is a new class of cancer immunotherapy that activates the patients own immune system. Lytix Biopharma's strategy is to develop its drugs to the end of Phase II (see Figure 12), and then collaborate with partners for the final stages of product development and commercialization. Lytix is an example of an innovative Norwegian company with key staff that has experience from international pharmaceutical companies.

The multinational pharmaceutical sector has a high level of productivity.

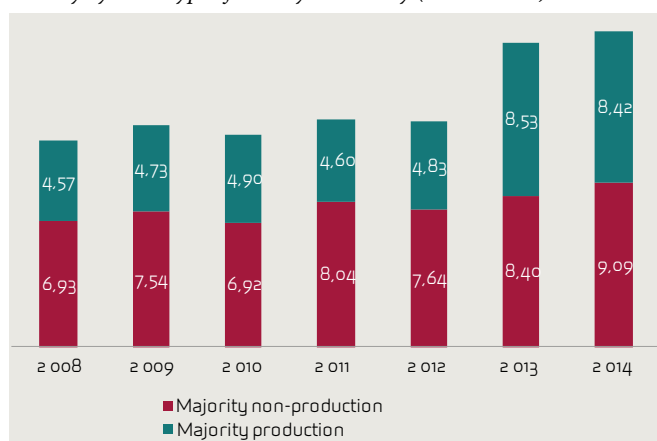
## 5. Economic Impact

This section provides estimates of the direct economic impact of the pharmaceutical sector on Norway by looking at revenue, value added and productivity. It concludes by examining Norway's pharmaceutical trade balance in comparison with other European countries.

### Total Revenue

The total revenue for the international pharmaceutical sector in Norway in 2014 was NOK 17.51 billion. For comparison, this is approximately two percent of total revenue in the manufacturing sector in Norway. MPCs that do not make the majority of their revenue from production in Norway have experienced moderate growth over the last seven years, with an average annual growth rate of five percent. Following nearly flat growth in the years prior, MPCs making the majority of revenue from production in Norway increased their revenue from 2012 to 2013. It should be noted that this change is due primarily to the increase in revenue of one bio-tech company, Thermo Fischer (Life technologies).

Figure 8. Total revenue of multinational pharmaceutical companies in Norway by main type of activity in Norway (NOK billion)



Source: Accounting data from Proff Forvalt, own calculations. Inflation adjusted, expressed in 2014 prices.

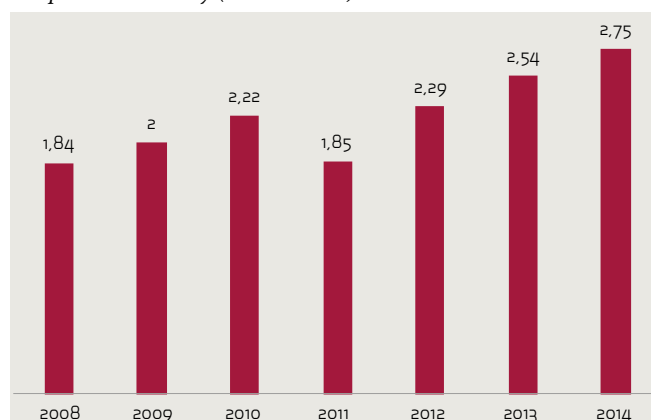
Note: "Majority production" refers to MPCs where more than half of revenues generated are from production activities in Norway. There can be number reasons behind changes in revenue figures in addition to increased sales, such as for example mergers and acquisitions. A full evaluation of the drivers behind the revenue figures is beyond the scope of this project.

### Value Added and Productivity

Value added is the difference between the value of goods and the cost of materials or supplies that are used in producing them. The value added by MPCs in 2014 was NOK 5.97 billion and has remained relatively stable with an average growth of four percent for the period between 2008 and 2014.

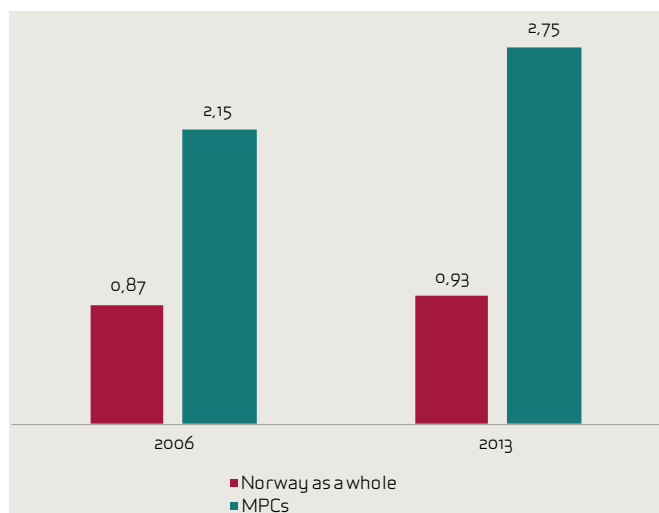
The multinational pharmaceutical sector has a high level of productivity. Productivity is defined as value added per employee. It is a good indication of how well companies use their resources and indicates economic impact per employee. Value added per employee in 2014 was NOK 2.75 million (Figure 9). Productivity has increased steadily over the last seven years with the exception of 2011. The average growth in productivity for the seven-year period is six percent. Figure 10 shows the value added per employee by MPCs compared to the average for Norway for 2006 and 2013, the years for which national level data is available. The figure shows that productivity among MPCs is more than twice as high as the Norwegian average. Productivity increased significantly for the economy as a whole as well as the MPCs between 2006 and 2013.

Figure 9. Value added per employee, multinational pharmaceutical companies in Norway (NOK million)



Source: Accounting data from Proff Forvalt, own calculations. Inflation adjusted to 2014 prices

Figure 10. Value added per employee, MPCs and Norwegian average (NOK million)



Source: Statistics Norway, accounting data from Proff Forvalt, own calculations. Inflation adjusted 2014 prices.

### Pharmaceutical Trade Balance

Like many other countries with small to medium populations, Norway imports a substantial amount of pharmaceutical and medical equipment for use in its health care system. The market for pharmaceutical products is global with many countries importing a significant amount of the pharmaceutical products used domestically. Norway exports less pharmaceuticals than it imports, resulting in a negative trade balance of over € 883 million (Figure 11). As shown in the figure below, the trade balance in pharmaceuticals varies significantly between countries and, compared to other European countries, Norway lies below the average. The pharmaceutical trade balance is lower than in other countries of similar or smaller size such as Denmark, Ireland and Slovenia. Amongst the Nordic countries, Finland is the only other country with a negative trade balance.



## CASE STUDY PHARMACEUTICAL

### PRODUCTION IN NORWAY

While starting from a low base, pharmaceutical production has increased in Norway over the last years. Nine companies in Norway produce pharmaceuticals and medical products. These pharmaceutical companies employ approximately 2000 people and export products worth NOK 6 billion to 130 countries<sup>9</sup>. These companies consist of multinational production companies that have located in Norway and domestic companies that produce pharmaceutical products for MPCs.

Most of the pharmaceuticals produced in Norway require highly specialized production conditions. This means that MPCs with production in Norway invest in training in skilled applied work, most of which occurs outside of the main cities. For example, GE is the biggest employer in Lindesnes (a small municipality in southwest Norway) creating 350 direct jobs. In addition to these direct jobs, the manufacturing site generates indirect economic activity to the benefit of the local community.

<sup>9</sup> Source: LMI. Tall og Fakta 2015

*Given the right conditions, the pharmaceutical sector could become a cornerstone for the Norwegian economy, creating low carbon, high quality jobs that contribute to the health of the human and animal population.*

## 6. Possibilities for Development and Growth

Multinational pharmaceutical companies provide significant benefits to the Norwegian economy and society in a number of important ways. MPCs develop and manufacture the majority of medicines used in Norway today. They make considerable investments in research and development and actively collaborate with local companies to bring innovative products to the market. They are large, attractive employers in the pharmaceutical sector and provide local job opportunities with international responsibilities. The current government of Norway emphasizes the need for new areas of advanced industries to augment the stagnating petroleum industry. Pharmaceutical innovation represents an obvious way for Norway to keep its place as an advanced country with high living standards and a good welfare system.

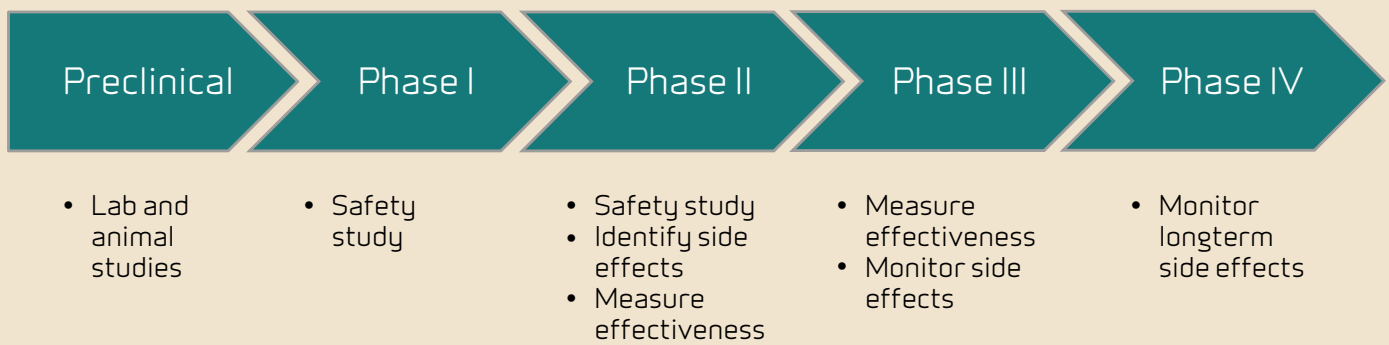
While the benefits of the industry's presence in Norway are significant, the size of the sector is modest when compared to other European countries. The average level of innovation in MPC is more than double that of the Norwegian average, but investment in innovative pharmaceuticals is well below the European average. In fact, it is the lowest of all the Nordic countries.

While the education and training levels of staff in the sector are well above the average in Norway, per capita employment is among the lowest out of all European countries.

Norway already has many of the necessary features to develop this sector in line with other countries in Northern Europe (e.g. Denmark, Sweden and Germany). In its National Research and Innovation Strategy on health and care for the 21st Century, the Ministry of Health identifies the need for more investment in health innovation and in improved support for bringing new products to the market, a strategy in which MPCs have a crucial role to play. However, in order to attract increased investment, Norway needs to actively promote the sector and reduce the barriers of doing business in the country. This is important as the competition for clinical trials, investment in innovation and production is global. Given the right conditions, the pharmaceutical sector could become a cornerstone for the Norwegian economy, creating low carbon, high quality jobs that contribute to the health of the human and animal population.



Figure 11. Clinical Trial Phases





[www.bi.no](http://www.bi.no)

oslo**economics**

[www.osloeconomics.no](http://www.osloeconomics.no)