KPMG

Site Selection

for Life Sciences Companies in Europe

In association with

VENTURE VALUATION

EuropaBio
The European Association for Bioindustries

June 2016

kpmg.ch

Table of content

Foreword	04
Scope of the report	06
Key findings	07
Sources of data and sector categorization	11
Life Sciences clusters in Europe	13
Business environment and agility	21
Taxation and incentives	38
Our approach: Value Chain Analysis (VCA) and Site Selection	46
Finance environment	49
Regulatory environment	52
Country quick facts	56

Foreword

Following the positive reception of our Site Selection reports in 2013 and 2015, KPMG's Global Location & Expansion Services (GLES) is delighted to present this extended 2016 version in association with EuropaBio, the European Association for Bioindustries. Crucially, this edition covers additional countries and topics that are highly relevant to any Life Sciences (LS) business wishing to be active in Europe.

Business transformation ranks prominently on corporate agendas. According to our research, a staggering 93% of US-based multinational companies are in the process of changing their business models[1]. This is especially true of the LS industry where, after years of stripping out supply chain costs by reducing inventory and improving efficiencies, companies must now turn their attentions to strong growth, new market entry and the benefits of multi-channel distribution. Securing sustainable businesses by seizing these opportunities – and mitigating the associated risks – explains LS businesses' needs to transform their business models and optimize their value chains. The objective? To enhance their **capability, agility** and **value** – critical considerations, as demonstrated by our latest study on the LS supply chain[2].

Regulation of course plays its part in driving transformation, not least the OECD's efforts to limit so-called **Base Erosion and Profit Shifting** (BEPS). The effect is particularly acute on LS businesses, which need to closely **align the location where value is created with the resources needed to produce that value**[3].

A detailed review of the business's value chain is central to this effort, including a close look at value drivers such as operational excellence, manufacturing, sales and marketing, research and development (R&D), branding and procurement and supply chain. The aim of revisiting these areas is to review their current locations and where they might be positioned in the future, and how they interact with each other and the external environment. This is necessary when seeking an optimal transformation of the business model.

Fertile ground for LS can be found in Europe, which offers a valuable base for the manufacturing, R&D and sale of LS products. As a recent joint KPMG – CB Insights[4] survey confirms, comparatively low valuations make Europe an increasingly attractive proposition for foreign investors, – particularly US venture capital firms.

This report contains **data** from Venture Valuation on the **size and focus of Europe's various LS clusters**. Through cooperation with the EuropaBIO network, it also includes insights from LS experts across EuropaBIO's member countries national biotech associations.

We hope you find this report insightful, and we would be delighted to discuss the implications of our findings for your own business in these complex and challenging times.

Hartley Powell
Principal, Global Head
Global Location and Expansion Services
KPMG in the US

André Guedel
Head Sales and Business Development Tax
KPMG in Switzerland

[1] Business Transformation and Corporate Agenda, KPMG 2015
[2] Fast Forward – Future proofing the life sciences supply chain, KPMG 2015
[3] The post Base Erosion and Profit Shifting world, KPMG 2014
[4] KPMG CB Insights Unicorn Report, 2015

Scope of the report

This report provides senior executives of Life Sciences (LS) businesses (Pharmaceutical (Pharma), Biotechnology (Biotech) and Medical Devices (Medtech) and investors with data on the various LS clusters in Europe, including their capacities to host crucial value drivers. It summarizes the European LS landscape and its regional strengths in areas such as distribution, research & development (R&D), manufacturing and regional headquarters / shared services activities.

Geographic coverage

The report provides details on the following European countries that have significant LS industries: Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Spain, Sweden, Switzerland and the United Kingdom. Further countries such as Austria, Israel, Luxembourg, Norway and Portugal are also partially covered in this report.

Section 1: LS clusters

In order to **develop new capabilities** for coping with the changing LS environment, LS companies need to strengthen collaboration with peers, universities and suppliers. Marketing internal assets and expertise to third parties is a growing strategy among LS companies. **The first section** of the report therefore focuses on **clusters of LS companies**, providing insights into the number, size and specialization of the LS industry in the given countries. This analysis also includes detailed overviews of product pipelines and shares insights into existing regional and global headquarters (HQs). This part of the report is based on data from the global Biotechgate database (www.biotechgate.com).

Section 2: General business environment

The second section of the report deals with the **general business environment** in the covered countries with regard to the speed and sustainability of business transformation. In particular, it keeps in mind the prospect of enhancing **agility to react quickly to changes** arising from variations in demand, disruptive technologies or volatility of markets, prices and supply. Countries are compared to show how easy it is to transform business in light of the labor force, flexibility of labor law, legal requirements and other key considerations.

Section 3: Tax environment

How a country sets its tax planning and incentive models can greatly impact **investment values** in that country. This is especially true for intellectual property (IP)-driven industries such as LS. **The third section** of the report therefore provides an overview of the tax environment and incentives of each country. Critical in this regard are current changes in international tax planning as required by the OECD's BEPS initiative. As most countries that appeal to LS tend to offer attractive tax planning models, it is important to analyze how governments are responding to these new regulatory requirements vis-à-vis existing and new investments from abroad.

The report should assist executives and their advisors in shortlisting potential target countries for building or shifting key value drivers in Europe. Further detailed analysis will be necessary to reach a final decision. It is important to note that many aspects discussed can also be used for other knowledge-driven industries such as Information and Communications Technology (ICT), MEMS (Microelectronic and Mechanical Systems), nutrition and food, aerospace and chemicals, among others.

The report ends with an introduction to business transformation and value chain management as an efficient tool to identify key value drivers in the LS industry and to help determine the vital site selection factors that influence productivity.

Key findings

When seeking fast and sustainable growth, it is essential that companies find a business environment that afford agility – particularly when adjusting business models amid rapidly evolving technologies and markets. The factors that influence this flexibility – and which enable greater productivity and sustainability – vary greatly between the countries covered in this report. Reaching the right site selection decision involves carefully balancing each prospective location's pros and cons and how these might impact a given company's circumstances and objectives.

The following countries were selected to be covered in detail in this report due to being the leading recipients of LS investments in Europe: Belgium, France, Germany, Ireland, the Netherlands, Switzerland and the UK. The remaining countries - Denmark, Finland, Italy, Norway, Spain and Sweden - also have attractive LS clusters but have not yet attracted the same levels of Foreign Direct Investment (FDI) as the former countries.

We set out below some of the key factors to consider in site selection for LS:

- **Rankings** from leading organizations in assessing competiveness and economic freedom place Switzerland as the most competitive country in Europe. Globally, the UK, the Netherlands, Ireland, Germany, Sweden and Finland are also ranked in the top 10 in one or more league tables from the World Economics Global Competiveness report, the Heritage Foundation's Index of Economic Freedom and the IMD's World Competitiveness Yearbook.

- Switzerland, Sweden, Denmark, Finland and Germany are the most **innovative** countries according to the European Innovation Scoreboard.

- Strong macroeconomic data in Germany and Switzerland are complemented by exceptionally strong labor productivity. Germany has the highest **labor productivity** in Europe, followed by Switzerland.

- Ireland's **macroeconomic situation** has improved, enabling the country to considerably lower its unemployment rate to below 10% and achieve a positive current account balance. This helps improve future economic stability.

- France, Germany, Italy, Spain and Belgium offer competitive **salaries**. The Netherlands, Denmark, Sweden, Norway, Finland, the UK and Ireland are in the mid-range, while Switzerland has the highest average salaries.

- **Annual wage growth** over the next five years is expected to be highest in the UK, Germany and Ireland, medium in the Netherlands, France and Belgium and lowest in Switzerland.

- Switzerland, Denmark, the UK and Ireland have the most business-friendly **labor markets and labor regulations**, particularly for hiring and firing practices.

- The UK has by far the most **universities** (9) in the global top 100, followed by France, Germany, Switzerland and the Netherlands (4 each).

- All countries covered in the report have at least one international airport with good to excellent direct **flight connections** to other major international LS clusters. London tops the list as having the airport with the most connections. In terms of air transportation infrastructure (quality/reliability of services), the Netherlands leads the group. Finland, France and Switzerland are top in high-speed rail connections.

- For **standard of living**, Germany and Switzerland have the most cities ranked in the top 40. In terms of environmental protection, Switzerland, Spain, Sweden, Germany and the Netherlands are particularly well positioned.

- London, Zurich and Geneva are among the most expensive cities in the world, whereas the **cost of living** is much lower in Belgium, the Netherlands, Germany and France. However, inhabitants of Switzerland, France and Belgium have a much higher purchasing power than those in the other countries.

- Attracting, retaining and developing **talent** is essential for a successful business location. Switzerland, the UK, the Netherlands and Germany are especially strong in putting in place educational systems that meet the needs of industry. Switzerland and the UK are the biggest magnet for foreign workers.

- Germany, Denmark, Finland, Sweden and Italy appear in the top 10 of the **Global Cybersecurity Index** ranking.

Collaboration with suppliers, peers and/or academic institutions is a key factor for LS companies to expand their capabilities along the value chain from R&D to manufacturing to distribution. There are significant differences between the various LS clusters (size, workforce, specialization, etc.) in countries covered in this report. The number of products in development may also be an important consideration for site selection decisions, as well as the ease of raising capital and tax benefits and incentives.

Belgium

Belgium has a sizeable Pharma sector (74 companies), which is fourth among the countries in scope. It has a reasonable number of Biotech companies (265), though very few are focused on drug development.

- With 135 Medtech companies, Belgium is in the middle of the field. Interestingly, almost 60% of LS companies in Belgium manufacture in the country – this is the highest proportion in Europe. Of these companies, 32% undertake R&D here. It should be noted that pharmaceutical R&D centers located in Belgium account for one-fifth of the total worldwide R&D expenditures by those companies.
- Belgium also proves an attractive location for regional HQs (23) while it hosts 36 global HQs. International LS groups use it as a hub to serve the Benelux countries (Netherlands, Belgium and Luxembourg). Belgium also has a comparatively high density of Pharma companies.
- The country was able to attract a promising, fast-growing company when Biocartis moved its HQ to Belgium. Biocartis raised around USD 83 million in 2014, representing almost two-thirds of the money raised by private Belgian LS companies that year. The country's LS product pipeline is rather weak on early stage products compared with its peers.

Denmark

- Denmark has a high ratio of innovative, Biotech therapeutic companies to the number of total Biotech companies. This is demonstrated by recent IPOs (5 in 2014 and 2015).
- The absolute number of companies is still relatively small but, per capita, the LS industry is an important economic factor for Denmark.

Finland

- Finland is in the process of building its LS industry, with currently one of the lowest number of companies.
- Financing into LS has increased during recent years (except 2013).
- An IPO in 2015 of a company from the Turku region serves as a role model of what is possible.
- Finland has the highest percentage of companies offering research on a contract basis.

France

France has a strong LS sector, especially in Biotech and Pharma. Both have a certain focus on the cosmetics, food and environmental sectors and a strong focus on R&D within the country. In terms of Medtech companies, France is in the middle of the field. Many French companies offer R&D on a contract basis, indicating innovative capabilities and lower risk. France is home to many global and regional HQs of firms that also manufacture in the country.

- France has the third largest number of products in development, with a heavy focus on early stage products, particularly in oncology, though the country is weaker in clinical stage products where its focus is more on infectious diseases.
- France has seen the most IPOs in Europe since 2007 with 34 companies raising money from the public market. Earlier in 2015 France-based Biopharma companies Cerenis and OSE Pharma went public. However, the capital raised by private companies in France was below the European average (USD 225 million in 2014 for Europe).
- France also has the most products in pre-clinical development.

Germany

The largest country in Europe also has the greatest number of LS companies. German companies focus more on services, diagnostics and environmental. Medtech numbers are very strong, with a large number of innovative SME companies. These companies are often active globally, translating into a high number of global HQs. Other features of the German LS ecosystem include the largest number of Biotech companies, though less so in terms of Biotech therapeutics.

- Germany has the second highest number of Pharma companies.
- Highest percentage of global HQs with manufacturing in-country.
- There is an emphasis on manufacturing but less on local R&D, which comes back to the more service focus of the Biotech companies.
- German companies have strong pre-clinical and clinical pipelines of new products in development, with a strong focus on oncology.
- Since 2007, Germany had relatively few IPOs at eight, meaning funding for public companies is on the low side. Financing for private companies, however, was the third highest in Europe in 2014, behind the UK and Switzerland.

Ireland

Although Ireland has the smallest number of LS companies among the 15 countries covered, it is an attractive hub for overseas groups. There is rather little in terms of SME Biotech activity. Despite a focus on attracting multinationals,

the number of global and regional HQs shows Ireland at the bottom of the group of the countries covered.

- More than 50% of LS companies in Ireland undertake R&D here, though the sector also enjoys a focus on manufacturing. The small number of companies leads to a pipeline that is also one of the smallest among the evaluated countries, with an especial lack of early stage projects.
- Ireland was able to increase its private company financing significantly from USD 39 million in 2012 to USD 108 million in 2014.
- In terms of funding for publicly listed companies, Ireland is top of the list with almost USD 1 billion in 2014 and more than USD 2 billion in 2015. This high amount is principally due to Endo International, which raised USD 2.7 billion in equity and debt over 2014 and 2015.
- Another major event was the acquisition of Irish Covidien by US group Medtronic and the relocation of Medtronic's HQ to Dublin. In June 2015 Johnson & Johnson Vision Care announced an investment of more than EUR 100 million to expand its manufacturing operations at its site in Limerick's National Technology Park.
- 83% of regional HQs focus on supply and distribution, but there is also a high manufacturing focus.
- Ireland has a small development product pipeline, especially pre-clinical.

Italy

- Italy has a high number of LS companies and a particular strength in regional, mid-sized Pharma companies such as Chiesi Farmaceutici Spa or Menarini Group, which have a strong European focus but have also expanded internationally.
- There is a strong oncology focus with more than 70 projects in pre-clinical development.
- The industry has seen relatively modest investments, especially in innovative therapeutic companies.
- Italy has a very high percentage of companies that focus on manufacturing and R&D.

Netherlands

The Netherlands has a strong LS cluster focused on Biotech services. These companies offer a broad range of services, though manufacturing is performed by 39% of LS companies here, and R&D by only 42% (which is about the European average). In terms of global and regional HQs, the Netherlands has a similar number to Belgium and more than Ireland, but is behind France, Germany, Switzerland and the UK. As with Belgium, a high percentage of regional HQs focus on supply and distribution.

- Due to a greater emphasis on Biotech services, the pipeline – especially clinical – is rather weak. Oncology and Central Nervous System (CNS) are main focus areas.
- The Netherlands is also strong in diagnostic and rare diseases.
- For public companies however, the Netherlands had a particularly strong 2014 when Qiagen raised debt and uniQure carried out an IPO.

Spain

- A pre-clinical pipeline of more than 200 projects and the R&D focus of the majority of companies (51%) shows potential and focus for innovative therapeutic companies.
- Spain has a strong local, mid-sized Pharma industry.
- There has been decreasing investment since 2009, demonstrating Spanish companies' difficulty in raising money.

Sweden

- Sweden has seen a significant investment of between USD 100 million and USD 200 million in LS companies every year since 2011.
- There is a high number of companies with strong Medtech and Biotech therapeutic sectors.
- The product pipeline compared to the number of companies is rather small, due to fewer Pharma companies.

Switzerland

Traditionally strong in LS and fueled by the two Pharma giants Novartis and Roche, Switzerland has a keen focus on innovative therapeutic Biotech companies but also a strong Medtech sector. Aside from the two giants noted, the country has an average number of Pharma companies, however. Despite the presumed high cost, many companies carry out R&D and manufacturing in Switzerland.

- The country is home to a high number of global HQs. In addition, there are many regional HQs situated in Switzerland that focus on supply and distribution for Europe and often Europe, Middle East and Africa (EMEA). Swiss companies have strong product pipelines that emphasize clinical products, particularly oncology.
- Switzerland performs strongly when it comes to financing private companies, raising the second highest amounts in 2014 and 2015 behind the UK. It is a less impressive picture for publicly listed companies, however, with only a few launched on the stock exchange since 2007.
- In May 2015 Biogen Inc. announced it will invest USD 1 billion in a new manufacturing plant in northern Switzerland that will triple the company's global capacity to produce large protein-based drugs known as biologics. In June 2015 Ludwig Cancer Research announced it is opening a new branch in western Switzerland which will focus primarily on applied cancer immunology and the design of novel molecular and cell-based immunotherapies.

- Switzerland is the fourth strongest Medtech country in Europe with one private company raising USD 180 million in 2015 alone.
- There is a high number of Biotech and Biotech therapeutic companies relative to the country's size.

United Kingdom (UK)

The UK has the second highest number of LS companies in Europe, but the highest number of innovative companies in Biotech therapeutics. The UK also leads in Pharma companies. Surprisingly however, only 40% of the companies undertake R&D in the UK and only 35% manufacturing.

- The UK has the most regional HQs and the second most global HQs among the countries covered. For products in development, the UK has the strongest pipeline in Europe, with an emphasis on pre-clinical and a strong showing in clinical (primarily oncology).
- UK companies were able to raise record amounts in 2014 and 2015: Public companies raised more than USD 2 billion in 2014. Privately owned companies have consistently raised more than USD 400 million each year since 2011.
- One private biotech therapeutic company raised USD 320 million in 2015 alone.

How does it compare to the Bay Area?

The Bay Area has roughly the same number of LS companies as Switzerland, the Netherlands or Sweden. The proportion of innovative Biotech therapeutic companies is higher in the Bay Area, however, at around double that of the leading European countries. In terms of financing, private companies in the Bay Area raised around the same amount as the whole of Europe (from 2007 to 2015). The same is true for public companies. The pipeline in the Bay Area is similar to Switzerland, France, Germany or the UK. The existence of fewer Pharma companies, however, means the focus in California is more on early state, pre-clinical products. More companies have gone public (IPO) in the Bay Area, but the difference is not as significant as with financing.

Products in development

The UK has the most products in development, followed by Germany, France and Switzerland. The pipelines of LS companies in Sweden, Denmark, Belgium Spain, the Netherlands and Italy are about one third of the ones in the UK. Finland, Norway and Ireland have the smallest pipelines in the group.

Financing

There are substantial differences between locations when it comes to raising capital. For privately owned LS companies, Germany, the UK and Switzerland appeared to be the best places to raise money in 2014 and 2015. These three accounted for 86% of European LS financing. For financing of publicly listed companies, Ireland and the UK are followed by France, the Netherlands and Belgium. This is due to the large number of publicly held companies in these countries compared to Switzerland and Germany and also based on one-time effects from single transactions.

Taxes and incentives

Intangible assets play a crucial role in LS and it is essential to consider in forward-looking planning the development and exploitation of IP in the form of patents, technology and trademarks. All countries in the report - with the exception of Germany – have or are planning to put in place systems that offer beneficial tax treatments of income from IP or incentives for R&D. Given the ongoing developments with regard to BEPS, however, these measures might be subject to significant change.

Sources of data and sector categorization

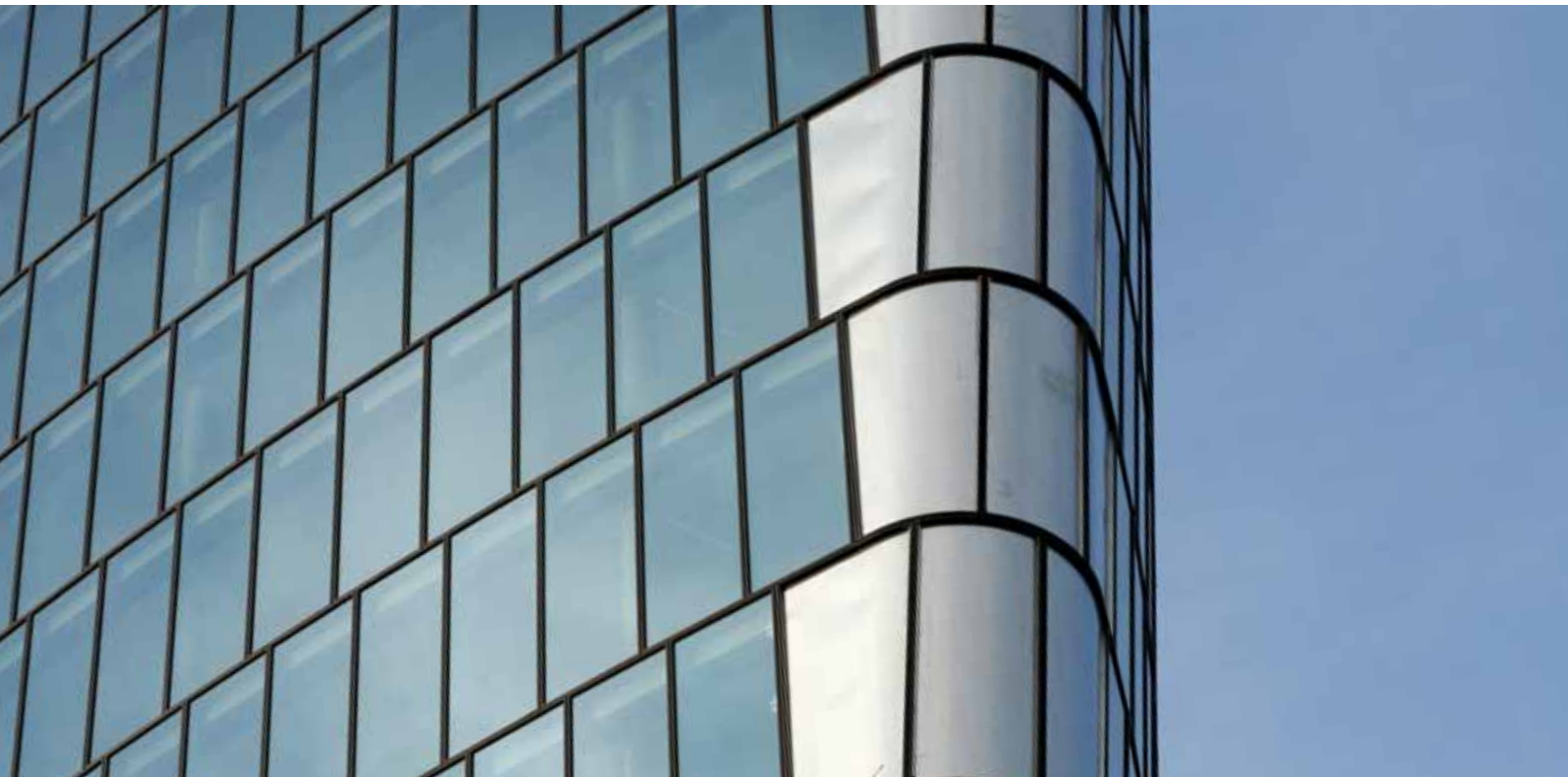
For this report, Venture Valuation analyzed data for the year 2015 based on its Biotechgate database (www.biotechgate.com), which contains information on more than 36,000 LS companies, products, financing rounds, company valuations and management details. This report utilizes a categorization system for LS that was developed for the global Biotechgate database. According to this definition, the LS industry includes:

Biotechnology companies (Biotech)
Biotechnology companies are those that employ living organisms or biological substances for the development of products and services with applications in numerous fields such as waste management, food processing, agriculture and pharmaceutics. An important sub-segment of Biotechnology companies is **Biotechnology therapeutics**, the core business of which is the application of Biotechnology to the discovery and development of novel therapeutic compounds for applications in medicine and diagnostics. Biotechnology companies also include companies that apply biotechnology for services such as screening, analytical services, bioinformatics, manufacturing, agriculture, nutraceuticals, veterinarian and cosmetics[5].

Pharmaceutical companies (Pharma)
Pharmaceutical companies are commercial enterprises that research, develop, produce and sell drugs and other medicines. These enterprises are typically large and deal both in branded and generic compounds. They rely, at least in part, on smaller Biotechnology companies for the in-licensing of novel compounds for their pipelines.

Medical technology companies (Medtech)
Medtech companies are involved in research, development, production and marketing of systems and devices for medical applications in humans and animals.

[5] A detailed definition of the different sectors and subsectors can be found here: www.biotechgate.com



Glossary

BEPS	Base Erosion and Profit Shifting
CNS	Central nervous system
CRO	Contract Research Organization
EU	European Union
EUR	Euros
GBP	British pounds sterling
GDP	Gross Domestic Product
HQ	Headquarters
IP	Intellectual Property
IPO	Initial public offering
LS	Life Sciences
MNC	Multinational Corporation
OECD	Organisation for Economic Co-operation and Development
PPP	Purchasing power parity
R&D	Research and Development
SME	Small and medium-sized enterprises
sqm	Square meters
USD	US Dollars

Life Sciences clusters in Europe

As a tightly linked eco-system, a successful LS cluster needs thriving and diversified industry players in close proximity. It depends on quality suppliers, financial investments, available human resources, research capabilities and innovation. These are provided by a combination of innovative Biotech therapeutics and Pharmaceutical companies, Biotechnology service companies, Contract Research Organizations (CROs) and Contract Manufacturers and Medtech companies as well as investors and universities. A cluster creates a local pool of talent, expertise and know-how, affording companies the opportunity to outsource non-core tasks while focusing on key value drivers.

This report highlights such regional clusters in various degrees of detail, focusing on three categories that comprise the core of an LS industry: Biotech, Medtech and Pharma.

Number of LS companies

The total number of LS companies analyzed in this report is 10,737, across 14 European countries and Israel. The greatest concentration is in Germany at 1,876, closely followed by the UK at 1,610 and France at 1,112.

For Biotech companies it is the same pattern with Germany at 1,042, the UK at 979 and France at 720, while at the other end of the spectrum, Austria (94), Ireland and Finland (82 each) and Ireland (65) have the fewest.

For Medtech, Germany again leads the way with 572 companies, then Israel (545) and Sweden (301), while those with the fewest are Norway (32), Finland (37) and Ireland (39).

The Pharma industry is largest in the UK with 110 companies being based there, next is Germany with 103 and France with 94.

Number of companies in the LS industry

Country	Biotechnology	Biotech Therapeutics	MedTech	Pharma
Austria	94	40	52	15
Belgium	265	50	135	74
Denmark	137	58	71	10
Finland	82	14	37	10
France	720	138	160	94
Germany	1,042	159	572	103
Ireland	65	18	39	11
Israel	334	154	545	36
Italy	518	59	104	87
Netherlands	409	86	117	40
Norway	120	27	32	8
Spain	421	83	80	60
Sweden	408	115	301	41
Switzerland	346	104	230	47
United Kingdom	979	246	275	110
BayArea	380	214	199	13

Source: www.biotechgate.com, 2016

Number of employees

The country with the most employees in LS is Germany (247,000), followed by the UK (174,000) then France (146,000). This distribution is similar for all three sectors. As a percentage of the total population, Switzerland has the highest number of employees.

Number of employees in the LS industry

Country	Biotechnology	MedTech	Pharma	Total
Belgium	15,000	5,000	40,000	60,000
France	11,000	40,000	95,000	146,000
Germany	37,000	100,000	110,000	247'000
Ireland	6,000	9,000	12,000	27,000
Netherlands	8,000	9,500	9,000	26,500
Switzerland	20,000	45,000	40,000	105,000
United Kingdom	30,000	71,000	73,000	174,000

Source: Estimated by Venture Valuation, 2016

Main activities of LS companies

The main activities of LS companies across Europe show an average of 43% of companies engaging in R&D in their respective country. This ranges from 54% in Ireland to 32% in Belgium. Meanwhile, 45% of companies have a manufacturing focus, ranging from 59% in Belgium to 35% in the UK. The average percentage of European companies involved in research on a contract basis is 10%, being highest in France (13%).

Main activities of life science companies

Country	R&D (% of all)	Manufacturing (% of all)	Research on contract basis (% of all)
Austria	91 (54%)	49 (29%)	16 (10%)
Belgium	170 (32%)	308 (59%)	41 (8%)
Denmark	125 (45%)	100 (36%)	28 (10%)
Finland	55 (42%)	55 (42%)	21 (16%)
France	523 (47%)	479 (43%)	149 (13%)
Germany	696 (37%)	995 (53%)	178 (9%)
Ireland	72 (54%)	68 (51%)	6 (5%)
Israel	476 (45%)	485 (45%)	24 (2%)
Italy	365 (48%)	418 (54%)	39 (5%)
Netherlands	273 (42%)	254 (39%)	71 (11%)
Norway	85 (45%)	67 (36%)	7 (4%)
Spain	329 (51%)	269 (42%)	43 (7%)
Sweden	388 (45%)	411 (48%)	68 (8%)
Switzerland	323 (45%)	327 (45%)	55 (8%)
United Kingdom	652 (40%)	561 (35%)	196 (12%)
Bay Area	448 (76%)	211 (36%)	22 (4%)

Source: www.biotechgate.com, 2016

Number of global and regional HQs

Germany and the UK have the highest number of global HQs of domestic LS companies, followed by France and Switzerland. The number of regional HQs of foreign-owned LS companies is highest in the UK (37) then around 20 in each of Belgium, France, Germany, Switzerland and the Netherlands. Ireland has the lowest number of both global and regional HQs in the cluster. More than 50% of the global HQs also undertake manufacturing in the country in which they are based. In France, R&D and manufacturing are equal at around 63%. The regional HQs also mainly focused on manufacturing (Belgium, France, Germany, Ireland), supplier / distribution (Ireland, Netherlands, Switzerland) and R&D (UK).

Number of global and regional HQs

Country	Global headquarters of domestic LS companies	Main activities in addition to HQ activities	Regional headquarters of foreign owned LS companies	Main activities in addition to HQ activities
Belgium	36	Manufacturing 67%	23	Manufacturing 78%
France	112	R&D / Manufacturing 63%	25	Manufacturing 84%
Germany	158	Manufacturing 77%	25	Manufacturing 76%
Ireland	29	Manufacturing 59%	6	Supply / Distribution and Manufacturing 83%
Netherlands	46	Manufacturing 72%	17	Supply / Distribution 82%
Switzerland	97	Manufacturing 68%	22	Supply / Distribution 64%
United Kingdom	146	Manufacturing 53%	37	R&D 54%
Bay Area	110	Manufacturing 49%	6	Manufacturing (83%)

Source: www.biotechgate.com, 2016

Products in development

The largest focus area of products in development is oncology, especially in the leaders Germany, the UK, Switzerland and France, where oncology predominates. There are some interesting exceptions such as Austria's focus in early development on infectious diseases, while Belgium focuses more on diseases of the musculoskeletal system and connective tissue. Products in late stages of development in Ireland center on cardiovascular diseases and in Spain, Finland and the Netherlands on the central nervous system.

Products in development

Country	Preclinical	Phase I	Phase II	Phase III
Austria	Infectious diseases (15)	Infectious diseases (5)	Respiratory (5)	Respiratory (3)
Belgium	Oncology (18)	Oncology (16)	Oncology (5)	
Denmark	Infectious diseases (26)	Endocrine, metabolic diseases (7)	Musculoskeletal (9)	Oncology (7), Musculoskeletal (7)
Finland	Oncology (6) CNS (6)	Oncology (5)	Oncology (12)	Oncology (5)
France	Oncology (125)	Oncology (24)	CNS (2)	Respiratory (4)
Germany	Oncology (129)	Oncology (94)	Infectious diseases (20) Oncology (20)	
Ireland	Oncology (6)	Digestive system (3)	Oncology (66)	Infectious diseases (8) Oncology (8) Endocrine (8)
Israel	Oncology (20)	CNS (8)	Musculoskeletal (3)	Oncology (20)
Italy	Oncology (73)	Oncology (16)	CNS (17)	Cardiovascular (3)
Netherlands	Oncology (45)	Oncology (13)	Oncology (25)	Oncology (4) Respiratory (4)
Norway	Oncology (21)	Oncology (7)	CNS (5) Genitourinary system (5)	Oncology (4)
Spain	Oncology (47)	Oncology (8)	Oncology (4)	Oncology (4)
Sweden	Oncology (42)	Oncology (9)	Oncology (9)	Oncology (2)
Switzerland	Oncology (46)	Oncology (40)	Oncology (17)	CNS (7)
United Kingdom	Oncology (116)	Oncology (86)	Oncology (29)	Oncology (8)
Bay Area	Oncology (66)	Oncology (38)	Oncology (50)	Oncology (16)

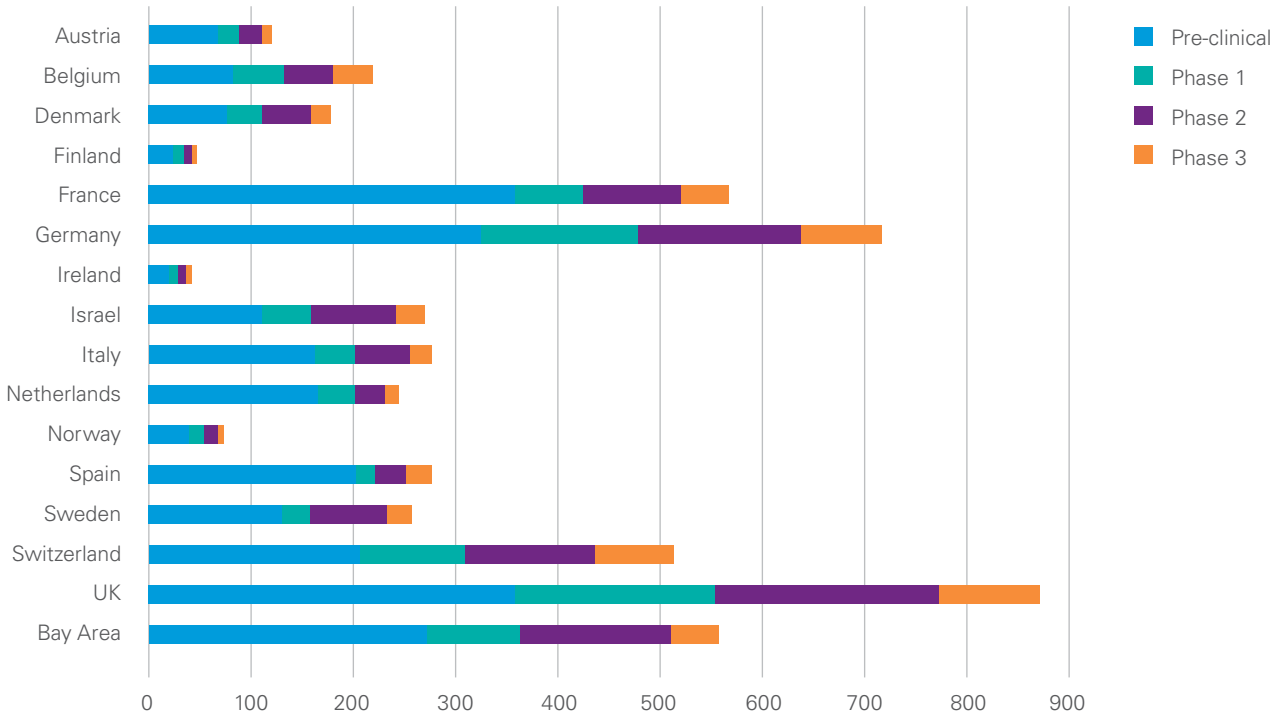
Source: www.biotechgate.com, 2016

Development stages

The UK has the most products in all stages of development, totaling 870. This is followed by Germany (714), France (565) and Switzerland (512). Nearly all countries covered in this report have the highest proportion of products in pre-clinical development, with the percentage falling towards later development phases, as might be expected.

The exception is Ireland, which has a higher percentage of products in the later stage of development than early. The UK and France lead the way in the total number of products in pre-clinical development, whereas France has a lower proportion of products in phases 2 and 3. Finland, Norway and Ireland have the lowest number of products in development generally.

Table: Development stages



Source: www.biotechgate.com, 2016

Alliances with universities

There is notable trend within LS towards forging stronger alliances with universities. Some companies are moving their R&D HQs closer to university sites to promote collaboration and enhance scientific dialogue. This trend is enhanced by the fact that attracting and retaining research talent is challenging, particularly in certain research fields such as CNS and oncology. Proximity to a location with strong research faculties and an affinity for innovation is advantageous.

Rankings comparing universities can help in assessing a country's academic level. **The Academic Ranking of World Universities (ARWU)** uses six objective indicators including the number of alumni and staff that have won Nobel Prizes and Fields Medals, the number highly cited, the number of articles published in journals of Nature and Science, the number of articles indexed in the Science Citation Index - Expanded and Social Sciences Citation Index, and a university's per capita performance. More than 1,200 universities are ranked by ARWU annually, with the best 500 being published. The UK clearly leads in terms of top ranked universities, but smaller countries such as the Netherlands, Belgium and Switzerland have a higher number per capita.

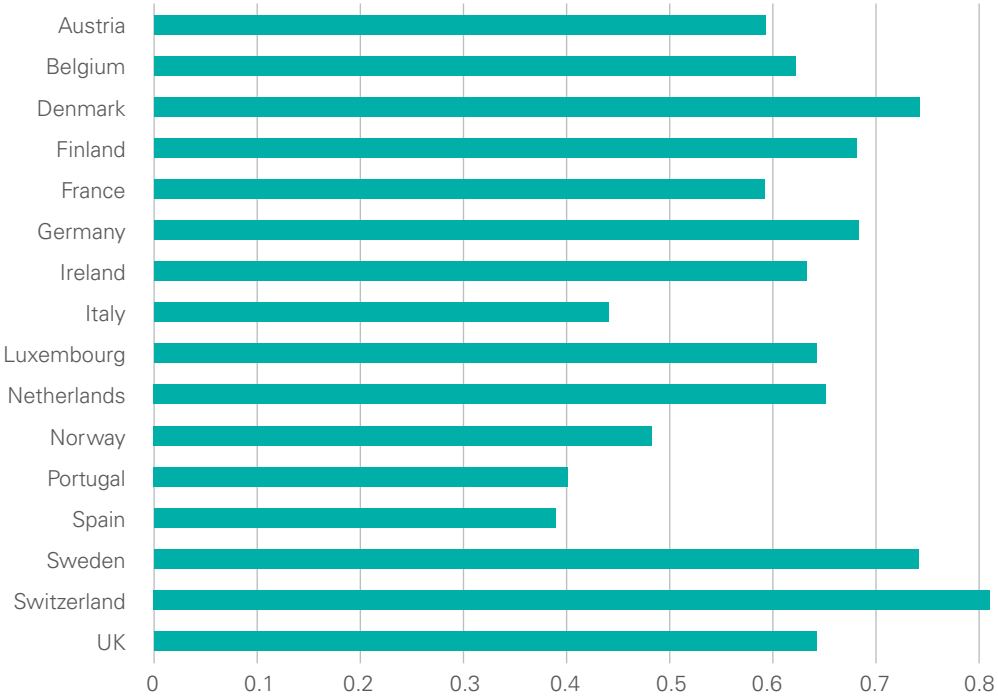
University rankings

Country	Number of universities in top 100	Number of universities in top 200
Austria	0	1
Belgium	2	4
Denmark	2	3
Finland	0	1
France	4	8
Germany	4	13
Ireland	0	1
Italy	0	5
Luxembourg	0	0
Netherlands	4	8
Norway	1	2
Portugal	0	0
Spain	0	1
Sweden	3	5
Switzerland	4	6
UK	9	21
Israel	2	4
US	51	78
Singapore	0	2

Source: http://www.shanghairanking.com/ARWU-Statistics-2015.html#2

Conducting R&D does not necessarily create an innovative business environment. The **European Innovation Scoreboard compares** the capacity of EU and non-EU countries to generate innovation-driven economic growth. The 2015 report provides a comparative assessment of the innovation performance of European countries and the relative strengths and weaknesses of their research and innovation systems.

European Innovation Scoreboard



Note: Figures are normalized scores (from 0 to 1) - Range from 0 to 1 **Source:** Innovation Union Scoreboard 2015 (based on year 2014) http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards/files/ius-2015_en.pdf

According to the 2015 study of the European Innovation Scoreboard, Switzerland and Germany (along with Sweden, Finland and Denmark) are "innovation leaders" with an innovation performance well above average, while the UK, France, Ireland , Belgium and the Netherlands are "innovation followers" with an innovation performance closer to the average of all European countries.

Business environment and agility

The ability to adjust quickly to an evolving business environment and new technologies requires an agile organizational set-up and structure. But that's not all. Of equal importance to such internal considerations are that external factors should allow agility – in other words, the certainty of stable yet sufficiently dynamic business conditions.

Differences between European locations' business environments can be grouped into **flexibility factors, productivity factors and sustainability factors.**

Flexibility factors

Scalability of qualified workforce

Labor force scalability and flexibility is the clear number one factor when determining whether a location is ready to welcome key functions of companies that are undertaking business transformation. The differences between countries can be significant.

The Global Talent Competitiveness Index (GTCI) measures how countries' policies and practices enable them to attract, develop and retain human capital that contributes to productivity. The GTCI combines an assessment of what and how countries produce and acquire talent, and the resultant skills available to them. The top European performers in the GTCI's 2014 report are Switzerland, the UK, Germany and the Netherlands. The ways in which these positions have been attained vary. Germany and Switzerland focus heavily on mixing academic and vocational training, producing a steady stream of talent with practical skills. By contrast, nations such as the UK and the Netherlands steer students into predominantly academic training that corresponds with the needs of businesses.

Insead Global Talent Competitiveness Index 2016

Country	Score	Ranking
Austria	63.55	15
Belgium	61.89	18
Denmark	67.86	5
Finland	65.33	10
France	59.16	22
Germany	63.85	14
Ireland	63.14	16
Italy	50.21	41
Luxembourg	68.98	3
Netherlands	65.12	12
Norway	66.34	8
Portugal	52.87	33
Spain	52.51	36
Sweden	66.62	6
Switzerland	72.65	1
UK	66.59	7
Israel	56.68	25
US	67.90	4
Singapore	71.45	2

Note: Score from 1 to 100; Ranking from 1 to 93.
Source: Insead Global Talent Competitiveness Index 2016
http://global-indices.insead.edu/gtci/

Attractiveness to highly skilled foreign workers

A diverse and internationally oriented workforce has become a basic requirement in the modern business world. An attractive working and living environment is therefore vital if a country is to appeal as a hub for multinational companies (MNCs). This attractiveness to qualified workers is influenced by a range of factors including the existence of clusters, quality of life and compensation packages. Generally speaking, when seeking a location to pursue their successful career, competitive compensation packages are key to commercial and legal, tax and finance functions whereas the presence of leading universities and research centers appeal more for research and development positions. Newcomers across the board can be attracted by compensation levels, the availability of international schools and the existence of an expatriate community.

Ease of attracting foreign skilled workforce

Country	Index	Ranking	Percentage of international workforce
Austria	5.85	21	14.20%
Belgium	5.57	24	10.38%
Denmark	5.12	31	5.53%
Finland	4.03	48	2.70%
France	4.60	39	5.84%
Germany	6.26	19	9.27%
Ireland	7.22	12	15.35%
Italy	3.37	51	6.60%
Luxembourg	8.49	2	64.34%
Netherlands	6.85	14	10% (estimate)
Norway	6.65	16	11.72%
Portugal	4.36	43	4.90%
Spain	4.66	33	13.19%
Sweden	5.47	26	4.30%
Switzerland	8.91	1	22.97%
UK	8.00	6	8.64%
Israel	5.45	27	3.99%
US	8.31	3	16.10%
Singapore	8.12	5	38.38%

Note: IMD WCY Executive Opinion Survey based on an index from 0 to 10; Ranking from 1 to 60, based on OECD (2015) Migration Statistics **Source:** IMD World Competitiveness Yearbook 2015 (Foreign high-skilled people)

Switzerland and the UK are the two most attractive countries for foreign highly skilled workers out of the seven core countries covered in this report. Both countries offer outstanding career possibilities coupled with flexible labor laws and a high number of foreign and domestic global MNCs.

Mercer Quality of Living Index and Environmental Performance Ranking

Country	Quality of living ranking (Note 1)	Environmental Performance Ranking (Note 2)
Austria (Vienna)	1	18
Belgium (Brussels)	22	41
Denmark (Copenhagen)	9	4
Finland (Helsinki)	31	1
France (Paris)	27	10
Germany (Munich)	4	30
Germany (Berlin)	14	-
Ireland (Dublin)	34	19
Italy (Rome)	52	29
Luxembourg (Luxembourg)	19	20
Netherlands (Amsterdam)	11	36
Norway (Oslo)	31	17
Portugal (Lisbon)	41	7
Spain (Madrid)	51	6
Sweden (Stockholm)	19	3
Switzerland (Zürich)	2	-
Switzerland (Geneva)	8	16
UK (London)	40	12
Israel (Tel Aviv)	105	49
US (San Francisco)	27	26

Note 1: Range from 1 to 205, Source: Mercer Quality of Living Index 2015, www.imercer.com **Note 2:** Score from 1 to 100; Ranking from 1 to 178, Source: EPIYale University 2016, http://epi.yale.edu//epi/country-rankings

Despite being a "soft factor", standard of living is important in selecting a site. This is especially the case when filling senior positions where executives are joined by their families. One should, however, take into account individual corporate cultures when assessing this rating. Staff in communications, software or fashion industries can have very different preferences than those working in LS or finance. For instance, a fast-growing start- up might choose a location with a lower standard of living rating but a more exciting lifestyle that appeals to younger employees as well as better suiting its brand strategy. A mature company might select a location that appeals more to senior executives with children.

In 2015, Mercer evaluated cities around the world according to their standard of living and how companies compensate senior executives to move there. Switzerland, the Netherlands and Germany all scored highly.

Another measurement for standard of living is the **Yale Environmental Performance Index,** which ranks how well countries perform on high-priority environmental issues in two broad policy areas: protection of human health from environmental harm and protection of ecosystems. Most European countries score well, with Switzerland, Germany and the Netherlands taking the lead.

Labor market flexibility
Fundamental to staffing level flexibility is the freedom of entering into and/or terminating a labor agreement. There are traditionally huge differences in how Anglo-Saxon countries handle aspects such as the notice period for termination, collective labor agreements and sick leave regulations compared to continental European countries. According to the "Index of Economic Freedom" the UK, Ireland and – as an exception in continental Europe – Switzerland have reasonably flexible **labor markets including immigration regulations**. The rankings are similar when addressing only **labor regulations (hiring/ firing practices, minimum wages, etc.**) again with Anglo-Saxon countries and Switzerland at the top of the European list.

Flexibility of Labor Market and Labor Regulations

Country	Labor Freedom Ranking (Note 1)	Flexibility of Labor Regulations Ranking (Note 2)
Austria	72.5	47
Belgium	60.5	51
Denmark	86.0	2
Finland	53.7	49
France	43.5	57
Germany	50.6	41
Ireland	72.1	18
Italy	53.0	52
Luxembourg	42.6	22
Netherlands	64.0	45
Norway	48.5	19
Portugal	43.5	31
Spain	51.7	43
Sweden	53.5	42
Switzerland	72.1	1
UK	71.8	15
US	64.6	14
Israel	91.4	11
Singapore	90.7	8

Note 1: Index of Economic Freedom by The Heritage Foundation 2016 (scores from 1 to 100), http://www.heritage.org/index/explore. **Note 2**: IMD World Competitiveness Yearbook 2015 (Labor regulations)

Productivity factors

Workforce productivity, hours worked per year and vacations
Workforce productivity and working hours per year are important decision factor in the site selection process. Measuring workforce productivity as output per worked hour may be only an approximation, but it gives a general indicator of how efficiently work is organized and capital is invested. Germany and Switzerland have for many years led the field in workforce productivity, which in the case of Switzerland helps explain and mitigate relatively high salaries. France, the UK, Ireland and Belgium experience comparatively lower productivity and consequently also lower salaries.

Annual vacation – working hours – workforce productivity

Country	Annual vacation (score) [1]	Average number of working hours per year	Workforce productivity (score) [2]	Ranking
Austria (Vienna)	27	1,786	7.16	8
Belgium (Brussels)	18	1,730	7.45	5
Denmark (Copenhagen)	25	1,674	6.5	22
Finland (Helsinki)	29	1,713	5.37	38
France (Paris)	29	1,600	6.12	25
Germany (Frankfurt)	28	1,743	8.16	1
Ireland (Dublin)	31	1,707	7.95	3
Italy (Rome)	32	1,826	5.08	42
Luxembourg (Luxembourg)	32	1,788	6.7	13
Netherlands (Amsterdam)	27	1,755	7.32	7
Norway (Oslo)	25	1,749	7.08	9
Portugal (Lisbon)	23	1,696	6	26
Spain (Madrid)	26	1,747	5.59	32
Sweden (Stockholm)	25	1,795	6.87	10
Switzerland (Zürich)	24	1,890	8.12	2
UK (London)	25	1,787	5.53	34
Israel (Tel Aviv)	17	1,966	5.96	28

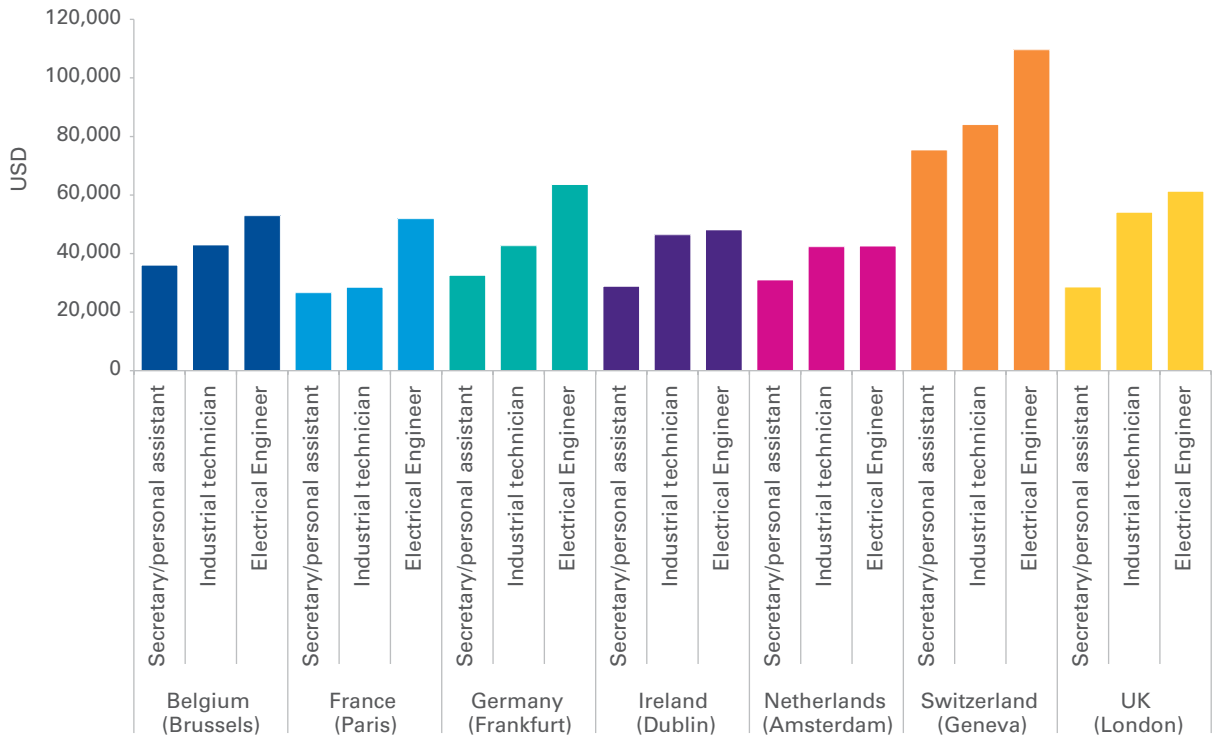
(1) Notes: Paid working days (excluding legal holidays) Source: UBS Prices & Earning 2015. **(2) Notes:** Figures are normalised scores (from 1 to 10), [2] Range from 1 to 60. **Source:** IMD World Competitiveness Yearbook 2015 (Workforce productivity).

Wages and wage increases

Salary costs are clearly a key factor in a site selection process. Huge differences in gross income exist between the countries in this report for various workforce levels. Switzerland stands out clearly from all other countries due to very high labor productivity, long working weeks and an exceptionally well-paid commercial and industrial ecosystem. Steep currency fluctuations between the Euro, British pound sterling and Swiss Franc further accentuate the spread between countries.

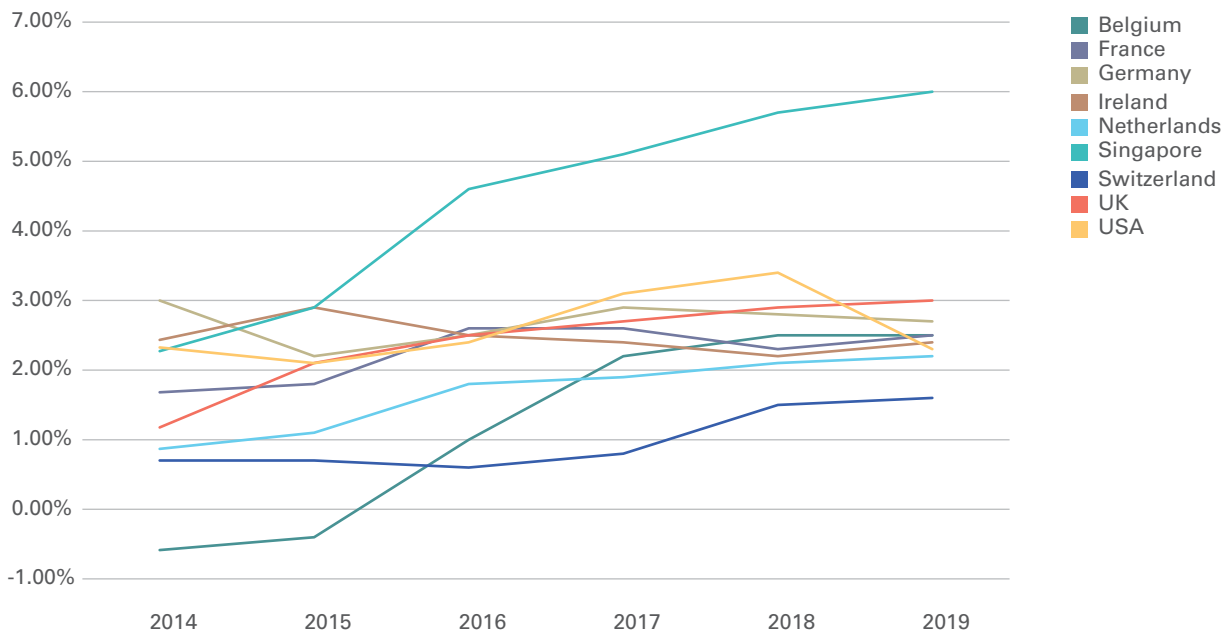
Average annual Salaries

Source: UBS Prices & Earning 2015



As investment decisions are usually mid to long-term, rather than looking at nominal salaries it might be advisable to analyze salary developments. The estimated growth in average hourly wages over the prior year could be a useful indicator. Countries with initially competitive salaries might become more expensive over time, sometimes suddenly.

Wage cost development (estimated annual percentage growth)



Source: Economist Intelligence Unit EIU

Price levels

Price levels for consumer baskets and for office space impact profitability directly or indirectly via salaries. In theory, prices should be defined on a free market basis, with shortage of supply driving prices up. In practice they appear to correlate more with general salary levels, with high salaries driving up prices for residential rents and the cost of consumer goods.

Prices Index

Country	Excluding rent	Including rent
Austria (Vienna)	65.4	53.4
Belgium (Brussels)	67.2	57.3
Denmark (Copenhagen)	88.0	74.3
Finland (Helsinki)	74.3	63.2
France (Paris)	72.6	63.8
Germany (Frankfurt)	65.8	55.1
Ireland (Dublin)	70.3	63.1
Italy (Rome)	67.1	57.1
Luxembourg (Luxembourg)	72.3	66.1
Netherlands (Amsterdam)	65.3	55.5
Norway (Oslo)	92.9	79.9
Portugal (Lisbon)	55.5	45.3
Spain (Madrid)	60.6	50.4
Sweden (Stockholm)	76.9	62.8
Switzerland (Geneva)	106.1	91.8
UK (London)	84.7	79.5
Israel (Tel Aviv)	72.0	61.4
US (New York)	100.0	100.0

Notes: These calculations are based on the cost of a basket of 122 goods and services weighted according to European consumption habits (New York = 100), Range from 0 (1) to 120 **Source:** UBS Prices & Earning 2015, http://www.ubs.com/global/en/wealth_management/wealth_management_research/prices_earnings.html

Price indices provide a snapshot of the cost of living for a given location, which helps when deciding if and how many people can be moved to a new location. The comparison of price levels for a basket of goods and services shows Geneva and London to be expensive cities, while Amsterdam, Frankfurt and Brussels can be found at the lower cost end.

For site selection purposes, observing purchasing power rather then price indices is recommended. Purchasing power indicates what employees can buy with their net wages (after social security contributions and taxes). Zurich and Frankfurt have high purchasing powers, while employees in London and Amsterdam can buy considerably less with their salaries. This makes the latter three cities comparatively expensive places to live.

Domestic purchasing power

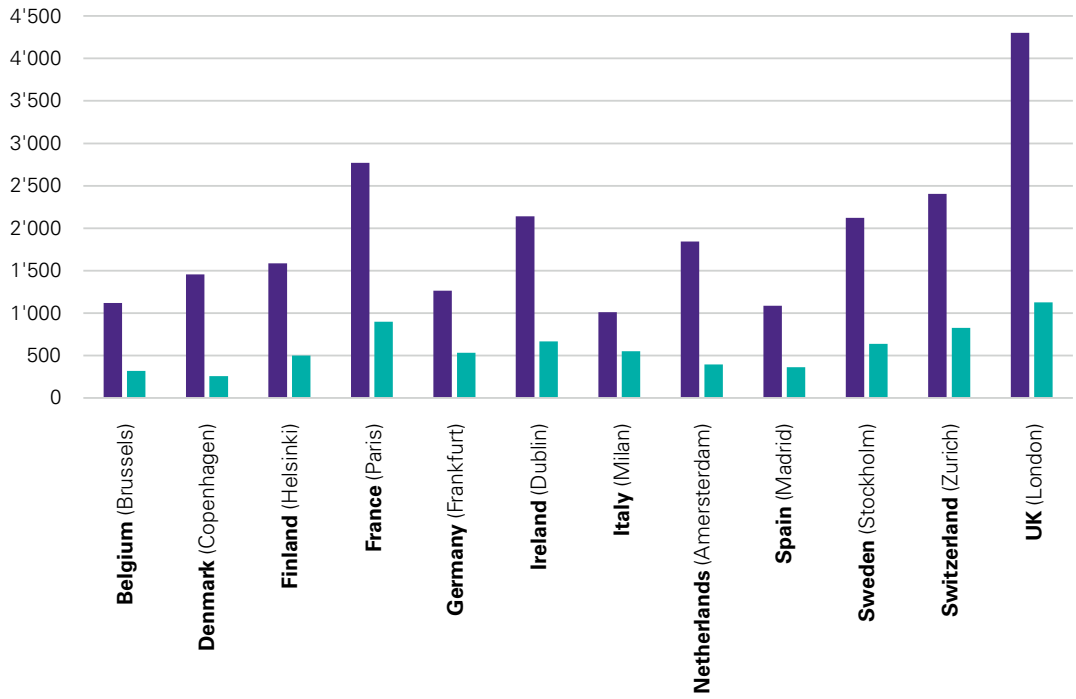
Country	Hourly pay net
Belgium (Brussels)	90.9
France (Paris)	92.4
Germany (Frankfurt)	102
Ireland (Dublin)	92.6
Netherlands (Amsterdam)	85.1
Switzerland (Zürich)	130.5
UK (London)	85.3
US (New York)	100.0

Notes: Net hourly wages divided by the cost of the entire basket of goods excluding rent (New York = 100), Range from 0 (1) to 135 Source: UBS Prices & Earning 2015, http://www.ubs.com/global/en/wealth_management/wealth_management_research/prices_earnings.html

Housing costs and office rent

Housing costs are usually calculated on the basis of a city center apartment while office rents are based in Central Business District offices. Both housing and offices are considerably less expensive outside of city centers. The highest apartment rents between the six peer cities are found in London and Paris. A 75 sqm flat in the city center of London costs an average of USD 4,300 per month. This compares to USD 2,700 per month in Paris and around USD 2,400 per month in Zurich. The highest CBD prime rents can be seen in London and in Amsterdam.

Estimated rents for housing and offices



Average monthly cost for a 75 sqm apartment in USD/month

Prime rents CBD in USD/sqm/year

Source: CBRE, www.globalpropertyguide.com, KPMG Real Estate 2016

International treaty network

Critical factors that influence productivity and efficiency are how a location is embedded into international trade via free trade agreements, investment protection treaties and double tax treaties, social security treaties and agreements on the free movement of people. A strong network of such treaties helps to ease and accelerate international growth. The EU is currently in discussion with the US regarding a Transatlantic Trade and Investment Partnership (TTIP), a proposed free trade agreement.

While all countries covered in this report have a strong network of such agreements, there are differences in form and scope. The UK for instance is not part of the Schengen Area that allows travel on a single visa throughout the area. Not that being a member of the EU is the only way to enjoy free movement of people. Switzerland is outside the EU yet benefits from the EU single market via a free trade agreement, as well as a free trade agreement with the People's Republic of China.

Country	Schengen Area[6]	Access to EU single market[7]	Free trade agreement with the US	Free trade agreement with China	Parent Subsidiary Directive[8]	EU member state	Eurozone member state
Belgium	Yes	Yes	In discussion	No	Yes	Yes	Yes
Denmark	Yes	Yes	In discussion	No	Yes	Yes	No
Finland	Yes	Yes	In discussion	No	Yes	Yes	Yes
France	Yes	Yes	In discussion	No	Yes	Yes	Yes
Germany	Yes	Yes	In discussion	No	Yes	Yes	Yes
Ireland	No	Yes	In discussion	No	Yes	Yes	Yes
Italy	Yes	Yes	In discussion	No	Yes	Yes	Yes
Netherlands	Yes	Yes	In discussion	No	Yes	Yes	Yes
Spain	Yes	Yes	In discussion	No	Yes	Yes	Yes
Sweden	Yes	Yes	In discussion	No	Yes	Yes	No
Switzerland	Yes	Yes[9]	No	Yes	Yes	No	No
UK	No	Yes	In discussion	No	Yes	Yes	No

[6] Named after the Schengen Agreement, the **Schengen Area** comprises 26 European countries that have abolished passport and any other types of border control on their common borders, also referred to as internal borders, and strengthened external border controls with non-Schengen states. The Schengen Area mostly functions as a single country for international travel purposes, with a common visa policy.

[7] The Single Market refers to the EU as one territory without any internal borders or other regulatory obstacles to the free movement of goods and services.

[8] On 22 December 2003, the European Council adopted Directive 2003 / 123 / EC to broaden the scope and improve the operation of the Council Directive 90 / 435 / EEC on the common system of taxation applicable in the case of parent companies and subsidiaries of Member States. The 1990 Directive was designed to eliminate tax obstacles in the area of profit distributions between groups of companies in the EU by:

- Abolishing withholding taxes on payments of dividends between associated companies of different Member States and
- Preventing double taxation of parent companies on the profits of their subsidiaries.

[9] Via EU / EFTA Free Trade Agreement (with exception of financial services)

Quality of infrastructure / flight connections
In high productivity sectors such as LS, disruptions in manufacturing or logistics can have a significant impact. As a result, infrastructure quality is of great importance. Continental European countries such as France, Netherlands, Germany and Switzerland fare better than the UK or Ireland in this respect.

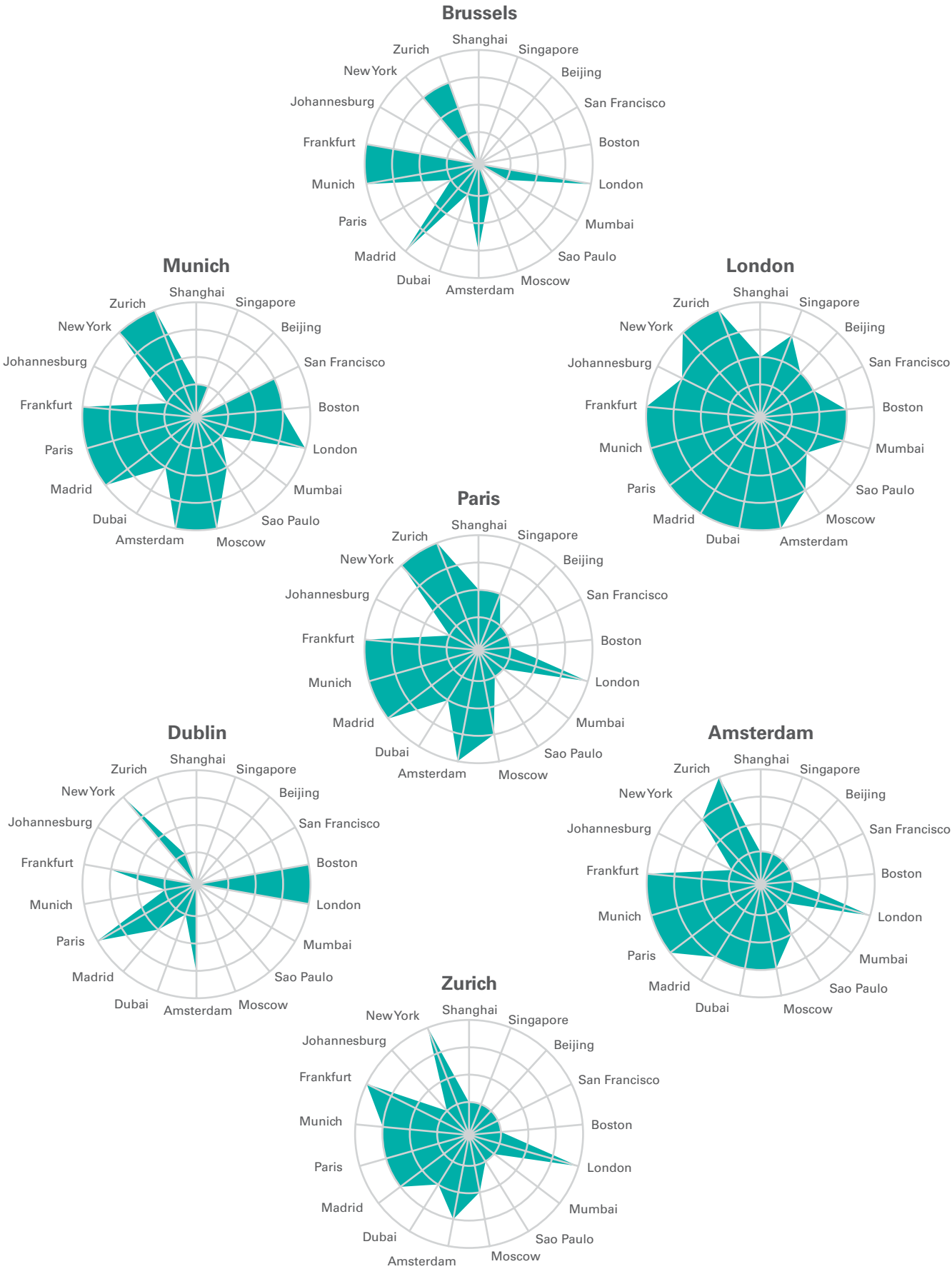
Infrastructure quality

Country	Quality of overall infrastructure	Quality of roads	Quality of railroad infrastructure	Quality of air transport
Austria	8	6	12	32
Belgium	22	30	17	17
Denmark	12	16	9	23
Finland	6	12	5	9
France	10	7	6	15
Germany	11	13	9	11
Ireland	32	24	30	20
Italy	66	49	32	63
Luxembourg	17	20	14	30
Netherlands	5	2	7	4
Norway	27	65	41	10
Portugal	15	4	25	24
Spain	14	11	4	12
Sweden	19	23	26	22
Switzerland	1	9	2	8
UK	24	29	18	19
Israel	60	46	55	39
Singapore	4	3	8	1

Note: Ranking from 1 to 144 **Source:** World Economic Forum: The Global Competitiveness Report 2015-2016. http://www3.weforum.org/docs/gcr/2015-2016/Global_Competitiveness_Report_2015-2016.pdf. BS Prices & Earning 2015, http://www.ubs.com/global/en/wealth_management/wealth_management_research/prices_earnings.html

Direct flight connections to key LS locations are an especially relevant decision factor. In this regard, London is Europe's best-connected city for air travel, followed by Paris, Munich, Amsterdam and Zurich. It must be noted that all continental European cities as well as London are connected to a high speed rail system, which is a valuable alternative to air travel.

Direct flight connections (number per day)



Sustainability factors

The sustainability of a business environment is closely connected to key macroeconomic factors that indicate whether or not a country can provide sufficient stability over time to attract and retain foreign direct investment.

Key macroeconomic factors include GDP per person, government debt as a percentage of GDP, current account balance as a percentage of GDP, government expenditure as a percentage of GDP, and GDP growth.

Key macroeconomic factors

Country	GDP (USDbn)	GDP per person (PPP) in USD 2015	Current account balance in % of GDP 2015	Government debt as % of GDP	Government expenditure as % of GDP	GDP growth forecast 2016
Austria	404	47'170	2.3%	86.8%	52.3%	1.26%
Belgium	491	43'450	0.3%	105.6%	54.3%	1.46%
Denmark	262	46'290	6.3%	42.5%	57.0%	1.60%
Finland	226	41'040	0.2%	59.6%	58.7%	1.40%
France	2'664	41'370	-0.4%	95.1%	57.2%	1.34%
Germany	3'816	46'780	8%	73.1%	44.0%	1.50%
Ireland	243	51'800	3.8%	109.5%	39.0%	3.50%
Italy	2'197	36'740	2%	132.1%	51.1%	1.10%
Luxembourg	60	110'664	5.3%	24.4%	44.0%	2.30%
Netherlands	838	49'586	9.1%	68.0%	46.8%	1.70%
Norway	344	67'310	8.5%	30.1%	45.6%	1.50%
Portugal	304	28'960	1%	129.2%	49.0%	1.60%
Spain	1'613	34'960	1.3%	97.7%	43.6%	2.73%
Sweden	460	47'170	5.9%	41.5%	53.0%	3.08%
Switzerland	495	60'710	12%	46.4%	33.5%	1.12%
UK	2'662	41'300	-4.7%	89.4%	44.4%	2.00%
Israel	284	33'860	4.5%	68.8%	22.8%	3.70%
US	17'943	55'838	-1.9%	104.8%	35.0%	2.00%
Singapore	470	84'820	23.3%	99.3%	14.0%	2.80%

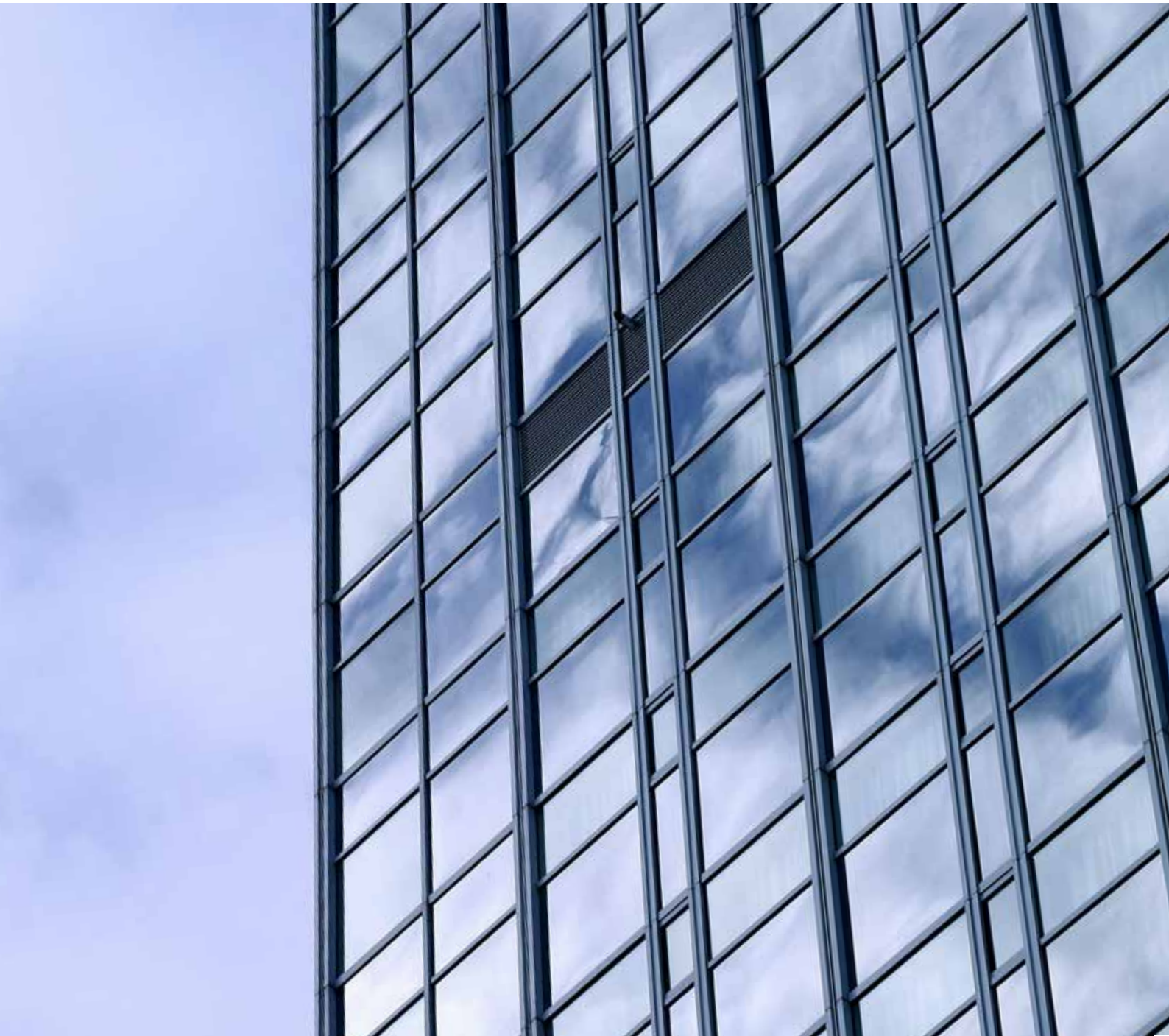
Sources: The Economist Intelligence Unit 2016, The Economist Magazine, March 2016, IMD Yearbook 2015

Changes in GDP should be observed as economic growth is typically a stabilizing factor, though caution must be exercised. Besides currency fluctuations, which can have a quick and significant impact on nominal GDP, there is the possibility that GDP does not correctly reflect an economy's true strength. As GDP is the sum of private sector investments, government spending and household consumption (plus exports; minus imports), the real strength and stability of an economy depends on which is contributing to the growth in GDP. For instance, it is widely recognized that lower rates of government expenditure as a percentage of GDP are a sign of a more free market-oriented economy.

Government debt as a percentage of GDP should be observed closely when assessing economic stability. Deficit spending cannot go on indefinitely without impacting a country's credit rating and consequently its refinancing cost. However, as with many macroeconomic indicators, movements should be analyzed rather than only absolute values. In the long run, highly indebted countries must generate higher growth rates, reduce their spending or raise their tax rates.

The **current account** describes whether a country is a net exporter or a net importer. Countries such as Switzerland and Germany are net exporters, which is seen as a sign of economic health and stability. However, countries that depend heavily on exports are more vulnerable than importing countries to changes in global demand. In the case of Switzerland, the impact of a current account surplus and high productivity had a strong impact on its currency, which appreciated in February 2015 by almost 20% against the Euro and the USD following the Swiss National Bank's decision to lift the EUR/CHF peg. Net importing countries must fill the payment gap either through capital inflow or by reducing imports over time.

Without significant growth a system with an imbalance between one or more of the abovementioned factors might be forced to significantly change its fiscal and monetary policies where possible, which almost always results in a significant impact on long-term private sector investment plans.



KPMG

Labor force participation

The **Labor Force Participation Rate** is the proportion of the population that is aged 15 and older and is economically active. It is a significant indicator of how capable an economy is of absorbing economic shocks. Countries with a lower participation rate tend to be more vulnerable to cyclical and structural crises.

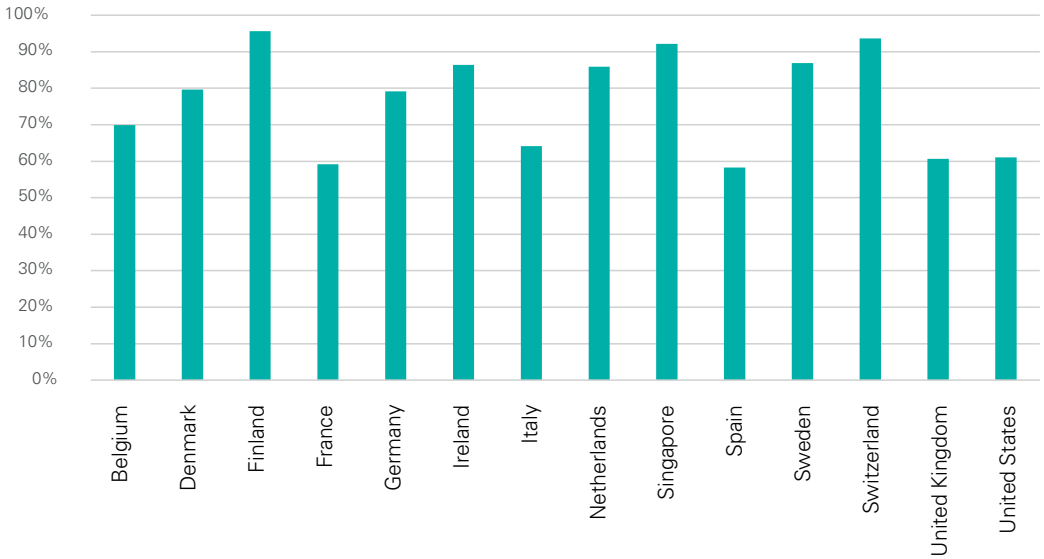
Labor Force Participation Rate

Country	Total Population	Labor Force Particpation Rate
Austria	8.6 m	61.0%
Belgium	11.3 m	53.0%
Denmark	5.7 m	63.0%
Finland	5.5 m	60.0%
France	66.4 m	56.0%
Germany	81.2 m	60.0%
Ireland	4.6 m	61.0%
Italy	60.8 m	49.0%
Luxembourg	0.6 m	58.0%
Netherlands	16.9 m	64.0%
Norway	5.2 m	65.0%
Portugal	10.4 m	60.0%
Spain	46.4 m	59.0%
Sweden	9.7 m	64.0%
Switzerland	8.2 m	68.0%
UK	64.8 m	62.0%
Israel	8.2 m	63.0%
US	318.9 m	63.0%
Singapore	5.5 m	68.0%

Sources: Eurostat, Worldbank 2014

Political stability
Measured as the ability of governments to build and maintain a business and legal environment which offers clear and attractive conditions for business, political stability is a key feature of locations that are attractive for foreign direct investment. The **World Bank's Worldwide Governance Indicators (WGI)** project reports aggregate individual governance indicators for various dimensions of governance relevant to doing business. Unsurprisingly, all European countries rank very favorably compared to the rest of the world. Despite this, there is a significant spread in certain sub-sectors such as **political stability and absence of violence/terrorism.**

Political stability and absence of violence/terrorism



Source: www.worldbank.org (Scores 0 to 100), 2015

Data protection and cybersecurity
With Big Data becoming a decisive factor in LS and healthcare, ranging from client/ patient data to R&D, it is important to choose a location that offers a sustainable and appropriate environment for running data storage and analysis operations10 – in particular the level of data protection afforded. The newly launched **Global Cybersecurity Index (GCI)** measures countries' commitments to cybersecurity. Cybersecurity has a wide field of applications that cuts across many industries and sectors. Each country's level of development is analyzed by reference to five categories: legal measures, technical measures, organizational measures, capacity building and cooperation.

Global Cybersecurity Index (GCI)

Country	Index [1]	Ranking [2]
Austria	0.676	6
Belgium	0.441	14
Denmark	0.588	9
Finland	0.618	8
France	0.588	9
Germany	0.706	5
Ireland	0.206	22
Italy	0.559	10
Luxembourg	0.471	13
Netherlands	0.676	6
Norway	0.725	4
Portugal	0.294	19
Spain	0.588	9
Sweden	0.647	7
Switzerland	0.353	17
UK	0.706	5
Israel	0.676	6
US	0.824	1
Singapore	0.676	6

Note: [1] Index from 0-1 [1] Ranking from 1-29, [1] **Source:** Global Cypersecurity Index & Cyberwellness Profiles Report http:// www.itu.int/dms_pub/itu-d/opb/str/D-STR-SECU-2015-PDF-E.pdf

[10] For Details see: KPMG Health Care and Life Sciences Institute, Cyber Healthcare Survey, 2015, www.kpmg-institutes.com

Global rankings of business locations

The three most widely regarded rankings are the **Index of Economic Freedom** from the Heritage Foundation, the **World Competitiveness Yearbook** from the IMD and the **Global Competitiveness Report** from the World Economic Forum. As countries' rankings can vary significantly over time and between reports, it is advisable to analyze trends by country rather than observing only snapshots for a given year or ranking.

The **Index of Economic Freedom** measures economic freedom of countries based on freedom of trade, business freedom, investment freedom and property rights.

The IMD World Competitiveness Yearbook measures how well countries manage their resources and competencies to facilitate long-term value creation. The overall ranking reflects more than 300 criteria, approximately two-thirds of which are based on statistical indicators and one-third on an exclusive IMD survey of 6,234 international executives.

The Global Competitiveness Report ranks countries according to twelve different pillars including innovation, macro-economic environment and labor market efficiency.

Global Rankings of Business Locations

Country	Index of Economic Freedom [1]	Global Competitiveness [2]	World Competitiveness [3]
Austria	28	21	26
Belgium	44	18	23
Denmark	12	13	8
Finland	24	4	20
France	75	23	32
Germany	17	5	10
Ireland	8	25	16
Italy	86	49	38
Luxembourg	19	19	6
Netherlands	16	8	15
Norway	32	11	7
Portugal	64	36	36
Spain	43	35	37
Sweden	26	10	9
Switzerland	4	1	4
UK	10	9	19
Israel	35	27	21
US	11	3	1
Singapore	2	2	3

[1] **Source:** 2016 Index of Economic Freedom by The Heritage Foundation, http://www.heritage.org/index/explore, [2] **Source:** World Economic Forum: The Global Competitiveness Report 2015-2016, http://www3.weforum.org/docs/gcr/2015-2016/Global_Competitiveness_Report_2015-2016.pdf, [3] **Source:** 2015 IMD, The World Competitiveness Yearbook 2015, https://worldcompetitiveness.imd.org/countryprofile

KPMG

Taxation and incentives

Key tax and incentive considerations

Tax implications have always been a significant consideration for LS companies. Recent and ongoing changes to international regulations make it more important than ever to ensure a proper alignment between tax planning and the underlying supply chain.

In selecting the most appropriate location for various activities, aspects such as ordinary tax rates for different types of income, tax rulings, incentives, double-tax treaty networks and transfer pricing regulations become crucial. In addition, consider the level and type of incentives granted by governments for performing certain activities within their borders.

In order to counter the extensive use of special tax regimes offered by various jurisdictions, the OECD has developed an action plan on Base Erosion and Profit Shifting (BEPS). The plan is designed to address the arbitrage between different tax rates and different interpretations of tax principles that arise as a result of tax sovereignty. Efficient and forward-looking tax planning must take BEPS into consideration.[11]

Comparison of corporate tax rates for various types of income stream

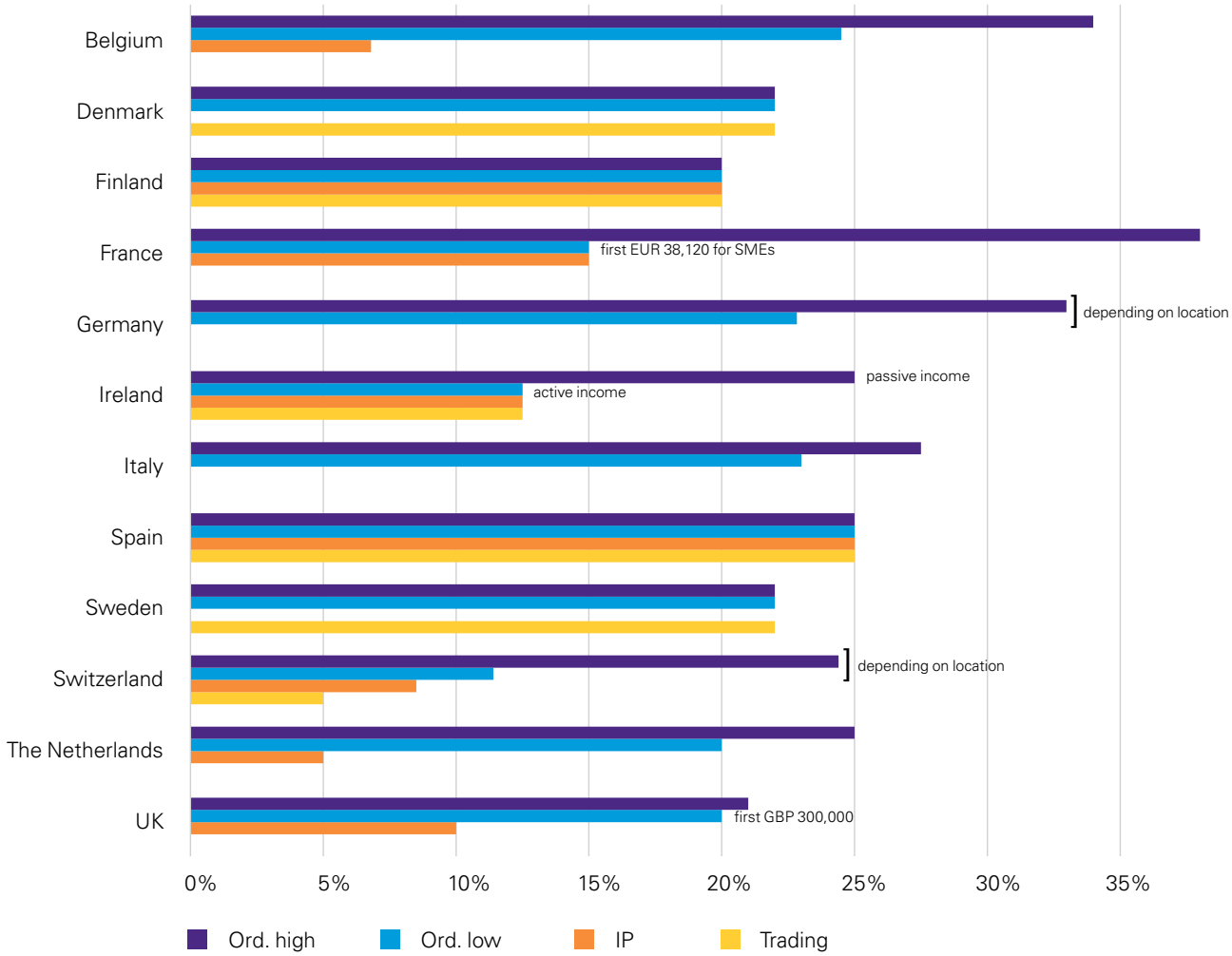
A first step towards analyzing a location is to compare the ordinary corporate tax rates of each country applicable to general business activities.

Reasonable taxation of IP income from patents, technology or trademarks is also an important consideration for LS companies that own mature income-producing IP.

Trading income is also taxed at a lower level in some countries such as Ireland and Switzerland, whereas in other countries trading income is generally subject to ordinary taxation.

[11] The post Base Erosion and Profit Shifting world, KPMG International, 2014

Overview of taxation rates for ordinary income, income from IP and trading income



Overview of IP / Innovation / Patent boxes per jurisdiction

Country	Ord. high	Ord. low	IP	Trading
Belgium	33.99%	24.50%	6.80%	n/a
Denmark	22.00%	22.00%	n/a	22.00%
Finland	20.00%	20.00%	20.00%	20.00%
France	38.00%	15.00%	15.00%	n/a
Germany	32.98%	22.83%	n/a	n/a
Ireland	25.00%	12.50%	12.50%	12.50%
Italy	27.50%	23.00%	n/a	n/a
Spain	25.00%	25.00%	25.00%	25.00%
Sweden	22.00%	22.00%	n/a	22.00%
Switzerland	24.40%	11.40%	8.50%	5.00%
The Netherlands	25.00%	20.00%	5.00%	n/a
UK	21.00%	20.00%	10.00%	n/a

KPMG

Taxation rates for ordinary income, income from IP and trading income

Country	Ordinary tax rates	Tax rates applicable to trading income
Belgium	The tax rate is 33%, though a surcharge of 3% is levied in addition, resulting in a combined rate of 33.99%. Lower rates are applicable for profits of up to EUR322,500, starting with 24.96% for the first EUR25,000. Because of the notional interest deduction (applicable to all corporate taxpayer), the average effective corporate can be much lower (26,7% in 2014)	n/a
Denmark	The main corporate income tax rate is 22%.	n/a
Finland	Corporate tax rate is 20%; same rate is applied to capital gains.	20%
France	The maximal corporate tax rate is 38% including the standard CIT rate of 33.33% and additional contributions (3.3% social contribution and10.7% temporary exceptional contribution – which should be applicable until financial years closed on December 31, 2016). Small and medium sized companies are subject to a corporate income tax rate of 15% for taxable profits of up to EUR38,120.	n/a
Germany	Corporate income tax amounts to 15% (plus 5.5% solidarity surcharge thereon) and trade tax amounts to around 7% to 17.15% (average approximately14%, depending on municipality), resulting in a total tax rate of 22.8% to 33.0% (average approximately 30%).	n/a
Ireland	The corporate income tax rate for non-trading income is 25% whereas trading income may be made subject to a 12.5% rate. Capital gains are subject to a 33% rate.	The corporate income tax rate on trading income is 12.5%.
Italy	Italian corporate entities are subject to a corporate income tax known as IRES, and to a regional production tax known as IRAP. The standard rates are as follows: – 27.5% for IRES – 3.9% for IRAP The IRES rate will be reduced from 27.5% to 24% from 2017. For 2016 it remains unchanged.	n/a
Netherlands	The headline rate of corporate income tax is 25% levied on taxable profits (including capital gains) in excess of EUR200,000. The rate applicable to the first EUR200,000 of taxable profits is 20%.	n/a
Spain	Tax rate was reduced to 25% in 2016 (28% in 2015) for SMEs.	n/a
Sweden	The corporate income tax rate is currently 22%	The corporate income tax rate on trading income is 22%
Switzerland	Income taxes are applied at federal, cantonal and communal level in Switzerland. The pre-tax corporate income tax rates range between 11.4% and 24.4% (depending on municipality).	Trading income may be subject to tax rates of 5% (principal companies) or 8.5% to 12% (mixed companies).
UK	The main corporate income tax rate since April 1, 2015 is 21%. Profits up to GBP200,000 are taxed at a rate of 20%. Marginal relief applies to profits between GBP300,000 and GBP1.5 million	n/a

IP development and management

Key strategy for LS companies to grow both their pipelines and their bottom lines is to align commercial, finance and R&D operations to more rigorously challenge research objectives, focus on return on investment (ROI) and strengthen collaboration and alliances – particularly with universities. Such strategies are outlined in KPMG's report on Pharmaceutical Innovation[12].

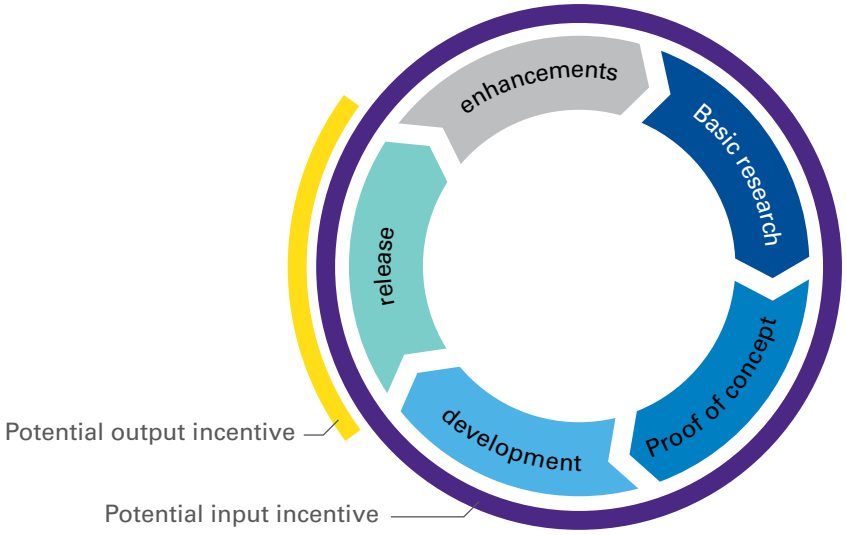
Companies looking to locate R&D centers should therefore first analyze the presence of top universities and researchers in their specialist field. Attention should also be paid to a country's willingness to support innovation, and finally the existence of any incentives for conducting R&D activities.

Intangible assets are crucial to LS. Forward-looking planning of the development and exploitation of IP in the form of patents, technology or trademarks is essential. LS companies must ensure that profits are returned to those parties that actually control the development, enhancement, protection and exploitation of the IP and not simply given to the party that has legal ownership and funds the IP. The main questions are where the IP has been developed or will be developed, where it should be exploited and at what stage and price it should be moved from the place of development to the place of exploitation. A diligent analysis of possible locations should focus on IP management, tax rates, collaboration with tax authorities and availability of rulings, transfer pricing regulation, double tax treaty network, and availability of incentives, among other factors.

Development of IP

A recent KPMG study of large MNEs with R&D activities reveals that companies with complex R&D operations focus on the **potential for alliances with universities and access to qualified researchers** as well as a stable political environment. 72% of respondents to the study indicated that **incentives and favorable tax schemes** are of great importance when deciding where to establish an R&D facility[13].

Innovation life cycle and incentives



Input incentive: primarily linked to the cost structure of an organization
Output incentive: focus on the commercial benefits from the exploitation of R&D

[12] Growing the Pipeline, Growing the Bottom Line: Shifts in Pharmaceutical R&D Innovation, KPMG International, 2014
[13] Steuerlich Förderung von F+E, KPMG Switzerland, 2015

"Input" incentives for the development of IP

An important part of the site selection process if the systematic analysis and exploitation of the available incentives at international, national and regional level for companies conducting R&D and developing IP. Most in-scope countries offer some form of incentives for R&D or other activities. The main consideration regarding IP in early stages of development should be if a location offers the possibility to tax efficiently offset R&D expenses and whether other R&D incentives are available. Incentives can be divided between tax incentives and other incentives. It should be noted that the incentives environment is moving quickly with regard to the definition of R&D and IP. At a national and regional level there are many further investments which cannot all be listed.

Overview of input incentives by country

Country	R&D tax incentives	Other incentives
Belgium	For R&D investments, an additional deduction from the taxable basis is available either as a one-off deduction calculated as 13.5% of the investment value or spread in time at 20.5% of the annual depreciation on the assets. This comes on top of the regular depreciation expense. An alternative R&D tax credit is calculated as the investment deduction multiplied by the nominal corporate income tax rate. This R&D tax credit is cash refundable if not utilized after 5 years. Companies that employ scientific researchers benefit from a partial exemption from payment of withholding tax on their wages. They must transfer only 20% of the withholding tax due on the wage of these researchers to the tax authorities while they withhold the 100% that would normally be due. The measure therefore has no impact on the researchers' tax situations and generates a cash subsidy for the employer. Premiums and capital or interest subsidies on tangible and intangible assets granted by regional institutions within the framework of R&D support are fully exempt from corporate tax	Financial support is available in various forms
Denmark	Tax incentives for R&D are available, including instant tax deduction for R&D costs or depreciation over 5 years and unlimited loss carry-forward. In addition growth credit is available, whereby losses on certain R&D activities can be converted to payment (based on a tax value of 22%) from the tax authorities. Maximum payment per year is the tax value of DKK 25 million	Acquisition of patents and knowhow is fully tax deductible in year 1. Acquisition of other intangibles is depreciated over 7 years.
Finland	100% extra deduction on paid R&D salaries. Maximum extra deduction is limited to EUR 400,000 per year.	Tax depreciation on production capital expenditure is maximum 50% in 2013-2016 on machinery and maximum 14% on buildings.
France	R&D tax credit of 30% is available for the portion of R&D expenses below EUR 100 million, reduced to 5% for the portion exceeding that amount	Financial support is available in various forms. In addition, small and mid-sized innovative start-up companies ("JEI") may benefit under certain conditions from a one-year corporate tax exemption and a 50% rebate for the following year. A new temporary measure enacted on 6 August 2015 provides that companies can benefit under certain conditions from an exceptional deduction on assets depreciation (deduction from the taxable result of 40% of the assets fair value excluding financial expenses) for industrial assets purchased or manufactured between 15 April 2015 and 14 April 2016
Germany	Germany does not offer R&D tax incentives. State grants in cash for eligible R&D projects are applicable instead	Financial support is available in various forms, e.g. regional subsidies as well as subsidies at European, federal and state level

Country	R&D tax incentives	Other incentives
Ireland	Tax credit of 25% on capital and revenue expenditure on qualifying R&D expenditure. It is possible to claim excess R&D credits as a cash refund	Certain start-up companies are exempt from tax in each of their first three years
Italy	Until 2019 any company investing in R&D activities can be eligible for R&D tax credit of up to EUR 5 million per year. The relief is calculated on the basis of incremental expenditure*, up to a maximum of • 50% of costs for highly qualified personnel and outsourcing research contracts • 25% of depreciation costs and technical and industrial property expertise costs * of the average of R&D investments of the three tax periods preceding the current one at 31 December	Twenty-four new enterprise zones have been set up in areas of economic decline in the UK. Possible measures include a five-year holiday of up to GBP275,000
Netherlands	Companies deriving income from qualifying R&D activities are entitled to an additional 60% deduction of the costs and expenses relating to these activities. In addition, a wage tax reduction of 35% is granted to employers with respect to salaries, up to a ceiling of EUR250,000, paid to employees who carry out certain research and development (R&D) activities. For start-up companies developing technological products, this reduction is increased to 50%. For wage costs above this ceiling, the reduction is limited to 14	Financial support is available in various forms
Spain	There is the possibility to apply for a tax credit on expenses and certain investments made on R&D which distinguish between R&D projects and Technological Innovation projects. The general applicable fixed percentage rate for R&D tax credit is 25%, but if yearly expenses exceed the average expense of the preceding two years, 42% will be applicable to the excess. An additional 17% credit is available for personnel expenses relating to qualified researchers and 8% for investment in assets (excluding real estate) exclusively affected by R&D. In addition, a tax credit of 12% of the expenses incurred on technological innovation in the tax period can be deduced from the tax liability.	There is a reduced tax rate (15%) for new enterprises.
Sweden	Limited R&D incentives are available for certain companies. Maximum potential saving of SEK 230,000 per month, i.e. SEK 2,760,000 per year and group through reducing employer social security costs.	n/a
Switzerland	Accruals for future R&D projects carried out by third parties are permitted for up to 10% of taxable profit to a maximum of CHF 1 million	Full or partial tax holidays of up to ten years on cantonal and – in certain regions – federal tax level can be granted to substantial investment projects. In addition, funding may be available for collaboration between the company and a university
UK	Tax incentives for R&D expenditure are available, with an enhanced deduction of 130% for large companies and of 230% for small and mid-sized enterprises. R&D relief is also available in respect of qualifying expenditure by large companies on research into certain vaccines for human use. There is an "above-the-line" tax credit for large companies (also known as an "R&D expenditure credit"). Initially, the credit is available upon election (i.e. a taxpayer may elect to apply the credit in place of the deduction) but will became mandatory in April 2016. The credit is equivalent to 11% (10% before 1 April 2015) of qualifying expenditure	Twenty-four new enterprise zones have been set up in areas of economic decline. Possible measures include a five-year holiday of up to GBP275,000

Incentives in the European Union

Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. Horizon 2020 is the biggest EU research and innovation program to date with nearly EUR80 billion of funding available over the seven years 2014 to 2020. The EU Framework Program for Research and Innovation will be complemented by further measures to complete and further develop the European Research Area. These measures aim to break down barriers to create a genuine single market for knowledge, research and innovation. LS are considered to be Key Enabler Technologies and are eligible for funding. Further information can be found at www.ec.europa.eu

"Output" incentive for efficient IP management

Beneficial tax treatment of income generated from patents, technology or trademarks are called output incentives. To assess whether a location is favorable to host mature income-producing IP, consider the ordinary tax rate, the existence of a strong treaty network and the availability of so-called IP / Innovation or patent boxes which tax income from IP at a favorable rate. Also important is exit taxation when transferring IP from one jurisdiction to another.

Patent boxes as they exist in Europe are very heterogeneous in their design. There are five characteristics that impact the degree of tax advantage: (a) which IP rights qualify for the patent box (the scope); (b) the treatment of existing patents; (c) the treatment of acquired patents; (d) the treatment of embedded royalties; and (e) the existence of development conditions.

Overview of IP / Innovation / Patent boxes per jurisdiction

Country	Overview IP / Innovation / Patent boxes per jurisdiction
Belgium	Patent Income Deduction reduces the applicable tax rate to maximum 6.8% on qualifying income
Denmark	Ordinary corporate tax rate (22 %). No patent box regime.
Finland	No patent box regime.
France	Net income of licensing fees relating to certain IP rights can benefit from a 15% income tax rate (plus additional contributions of 3.3% and 10.7%) (the rate is equal to 16% plus social surcharges for companies not subject to CIT)
Germany	No patent box regime.
Ireland	IP income is considered to be active income, subject to a 12.5% tax rate
Italy	According to the patent box regime, up to 50% of income derived from qualifying intangible assets can be deducted from corporate income tax (IRES) and local tax (IRAP). For calendar year taxpayers the percentage excluded from the tax base is 30% in 2015, 40% in 2016 and 50% in 2017
Netherlands	The "innovation box" is available for income from self-produced qualifying intangible assets, taxed at an effective rate of 5%
Spain	The Spanish State General Budget Law for 2016 introduced a new patent box regime applicable from 1 July 2016. These new amendments are based on the relevant agreements reached in the context of the EU and the OECD (in line with the "nexus approach" as defined by BEPS Action 5). The tax allowance percentage ranges to a maximum equivalent to 60% of gross revenues arising from the transfer of the rights of patents, designs or knowhow.
Sweden	IP income is subject to corporate income tax of 22%
Switzerland	IP income may be subject to tax rates of 8.5% - 12% (mixed companies) or 8.8% (license box in the Canton of Nidwalden)
UK	A patent box regime with a tax rate of 10% on qualifying patent-derived income is phased in from April 2013

In Summary

Whether an LS company is commencing its international expansion journey or already has a well-established international footprint, it needs to gain, maintain and enhance competiveness through optimizing its business and tax models. It should be noted that the different patent box regimes have been subject to review from the perspective of potentially harmful tax competition, both by the European Code of Conduct Group and the OECD. Agreement was reached at both EU and OECD levels earlier this year over the framework to determine the benefits of such regimes. Generally speaking, the regimes can remain but for new entrants the benefits will need to be linked to companies' qualifying R&D expenditures. Transitional measures until 2021 are foreseen.

LS companies which rely on these regimes to deliver significant reductions in corporate income tax rates need to review their current arrangements and perform scenario planning to assess how they may be impacted.

Our approach: Value Chain Analysis (VCA) and Site Selection

KPMG applies a structured VCA approach to site selection. A value chain is a set of activities performed by a firm in a particular industry in order to deliver a valuable **product** or **service** to the **market**. VCA involves an in- depth assessment of an industry or organization's value drivers.

This is especially critical when a business is seeking transformational change to respond to a changing market environment, disruptive technologies and / or an evolving regulatory environment. A business may analyze and possible reconfigure international structures and business processes to create structures that align key value drivers with business, operating and tax models.
The new process must be efficient, future-proofed and in accordance with requirements by relevant bodies such as the OECD's BEPS approach.

Profit contribution and mapping

A VCA approach relies on more than just a functional analysis; it uses a value focused, end-to-end, functional analysis. Structured VCA starts with **mapping** an existing value chain and evaluating the relative value of the individual **value drivers** as well as undertaking a profit contribution analysis. These analyses should be performed in close collaboration with key commercial professionals within the business.
Mapping involves a geographical analysis of the location of value drivers and functions, intangible assets, risks, substance/tangible assets and resultant profits. The outcome of such an analysis can be displayed in various formats, including as a user-friendly map that denotes profit, functions and locations.

In the **evaluation** process that follows, a Valuation Heat Map is created which is tested against a set of parameters such as **industry-relevant key trends by value driver** and **compliance with specific tax requirements.**

Typical key value drivers in the LS industries include manufacturing, operational excellence and R&D. Other relevant value drivers are procurement and sales and marketing. For LS companies in particular, potential adjustments to an existing value chain should take the following **key trends** into consideration, as these affect their key value drivers:

- **Manufacturing:** A key trend is creating "standardized manufacturing platforms" which optimize existing manufacturing facilities. Increasingly also the so-called "continuous modular processing" that is gaining traction against the classical batch manufacturing system with a series of "stop-and-start" steps. These two trends support an LS business's **agility**, which can be a huge determinant of success amid today's rapid technological and scientific changes.

- **Operational excellence:** There is a clear trend in the LS industry towards complementing internal **capabilities** with external resources. Managing demand peaks and troughs such as in transportation or staffing can be assisted through active collaboration with suppliers, peer companies or specialized outsourcing firms. Another key trend within operational excellence is the **proper alignment of tax planning with the underlying value chain**". National tax policies have a significant impact on the competitiveness and **value** of an LS company, and only a tax-compliant model can deliver sustainable value over time.

- **R&D:** The possibility of **collaborating with universities** continues to be important. By strengthening ties with academic institutions, LS companies can improve their attractiveness to qualified researchers while simultaneously enhancing their capabilities to deliver commercially relevant research results. Another key trend in the field of R&D is the increased focus on certain tax planning tools such as the beneficial taxation of income from patents or the tax-efficient treatment of R&D costs. Such instruments can significantly improve the return on investment for R&D activities and therefore the **value** of a company (see "Taxes and incentives" section).

From VCA to site selection

The findings of this evaluation are applied to determine whether a structure/risk allocation of an existing value chain is efficient and provides the right set-up for **future growth or restructuring**. Also whether it **is supportable** based on substance/decision-making accountability from a tax point of view or whether adjustments are needed. If an entire or partial redesign of the value chain is needed,

the relocation of values drivers and their related risks and revenue streams are considered. In this instance, a proper **site selection process** needs to be implemented.
For this process, the general site selection factors (as described earlier in this report) such as size of industry clusters, availability of workforce, reliability of infrastructure, possibility of collaboration etc must be matched against the specific **key trends** relevant to each value driver to be relocated. Locations which offer a business environment that enables the application of key trends should be shortlisted.

In parallel to the site selection process, **a properly designed tax model** must be implemented. As outlined above, LS companies with global value chains involving intercompany transactions concerning manufacturing or R&D should recognize the importance of improving their global set-up through the use of tax favorable IP regimes and countries that have introduced additional reliefs.

KPMG's offering

KPMG offers assistance in every step towards selecting a site. This starts with Value Chain Analysis including the identification of key value drivers and definition of key trend parameters for each value driver. Our systematic approach supports a company's achievement of agility and capacity. We combine this analysis with the design of a sustainable tax model to provide for lasting competitive taxation that helps a business maintain competiveness and value.

Our services include:

- Analysis of existing value chain, benchmarking against peers and analyzing its sustainability with regard to BEPS and other regulations
- Design of adjusted value chain model and related tax planning model
- Site selection with a focus on key trends by value driver and on tax planning
- Implementation of a new VCM.

Venture Valuation's offering

Industry Intelligence services

Venture Valuation has built up a global Life Sciences Database – Biotechgate (www.biotechgate.com) – that contains profiles of more than 36,000 LS companies worldwide. Data from Biotechgate are made available to private and public entities interested in regional or topical information on LS companies from the Americas, Europe and Asia.

Valuation services

With access to scientific, product development, regulatory affairs, patenting and financial expertise, Venture Valuation provides comprehensive valuation reports. Inhouse experts perform comprehensive financial and technical valuations that take into account soft factors such as management experience and track record, assessment of scientific and technological quality, intellectual property and market developments and trends (www.venturevaluation.com).

Finance environment

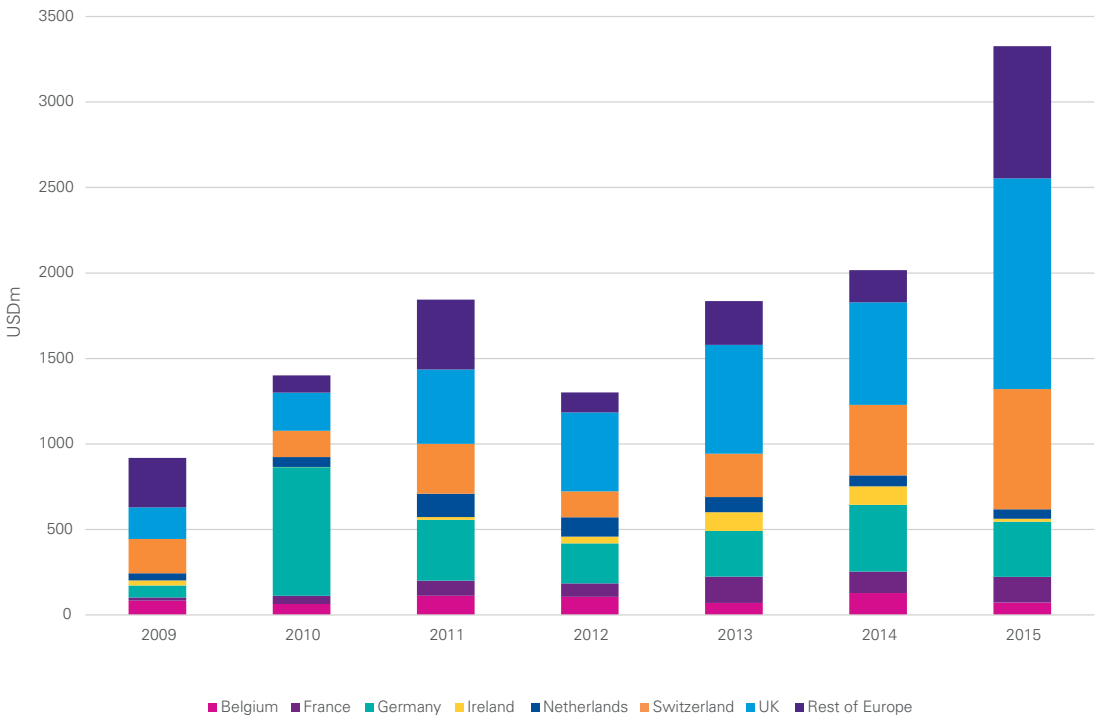
The ability to attract financing is a good indicator of an LS cluster's strength and can help provide a fuller picture of a country's LS industry potential. The data in this chapter compares how the various countries and industries fair in attracting financing.

Financing of privately owned LS companies by country

Private European LS companies raised more than double the amount in 2015 compared to 2010. Within the cluster of the seven countries in the graph, Germany (-48%) raised less money in 2015 than in 2010 while all others raised more. The Netherlands raised less money in 2015 than in each of the prior four years.

The total amount of money raised in 2015 was highest in the UK at USD 1.2 billion, followed by Switzerland at USD 702 million and Germany at USD 323 million. The UK and Switzerland together comprise more than 50% of the total money raised in Europe by private LS sciences companies since 2012; in 2015 it was almost 60%. 2015 saw five financing rounds exceed USD 100 million including Immunocure Ltd. UK, Erib Ltd. Switzerland, Mereo Biopharma Group Ltd. UK, Oxford Nanopore Technologies Ltd, UK and CureVac GmbH, Germany.

Financing of privately owned LS companies (Medtech, Biotech, Pharma)

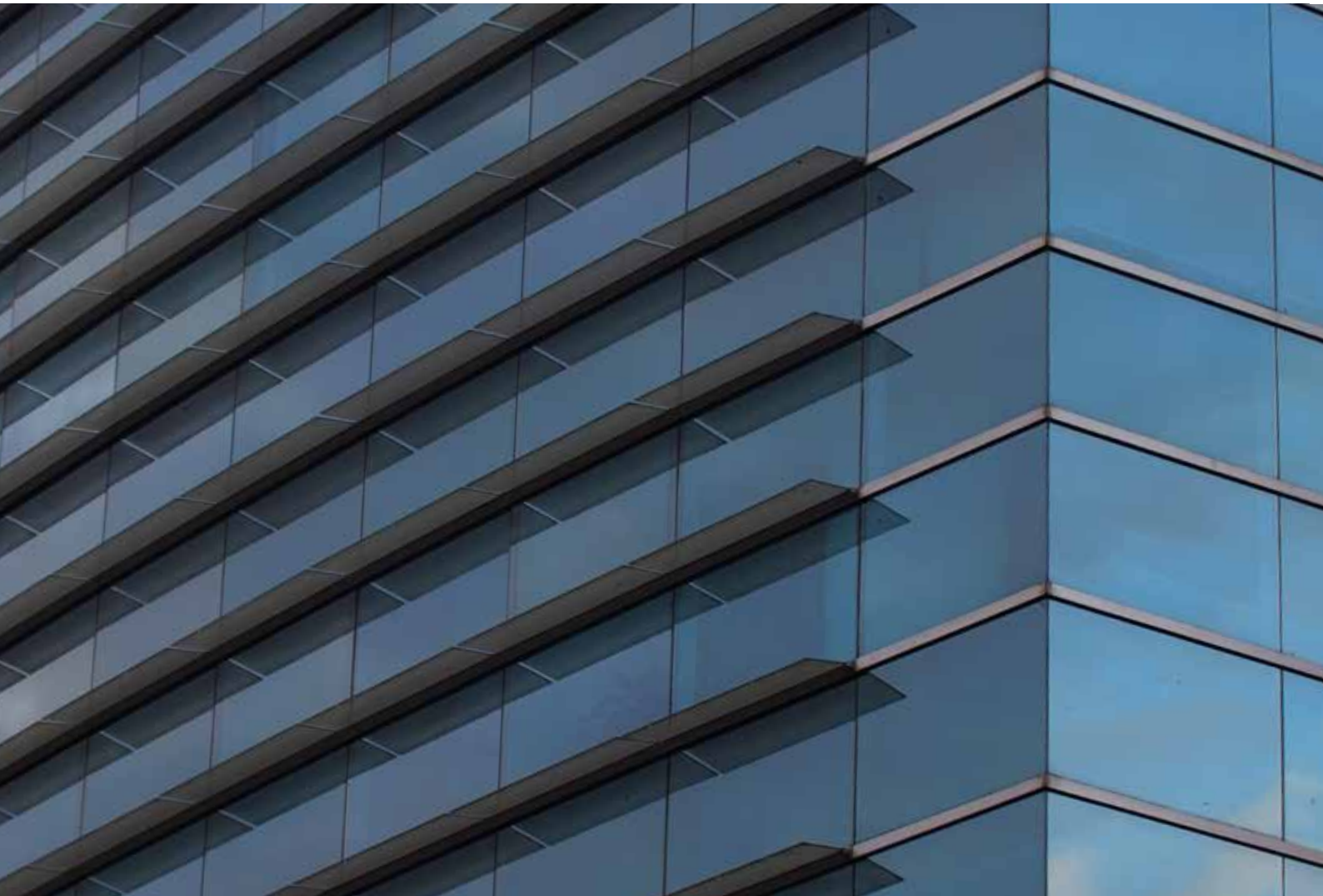


Source: www.biotechgate.com, 2016

KPMG

Largest private financing rounds in Europe 2015 and Jan/Feb 2016

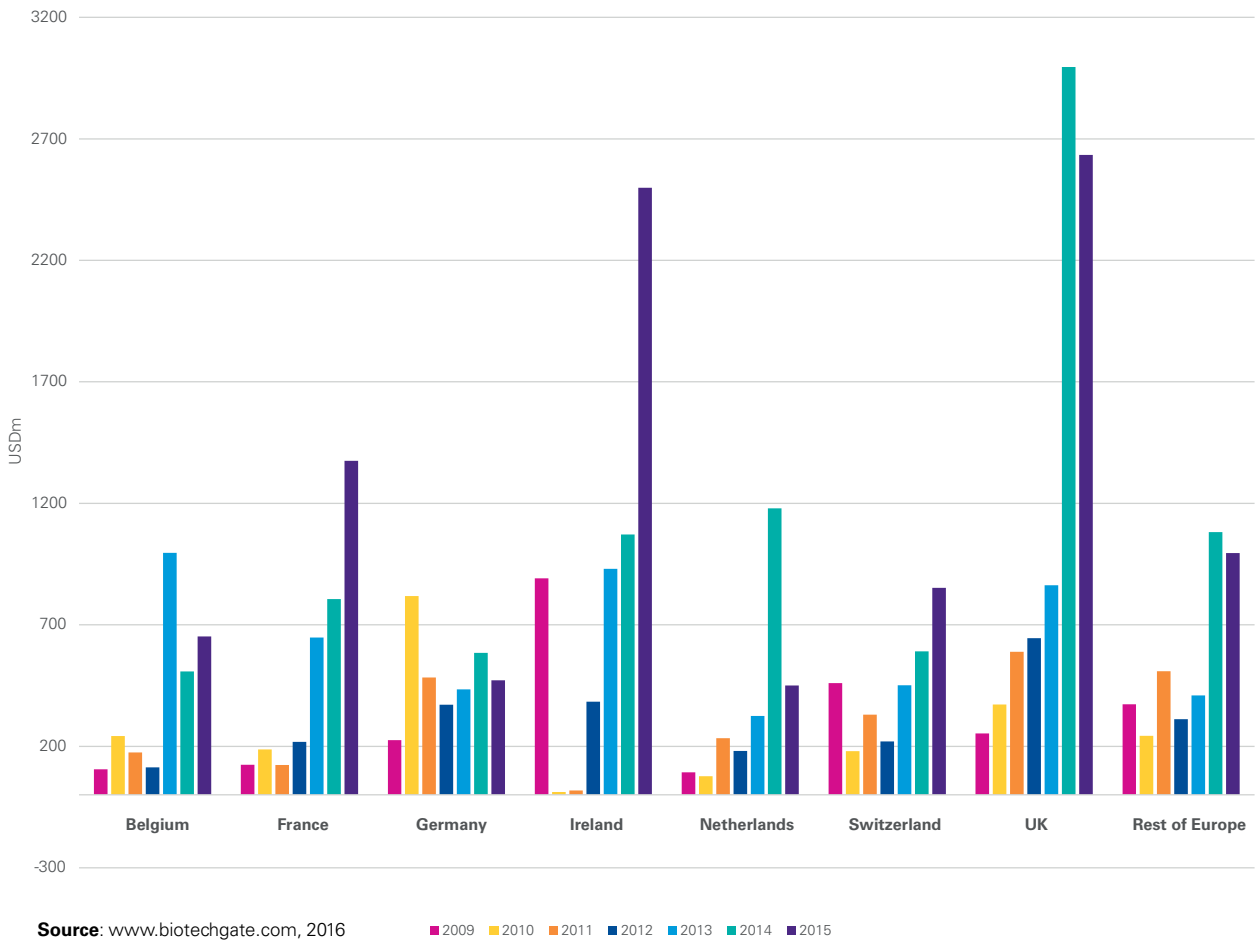
Date	Company	Country	Sector	USDm
7.2015	Immunocore Limited	UK	Biotech - Therapeutics and Diagnostics	320
7.2015	Erib AG	Switzerland	Medical Technology	180
7.2015	Mereo Biopharma Group Ltd	UK	Biotech - Therapeutics and Diagnostics	119
11.2015	CureVac GmbH	Germany	Biotech - Therapeutics and Diagnostics	110
9.2015	CeQur SA	Switzerland	Medical Technology	100
5.2015	Kymab Limited	UK	Biotech - Therapeutics and Diagnostics	90
2.2016	Mission Therapeutics Ltd	UK	Biotech - Therapeutics and Diagnostics	86
9.2015	ADC Therapeutics, Inc	Switzerland	Biotech - Therapeutics and Diagnostics	82
1.2015	Green Biologics Limited	UK	Biotech - other	76
1.2015	Symphogen A/S	Denmark	Biotech - Therapeutics and Diagnostics	73
7.2015	UK	United Kingdom	Biotech/ R&D Services	70
4.2015	CRISPR Therapeutics	Switzerland	Biotechn - Therapeutics and Diagnostics	64
11.2015	ObsEva SA	Switzerland	Biotech - Therapeutics and Diagnostics	60
1.2016	Cardiorentis AG	Switzerland	Biotech - Therapeutics and Diagnostics	60
3.2015	CureVac GmbH	Germany	Biotech - Therapeutics and Diagnostics	56
4.2015	Nabriva Therapeutics AG	Austria	Biotech - Therapeutics and Diagnostics	50



Total financing (public and private) of LS companies by country
In terms of total financing, UK companies raised the most at almost USD 3 billion in 2014 and USD 2.6 billion in 2015, second was Ireland at around USD 1 billion in 2014 and USD 2.5 billion in 2015.

Compared with the Bay Area, which raised USD 18 billion in 2015, the whole of Europe raised only half of this. Often, however, it is a handful of companies that raise a significant proportion – or even the majority – of the amount, such as Gilead Sciences raising USD 10 billion in 2015 in the Bay Area or Endo International plc. raising USD 2.3 billion in Ireland.

Overall financing (public and private) of LS companies by country



Source: www.biotechgate.com, 2016

Regulatory environment

In the EU, the European Medicines Agency (EMA) is responsible for medicine approval and safety monitoring. EU legislation governing medicines is developed by the European Commission (EC) and adopted by the European Parliament together with the Council of the EU. The EC also develops policies in the field of human or veterinary medicines and public health[14].

In Switzerland, Swissmedic – the Swiss Agency for Therapeutic Products – is the authority responsible for authorizing and supervising therapeutic products.

Clinical trials

Drug makers must obtain product approval from the respective regulatory authorities before conducting clinical trials in European countries. In the EU, the conduct and approval of clinical trials is governed by Directive 2001/20/EC. The guidelines specify in particular:

- The information to be submitted to the competent authorities and to the ethics committees
- Requirements on safety monitoring and the reporting of adverse reactions
- Requirements regarding Good Clinical Practice (cGCP), including documentation of clinical trials
- Specific requirements regarding the products and clinical trials
- Inspections by competent authorities and the applicable procedures.

[14] **Sources:** www.ema.europea.eu, www.europa.eu, www.swissmedic.ch, Dr. Regenold GmbH, www.regenold.com

The trial may not begin without authorization from the competent authorities of the EU Member State in which the clinical trial is to be conducted and a positive opinion from an independent ethics committee established by the Member State. Regulatory agencies enforce cGCP through periodic inspections of study sponsors, investigators and trial sites, contract research organizations, and institutional review boards.

Swissmedic also requires adherence to cGCP, and both the EMA and Swissmedic require the protection of clinical trial subjects consistent with the Helsinki declaration on the conduct of medical research on human subjects.

Product approval
Medicinal products for human use that require authorization include synthetic drugs, medicines manufactured using biotechnology, vaccines and blood products. Within the EU, there are several routes to obtain marketing approval, depending on the type of product for which approval is sought.

Centralized procedure
Single application, single evaluation and single authorization. A marketing authorization granted under the centralized procedure is valid in all Member States. This procedure is required for:

- Biological/biosimilar products developed by specific biotechnological processes
- New medicinal products for the following therapeutic indications: acquired immune deficiency syndrome (AIDS), cancer, neurodegenerative disorder, diabetes, auto-immune diseases and other auto- immune dysfunctions and viral diseases
- Orphan medicinal products. To qualify for orphan status, a medicine must target a disease that is life threatening or chronically debilitating and affects fewer than five in 10,000 patients in the EU. If another medicine has already been authorized for the disease, the new medicine must bring a significant benefit to patients over the existing option.

The centralized procedure is optional for medicinal products containing a new active substance and medicinal products that represent a significant therapeutic, scientific or technical innovations or benefit to patients.

Mutual recognition procedure
Applicants submit an application to all EU Member States in which they want authorization. When a state decides to review it, it becomes the reference Member State and other countries may accept or reject that country's decision. Regardless of the approval process, various parties share responsibility for the monitoring, detection and evaluation of adverse events post-approval, including national authorities, the EMA, the EC and the marketing authorization holder. In some regions, it is possible to receive an "accelerated" review whereby the national regulatory authority will commit to truncated review timelines for products that meet specific medical needs.

Decentralized procedure
Applicants submit identical applications to several countries and receive simultaneous approval.

Nationalized procedure
Separate application to and approval determination by each country.

The EMA revised its guidelines in July 2015 for fast-track approval pathways. The revised guidelines for accelerated assessment and conditional marketing authorization are intended for innovative medicines that target a disease for which no treatment is available, or that provide patients with a major therapeutic advantage over existing treatments.

In Switzerland, Swissmedic has the authority for granting marketing authorization, specifying the method of sale (prescription only/ dispensing point) and approving information for healthcare professionals and patients.

Data protection
The Data Protection Directive as implemented in national laws by EU Member States imposes obligations and restrictions on the collection, analysis and transfer of personal data, including health data from clinical trials and adverse event reporting. There is an increasing requirement for clinical trial data transparency in the EU provided in the new EU Clinical Trials Regulation, EMA disclosure initiatives, and voluntary industry commitments.

The Data Protection Directive prohibits the transfer of personal data to countries outside of the EU Member States that do not provide an adequate level of data protection. The US is one such country.

Good manufacturing practices
Regulatory agencies regulate and inspect equipment, facilities, and processes used in the manufacturing and testing of pharmaceutical and biological products prior to approving a product. If, after receiving clearance from regulatory agencies, a company makes a material change to manufacturing equipment, location or process, additional regulatory review and approval may be required. Current Good Manufacturing Practices (cGMP) and product-specific regulations enforced by regulatory agencies following product approval must also be adhered to. The FDA, the EMA and other regulatory agencies also conduct periodic visits to re-inspect equipment, facilities, and processes following the initial approval of a product.

Regulation pertaining to pricing and reimbursement
Within the EU, the primary sources of reimbursement for medicinal products are Member State governments, which are increasingly challenging pricing methodologies and exploring cost containment mechanisms. Member States determine which products their national health systems will reimburse; they may approve a specific price, reimbursement level or pricing mechanism such as volume-based arrangements, caps or reference pricing.

The pricing and reimbursement of medicinal products and medical devices is not harmonized at European level but is the responsibility of the EU Member States. Consequently, there are different statutory health schemes within each country and the pricing and reimbursement of pharmaceuticals and medical devices are subject to varying rules. However, the European Transparency Directive provides some harmonization regarding the transparency of certain measures regulating the pricing and reimbursement of pharmaceuticals.

There are currently three models within the largest EU countries:

- "Free pricing" markets – UK, Germany
- National decision market – France, Switzerland, Belgium, Netherlands, Ireland
- National and regional – Other European countries

The characteristics of the three models vary and their implementation is determined by the latest national requirements, which are under continuous review.

Notwithstanding the lack of harmonized EU legislation on pricing and reimbursement there is cooperation at EU level regarding Health Technology Assessment (HTA) between national HTA organizations. HTA organizations are responsible for assessing products and devices from a clinical and pharma-economic point of view and generally make recommendations to payers whether they should commence negotiations on price and reimbursement.

Irrespective of the different national systems of pricing and reimbursement there is a general trend throughout Europe to increase cost containment measures to control public spend on medicinal products and medical devices. The majority of countries apply pricing measures where the price or margin of a medicinal product are set or controlled by the national governments' health departments. Such pricing controls are in some countries based on HTA procedures, which aim to determine the patient benefit of therapies.

Additional regulations and incentives exist to promote generic and, in some cases, therapeutic substitution of medicinal products.

Source: Input provided by Dr. Regenold GmbH, www.regenold.com

Consequently, while initiatives are taking place to harmonize pricing and reimbursement systems in Europe, they will take time due to national health, economic and political pressures.

Post-authorization regulatory oversight
Marketing authorization holders and manufacturers of medicinal products are subject to broad regulatory oversight by the EMA and/or the competent authorities of the EU Member States. This oversight applies to the pharmacovigilance, advertising, promotion, sale, and distribution, recordkeeping, import and export of medicinal products.

Advertising and promotion
EU Member State laws govern advertising and promotion of medicinal products. The off-label promotion of medicinal products is prohibited in the EU. The applicable laws at EU level and in individual EU Member States also prohibit direct-to-consumer advertising of prescription-only medicinal products. Violations of these rules can result in penalization by administrative measures, fines and/or imprisonment.

Interactions between pharmaceutical companies and physicians are governed by strict laws, regulations, industry self-regulation codes of conduct and physicians' codes of professional conduct in individual EU Member States. It is prohibited within the EU to provide benefits or advantages to physicians to induce or encourage the prescription, recommendation, endorsement, purchase, supply, order or use of medicinal products.

Disclosure of payments to healthcare professionals and organizations
The European Federation of Pharmaceutical Industries and Associations (EFPIA) is the representative body of the pharmaceutical industry in Europe. Its members are the national industry associations of individual European countries (member associations) and leading pharmaceutical companies (corporate members). EFPIA membership also includes European biopharmaceutical enterprises and European vaccines manufacturers. The countries with members associations are Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine and the UK.

EFPIA has issued codes governing the way the pharmaceutical industry interacts with the medical and patient communities.

Beginning in 2016, EFPIA members are required to disclose calendar year 2015 transfers of value to healthcare professionals HCPs/ healthcare organizations HCOs including research and development, donations and grants, contributions to costs related to events, and fees for services and consultancy.

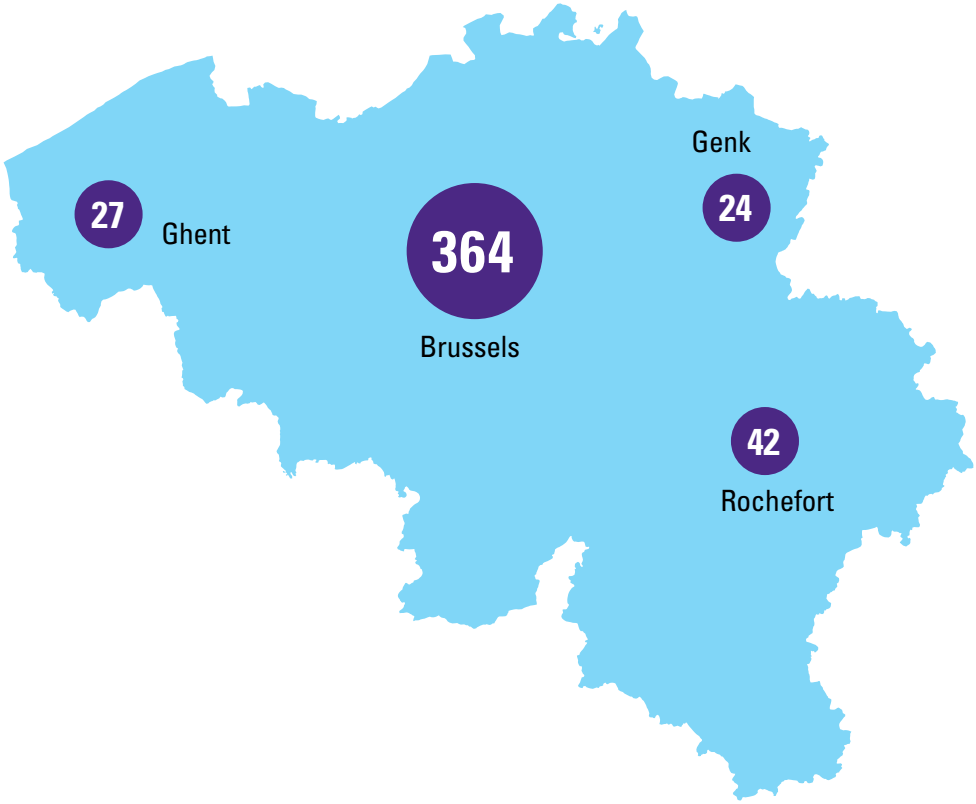
KPMG

Country Quick Facts

Belgium

Quick facts		
Facts and figures	■ Total population: around 11.3 million ■ Size: 30,528 sqm ■ % of workforce that is international: 10.38% ■ Employees in Life Sciences: 60,000 ■ GDP per person PPP: USD 46,290 ■ Current account balance in % of GDP: 0.3% ■ Unemployment rate: 8.5 % ■ Large international airports in Brussels	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	51 22 44 23
Further information	■ Bio.be Association: www.essenscia.be	

LS clusters in Belgium
(Number of companies)



Belgium LS industry structure – overview

Number of companies in Belgium	
Biotechnology	265
Medtech	135
Pharma	74

Number of global and regional HQs of LS companies in Belgium

	Global HQs	Regional HQs
Biotechnology	20	12
Medtech	9	8
Pharma	7	3

Source: www.biotechgate.com

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
The tax rate is 33%, though a surcharge of 3% is levied in addition, resulting in a combined rate of 33.99%. Lower rates are applicable for profits of up to EUR322,500, starting with 24.96% for the first EUR25,000. Because of the notional interest deduction (applicable to all corporate taxpayers), the average effective corporate can be much lower (26.7% in 2014)	Patent Income Deduction reduces the applicable tax rate to maximum 6.8% on qualifying income	n/a	For R&D investments, an additional deduction from the taxable basis is available either as a one-off deduction calculated as 13.5% of the investment value or spread in time at 20.5% of the annual depreciation on the assets. This comes on top of the regular depreciation expense. An alternative R&D tax credit is calculated as the investment deduction multiplied by the nominal corporate income tax rate. This R&D tax credit is cash refundable if not utilized after 5 years. Companies that employ scientific researchers benefit from a partial exemption from payment of withholding tax on their wages. They must transfer only 20% of the withholding tax due on the wage of these researchers to the tax authorities while they withhold the 100% that would normally be due. The measure has thus no impact on the tax situation of the researchers and generates a cash subsidy for the employer. Premiums and capital or interest subsidies on tangible and intangible assets granted by regional institutions within the framework of support to R&D are fully exempt from corporate tax	Financial support is available in various forms

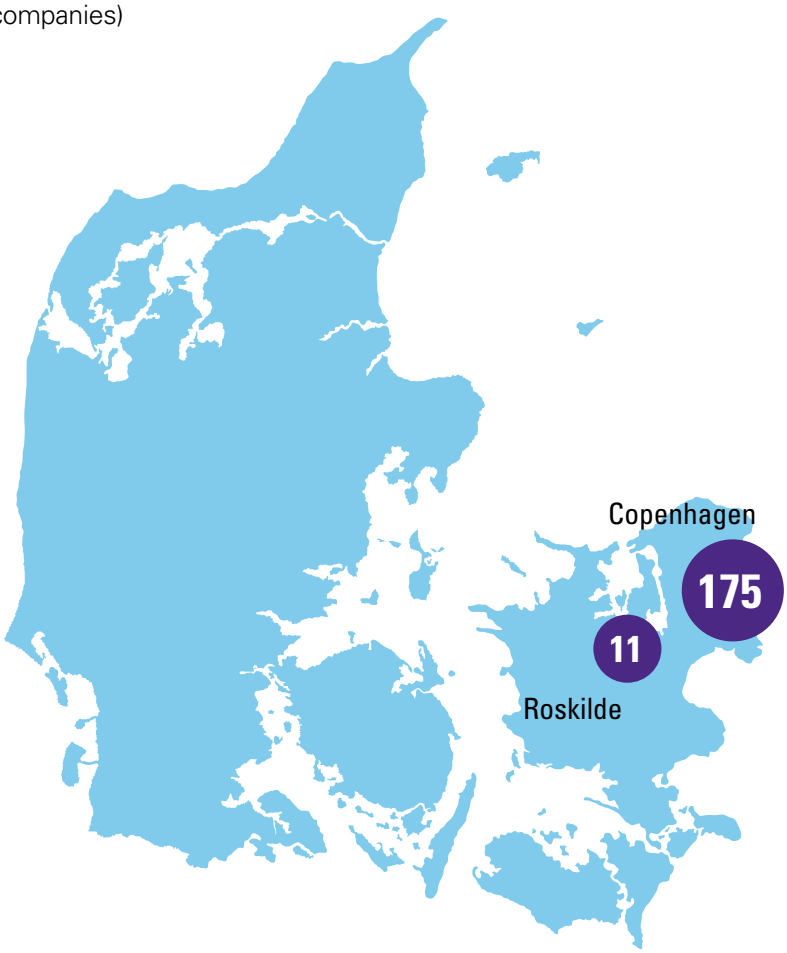
Examples of domestic LS Companies with global HQs in Belgium

Companies			
Name	**Employees**	**Public/Private**	**Sector**
UCB Pharma	8,684	Public	Pharma
Barco N.V.	4,000	Public	Medtech
Ion Beam Applications	1,100	Public	Medtech
Nuscience Group	700	Private	Biotechnology
Eurogentec	325	Private	Biotechnology

Denmark

Quick facts		
Facts and figures	■ Total population around 5.7 million ■ Size: 42,900 sqm ■ % of workforce that is international: 5.53 % ■ GDP per person PPP: USD46,290 ■ Current account balance in % of GDP: 6.3% ■ Unemployment rate: 6,8% ■ Large intl. airport in Copenhagen	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	2 9 12 8
Further information	■ Dansk Biotech Association: www.danskbiotek.dk	

LS clusters in Denmark
(Number of companies)



Denmark LS industry structure – overview

Number of companies in Denmark	
Biotechnology	137
Medtech	71
Pharma	10

Number of global and regional HQs of LS companies in Denmark

	Global HQs	Regional HQs
Biotechnology	20	12
Medtech	9	8
Pharma	7	3

Source: www.biotechgate.com

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
The main corporate income tax rate is 22%	Ordinary corporate tax rate (22 %). No patent box regime	n/a	Tax incentives for R&D are available, including instant tax deduction for R&D costs or depreciation over 5 years and unlimited loss carry-forward. In addition growth credit is available, whereby losses on certain R&D activities can be converted to payment (based on a tax value of 22%) from the tax authorities. Maximum payment per year is the tax value of DKK 25 million	Acquisition of patents and knowhow is fully tax deductible in year 1. Acquisition of other intangibles is depreciated over 7 years

Examples of domestic LS Companies with global HQs in Denmark

Companies			
Name	**Employees**	**Public/Private**	**Sector**
Novo Nordisk A/S	41.500	Publicly traded, Trust-controlled	Pharma
Novozymes A/S	6200	Public	Biotechnology
H Lundbeck A/S	5.500	Publicly traded, Trust-controlled	Pharma
LEO Pharma A/S	4.600	Trust-owned	Pharma
Chr Hansen A/S	2.500	Publicly traded	Industrial biotech
ALK Abelló A/S	1.800	Publicly traded	Vaccines
CMC Biologics A/S	400	Private	Contract manufacturing
Bavarian Nordic A/S	250	Publicly traded	Vaccines
Genmab A/S	200	Publicly traded	Pharma

Finland

Quick facts		
Facts and figures	■ Total population: around 5.63 million ■ Size: 338,424 sqm ■ % of workforce that is international: 2.7% ■ GDP per person PPP: USD41,040 ■ Current account balance in % of GDP: 0.2% ■ Unemployment rate: 8.66% ■ Large intl. airport in Helsinki	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	49 31 24 20
Further information	■ FIB Association: www.finbio.net	

LS clusters in Finland
(Number of companies)

Finland LS industry structure – overview

Number of companies in Finland	
Biotechnology	82
Medtech	37
Pharma	10

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
Corporate tax rate is 20%; same rate is applied to capital gains	20%	20%	100% extra deduction on paid R&D salaries. Maximum extra deduction is limited to EUR 400,000 per year	Tax depreciation on production capital expenditure is maximum 50% in 2013-2016 on machinery and maximum 14% on buildings

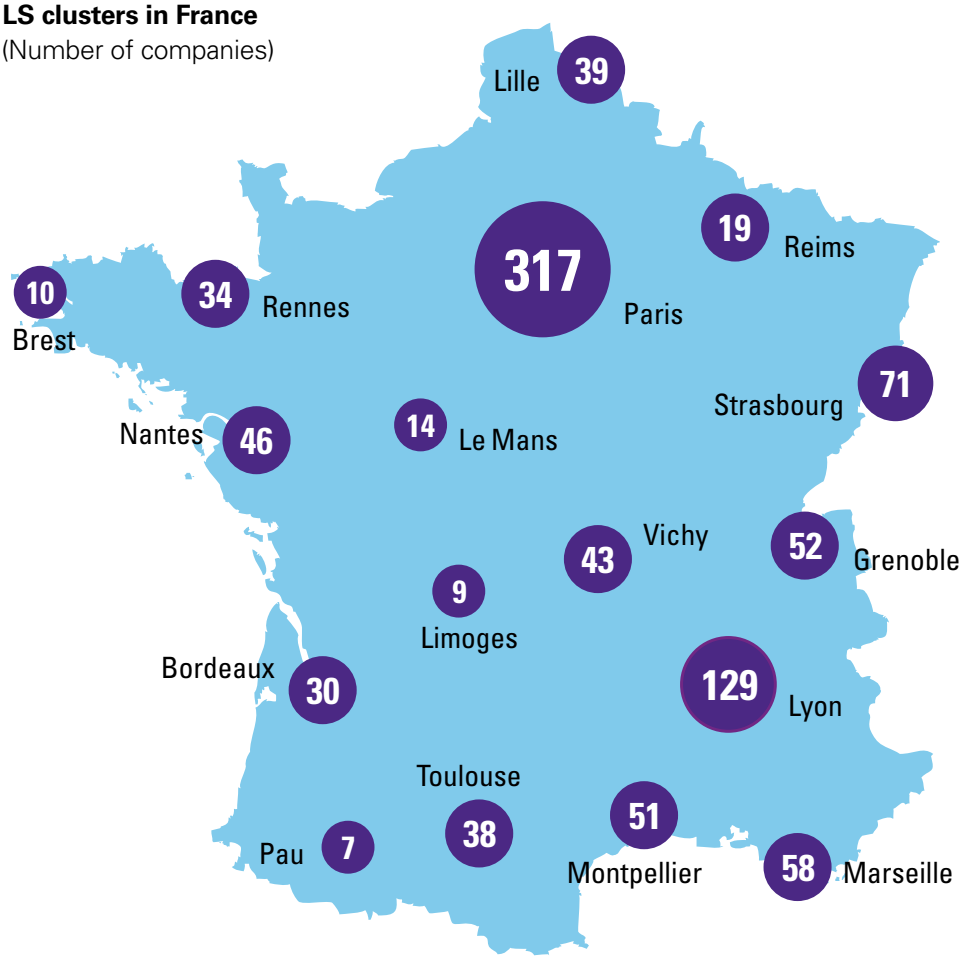
Examples of domestic LS Companies with global HQs in Finland

Companies			
Name	**Employees**	**Public/Private**	**Sector**
Orion Corporation	3400	Public	Pharma
Raisio plc	1900	Public	Biotechnology
Vitabalans Ltd	170	Private	Pharma

France

Quick facts		
Facts and figures	■ Total population: around 51 million ■ Size: 260,558 sqm ■ % of workforce that is international: 5.84% ■ Employees in Life Sciences: 146,000 ■ GDP per person PPP: USD41,370 ■ Current account balance in % of GDP: -0.4%% ■ Unemployment rate: 10.48% ■ Large intl. airports in Paris, Marseille and Nice	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	57 27 75 32
Further information	■ France Biotech Association: www.france-biotech.org	

LS clusters in France
(Number of companies)



France LS industry structure – overview

Number of companies in France	
Biotechnology	720
Medtech	160
Pharma	94

Number of global and regional HQs of LS companies in France

	Global HQs	Regional HQs
Biotechnology	64	12
Medtech	31	3
Pharma	17	10

Source: www.biotechgate.com

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
The maximum corporate tax rate is 38% including the standard CIT rate of 33.33% and additional contributions (3.3% social contribution and 10.7% temporary exceptional contribution – which should be applicable until financial years closed on Dec. 31, 2016). Small and medium size companies are subject to a corporate income tax rate of 15% for taxable profits of up to EUR 38,120	Net income of licensing fees relating to certain IP rights can benefit from a 15% income tax rate (plus additional contributions of 3.3% and 10.7%) (the rate is equal to 16% plus social surcharges for companies not subject to CIT)	n/a	R&D tax credit of 30% for the portion of R&D expenses below EUR 100 million is available, reduced to 5% for the portion exceeding that amount	Financial support is available in various forms. In addition, small and mid-sized innovative start-up companies ("JEI") may benefit under certain conditions from a one-year corporate tax exemption and a 50% rebate for the following year. A new temporary measure enacted on August 6, 2015 provides that companies can benefit under certain conditions from an exceptional deduction on assets depreciation (deduction from the taxable result of 40% of the asset's fair value excluding financial expenses) for industrial assets purchased or manufactured between April 15, 2015 and April 14, 2016

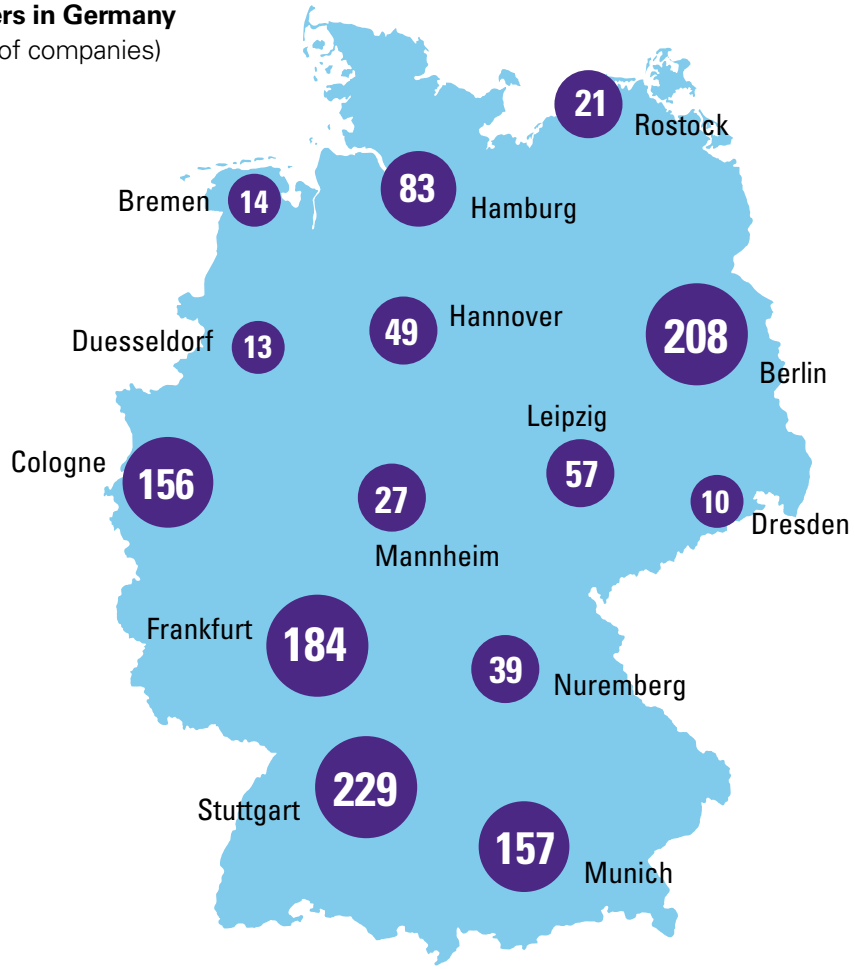
Examples of domestic LS Companies with global HQs in France

Companies			
Name	**Employees**	**Public/Private**	**Sector**
Sanofi S.A.	110,000	Public	Pharma
Danone SA	104,642	Public	Biotechnology
Essilor International	55,000	Public	Medtech
Servier Laboratories	22,000	Private	Pharma
Bel Group	11,000	Private	Biotechnology
Pierre Fabre	10,000	Private	Pharma

Germany

Quick facts		
Facts and figures	■ Total population: around 81 million ■ Size: 137,847 sqm ■ % of workforce that is international: 9.27% ■ Employees in Life Sciences: 247,000 ■ GDP per person PPP: USD 46,780 ■ Current account balance in % of GDP: 8.00% ■ Unemployment rate: 4.7% ■ Large intl. airports in Frankfurt, Munich and Berlin	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	41 4 17 10
Further information	■ BIO Deutschland Association: www.biodeutschland.org ■ DIB Association: https://www.vci.de	

LS clusters in Germany
(Number of companies)



Germany LS industry structure – overview

Number of companies in Germany	
Biotechnology	1,042
Medtech	572
Pharma	103

Number of global and regional HQs of LS companies in Germany

	Global HQs	Regional HQs
Biotechnology	72	9
Medtech	68	8
Pharma	18	8

Source: www.biotechgate.com

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
Corporate income tax amounts to 15% (plus 5.5% solidarity surcharge thereon) and trade tax amounts to around 7% to 17.15% (average approx.14%, depending on municipality), resulting in a total tax rate of 22.8% to 33.0% (average approx. 30%)	n/a	n/a	Germany does not offer R&D tax incentives. Instead state grants in cash for eligible R&D projects are applicable	Financial support is available in various forms, e.g. regional subsidies as well as subsidies at European, federal and state level

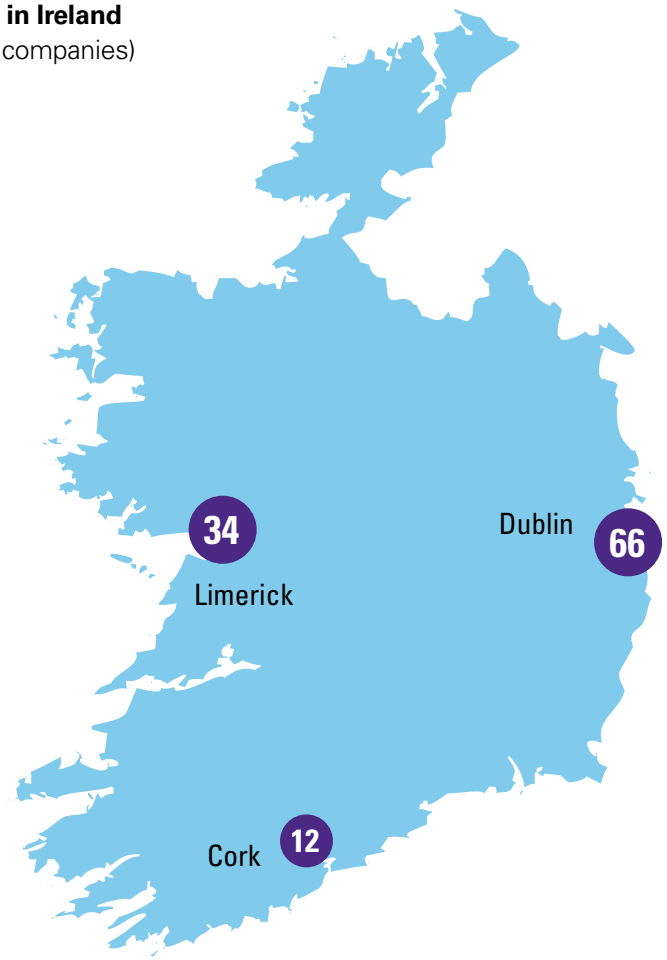
Examples of domestic LS Companies with global HQs in Germany

Companies			
Name	**Employees**	**Public/Private**	**Sector**
Bayer AG	118,900	Public	Pharma
BASF SE	113,351	Public	Biotechnology
Fresenius Medical Care AG & Co.	101,543	Private	Medtech
Boehringer Ingelheim GmbH	47,700	Private	Pharma
Beiersdorf AG	18,000	Private	Biotechnology

Ireland

Quick facts		
Facts and figures	■ Total population: around 4.6 million ■ Size: 32,595 sqm ■ % of Intl. Workforce: 15.35% ■ Employees in Life Sciences: 27,000 ■ GDP per person PPP: USD 51,800 ■ Current account balance in % of GDP: 3.8% ■ Unemployment rate: 9.5% ■ Large intl. airports in Dublin	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	18 34 8 16
Further information	■ IBIA Association: www.imda.ie	

LS clusters in Ireland
(Number of companies)



Ireland LS industry structure – overview

Number of companies in Ireland	
Biotechnology	65
Medtech	39
Pharma	11

Number of global and regional HQs of LS companies in Ireland

	Global HQs	Regional HQs
Biotechnology	15	2
Medtech	10	1
Pharma	4	3

Source: www.biotechgate.com

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
The corporate income tax rate for non-trading income is 25% whereas trading income may be made subject to a 12.5% rate. Capital gains are subject to a 33% rate	IP income is considered to be active income, subject to 12.5% tax rate	The corporate income tax rate on trading income is 12.5%	Ireland also provides a tax credit of 25% of capital and revenue expenditure on qualifying research and development expenditure. It is possible to claim excess R&D credits as a cash refund	Certain start-up companies are exempt from tax in each of their first 3 years

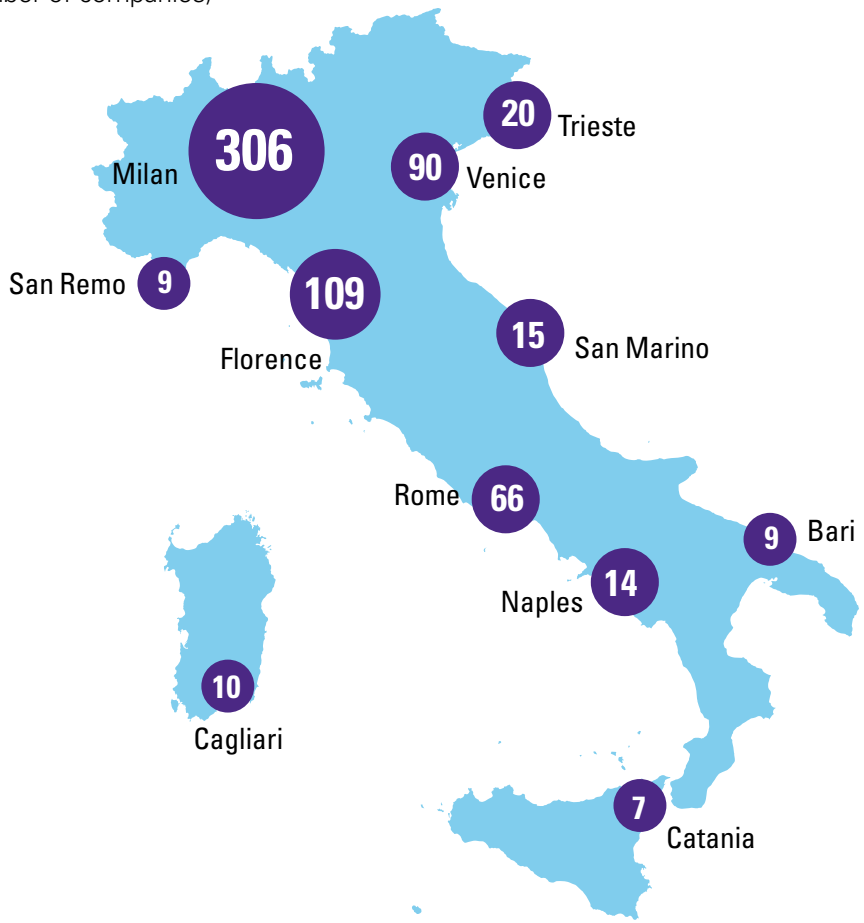
Examples of domestic LS Companies with global HQs in Ireland

Companies			
Name	**Employees**	**Public/Private**	**Sector**
Medtronic	80,000	Public	Medtech
ICON Clinical Research	10,000	Public	Biotechnology
Shire	5,300	Public	Pharma
Endo International plc.	5,000	Public	Pharma
Alkermes plc	1,300	Public	Pharma

Italy

Quick facts		
Facts and figures	■ Total population: around 60.8 million ■ Size: 301,338 sqm ■ % of workforce that is international: 6.60% ■ GDP per person PPP: USD36,740 ■ Current account balance in % of GDP: 2.0% ■ Unemployment rate: 12.7% ■ Large intl. airports in Rome, Milan	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	52 52 86 38
Further information	■ Assobiotec Association: www.assobiotec.federchimica.it	

LS clusters in Italy
(Number of companies)



Italy LS industry structure – overview

Number of companies in Italy	
Biotechnology	518
Medtech	104
Pharma	87

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
Italian corporate entities are subject to a corporate income tax known as IRES, and to a regional production tax known as IRAP. The standard rates are as follows: • 27.5% for IRES • 3.9% for IRAP The IRES rate will be reduced from 27.5% to 24% from 2017. For 2016 it remains unchanged	According to the patent box regime, up to 50% of income derived from qualifying intangible assets can be deducted from corporate income tax (IRES) and local tax (IRAP). For calendar year taxpayers the percentage excluded from the tax base is 30% in 2015, 40% in 2016 and 50% in 2017.	n/a	Until 2019 any company investing in R&D activities can be eligible for R&D tax credit of up to EUR 5 million per year. The relief is calculated on the basis of incremental expenditure*, up to a maximum of: • 50% of costs for highly qualified personnel and outsourcing research contracts • 25% of depreciation costs and technical and industrial property expertise costs * of the average of R&D investments of the three tax periods preceding the current one at 31 December 2015 (being 2012, 2013 and 2014).	Italy has the following other taxation incentives: • contribution for the purchase of property, plant and equipment • incentives related to the economic increase in patent values • facilities to access financial sources reserved for SMEs • credit lines granted to innovative projects based on the use of industrial property rights • facilitated funding aimed at supporting internationalization of SMEsat supporting internationalization of SMEs

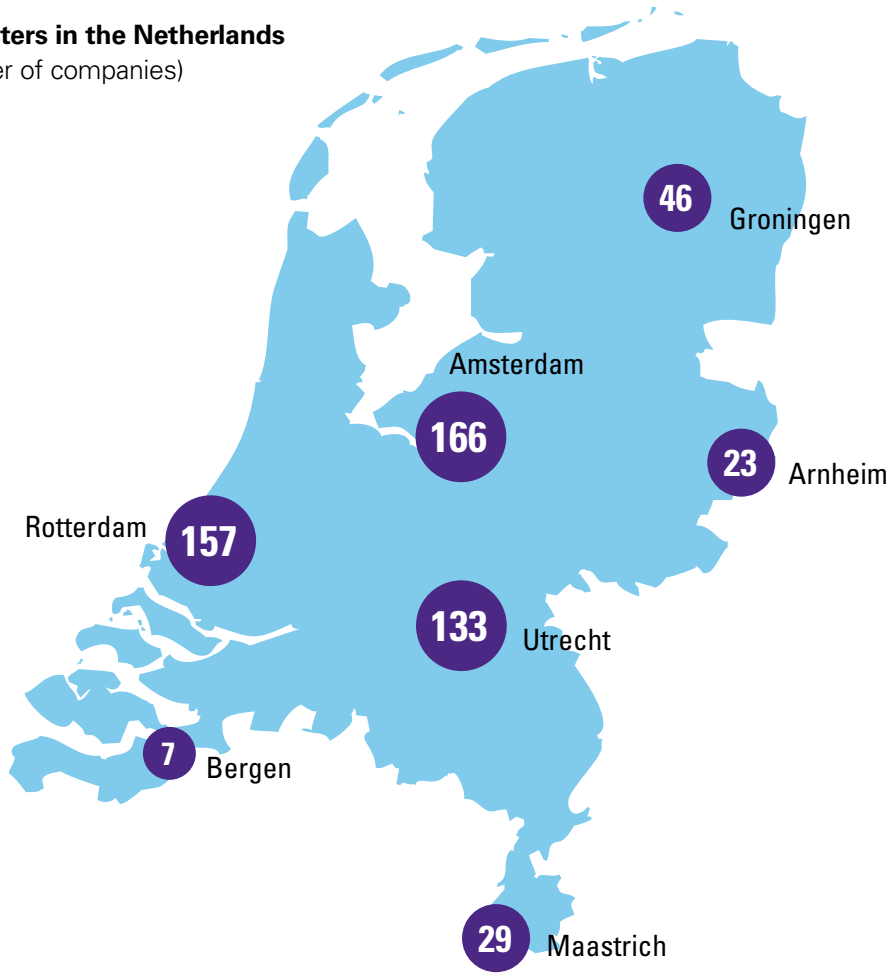
Examples of domestic LS Companies with global HQs in Italy

Companies			
Name	**Employees**	**Public/Private**	**Sector**
Menarini Group	16,500	Private	Pharma
Angelini Group	3,800	Private	Pharma
Chiesi Farmaceutici Spa	3,800	Private	Pharma

The Netherlands

Quick facts		
Facts and figures	■ Total population: around 16.9 million ■ Size: 16,039 sqm ■ % of workforce that is international: 3.90% ■ Employees in Life Sciences: 26,500 ■ GDP per person PPP: USD49,585 ■ Current account balance in % of GDP: 9.1% ■ Unemployment rate: 6.8% ■ Large intl. airports in Amsterdam and Rotterdam	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	45 11 16 15
Further information	■ HollandBIO Association: www.hollandbio.nl	

LS clusters in the Netherlands
(Number of companies)



The Netherlands LS industry structure – overview

Number of companies in the Netherlands	
Biotechnology	409
Medtech	117
Pharma	40

Number of global and regional HQs of LS companies in the Netherlands

	Global HQs	Regional HQs
Biotechnology	30	8
Medtech	10	4
Pharma	6	5

Source: www.biotechgate.com

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
The headline rate of corporate income tax is 25% levied on taxable profits (including capital gains) in excess of EUR200,000. The rate applicable to the first EUR200,000 of taxable profits is 20%	The "innovation box" is available for income from self-produced qualifying intangible assets, taxed at an effective rate of 5%	n/a	Companies deriving income from qualifying R&D activities are entitled to an additional 60% deduction of the costs and expenses relating to these activities. In addition, a wage tax reduction of 35% is granted to employers with respect to salaries, up to a ceiling of EUR250,000, paid to employees who carry out certain research and development (R&D) activities. For start-up companies developing technological products, this reduction is increased to 50%. For wage costs above this ceiling, the reduction is limited to 14	Financial support is available in various forms

Examples of domestic LS Companies with global HQs in the Netherlands

Companies			
Name	**Employees**	**Public/Private**	**Sector**
Philips Healthcare	37,500	Public	Medtech
DSM	24,500	Private	Biotechnology
Friesland Campina	19,000	Private	Biotechnology
QIAGEN Benelux B.V.	4,000	Public	Biotechnology
Sanquin Blood Supply	3,000	Private	Biotechnology

Spain

Quick facts		
Facts and figures	■ Total population: around 46,54 million ■ Size: 505,990 sqm ■ % of workforce that is international: 13.19% ■ GDP per person PPP: USD34,960 ■ Current account balance in % of GDP: 1.3% ■ Unemployment rate: 24.40% ■ Large intl. airports in Madrid and Barcelona	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	43 51 43 37
Further information	■ ASEBIO Association: www.asebio.com	

LS clusters in Spain
(Number of companies)

Spain LS industry structure – overview

Number of companies in Spain	
Biotechnology	421
Medtech	80
Pharma	60

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
Tax rate was reduced to 25% in 2016 (28% in 2015) for SMEs.	The Spanish State General Budget Law for 2016 introduced a new patent box regime applicable from 1 July 2016. These new amendments are based on the relevant agreements reached in the context of the EU and the OECD (in line with the "nexus approach" as defined by BEPS Action 5). The tax allowance percentage ranges to a maximum equivalent to 60% of gross revenues arising from the transfer of the rights of patents, designs or knowhow.	n/a	There is the possibility to apply for a tax credit on expenses and certain investments made on R&D which distinguish between R&D projects and Technological Innovation projects. The general applicable fixed percentage rate for R&D tax credit is 25%, but if yearly expenses exceed the average expense of the preceding two years, 42% will be applicable to the excess. An additional 17% credit is available for personnel expenses relating to qualified researchers and 8% for investment in assets (excluding real estate) exclusively affected by R&D. In addition, a tax credit of 12% of the expenses incurred on technological innovation in the tax period can be deduced from the tax liability.	There is a reduced tax rate (15%) for new enterprises.

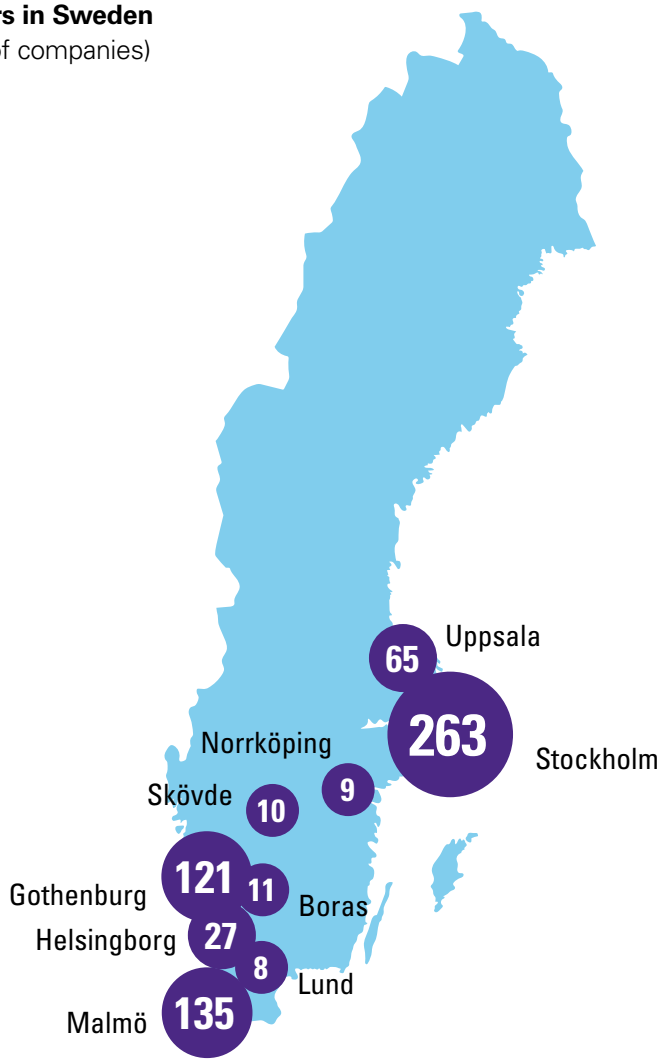
Examples of domestic LS Companies with global HQs in Spain

Companies			
Name	**Employees**	**Public/Private**	**Sector**
Esteve	2,900	Private	Pharma
Almirall, S.A	2,000	Public	Pharma
Laboratorios Farmacéuticos Rovi S.A.	1,109	Public	Pharma

Sweden

Quick facts		
Facts and figures	■ Total population: around 9.75 million ■ Size: 450,295 sqm ■ % of workforce that is international: 4.30% ■ GDP per person PPP: USD47,170 ■ Current account balance in % of GDP: 5.9% ■ Unemployment rate: 7.93% ■ Large intl. airport in Stockholm	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	42 19 26 9
Further information	■ SwedenBio Association: www.swedenbio.com	

LS clusters in Sweden
(Number of companies)



Sweden LS industry structure – overview

Number of companies in Sweden	
Biotechnology	408
Medtech	301
Pharma	41

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
The corporate income tax rate is currently 22%	IP income is subject to corporate income tax of 22%	The corporate income tax rate on trading income is 22%	Limited R&D incentives are available for certain companies. Maximum potential saving of SEK 230,000 per month, i.e. SEK 2,760,000 per year and group through reducing employer social security costs.	n/a

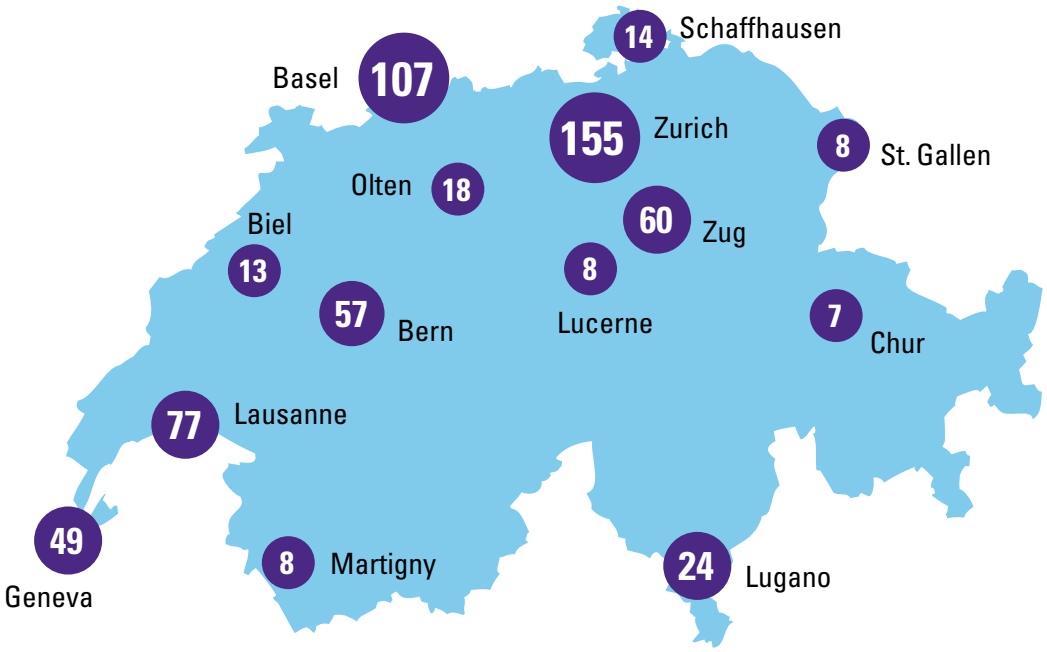
Examples of domestic LS Companies with global HQs in Sweden

Companies			
Name	**Employees**	**Public/Private**	**Sector**
Getinge AB	15747	Public	Medical Technology
Molnlycke Health Care AB	7400	Private	Medical Technology
Swedish Orphan Biovitrum AB	589	Public	Biotechnology

Switzerland

Quick facts		
Facts and figures	■ Total population: around 8.2 million ■ Size: 15,940 sqm ■ % of workforce that is international: 22.97% ■ Employees in Life Sciences: 105,000 ■ GDP per person PPP: USD60,710 ■ Current account balance in % of GDP: 12% ■ Unemployment rate: 3.1% ■ Large intl. airports in Geneva, Basel, Zurich	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	1 2 4 4
Further information	■ Swiss Biotech Association: www.swissbiotech.org ■ Scienceindustries Association: www.scienceindustries.ch	

LS clusters in Switzerland
(Number of companies)



Switzerland LS industry structure – overview

Number of companies in Switzerland	
Biotechnology	346
Medtech	225
Pharma	47

Number of global and regional HQs of LS companies in Switzerland

	Global HQs	Regional HQs
Biotechnology	36	11
Medtech	45	8
Pharma	16	3

Source: www.biotechgate.com

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
Income taxes are applied on federal, cantonal and communal level in Switzerland. The pre-tax corporate income tax rates range between 11.4% and 24.4% (depending on municipality)	IP income may be subject to tax rates of 8.5% -1 2% (mixed companies) or 8.8% (license box in the Canton of Nidwalden)	Trading income may be subject to tax rates of 5% (principal companies) or 8.5% - 12% (mixed companies)	Accruals for future R&D projects executed by third parties are permitted in an amount of up to 10% of the taxable profit, maximum CHF 1 million	Full or partial tax holidays of up to ten years on cantonal and – in certain regions – federal tax level can be granted to substantial investment projects In addition, funding in case of a collaboration between the company and a university may be available

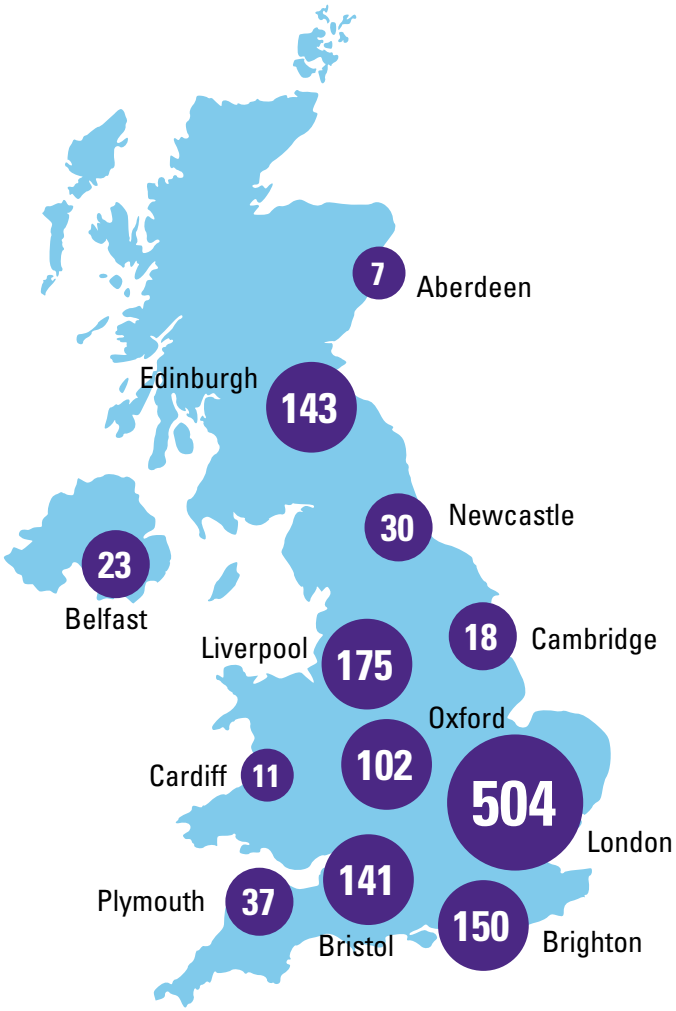
Examples of domestic LS Companies with global HQs in Switzerland

Companies			
Name	**Employees**	**Public/Private**	**Sector**
Novartis International AG	120,000	Public	Pharma
F. Hoffmann-La Roche Ltd	80,000	Public	Pharma
Syngenta International AG	27,000	Public	Biotechnology
Lonza	10,000	Public	Biotechnology
Galenica Ltd.	6,089	Public	Pharma

United Kingdom

Quick facts		
Facts and figures	■ Total population: around 64.8 million ■ Size: 94,060 sqm ■ % of workforce that is international: 8.64% ■ Employees in Life Sciences: 174,000 ■ GDP per person PPP: USD41,300 ■ Current account balance in % of GDP: -4.7% ■ Unemployment rate: 5.6% ■ Large intl. airports in London (4) and Manchester	
International rankings	■ Flexibility of labor regulation ■ Quality of life ■ Index of economic freedom ■ Global competitiveness	15 40 10 19
Further information	■ BIA Association: www.bioindustry.org	

LS clusters in the UK
(Number of companies)



UK LS industry structure – overview

Number of companies in the UK	
Biotechnology	979
Medtech	275
Pharma	110

Number of global and regional HQs of LS companies in the UK

	Global HQs	Regional HQs
Biotechnology	96	16
Medtech	38	3
Pharma	12	18

Source: www.biotechgate.com

Ordinary tax rates	Tax rates applicable to IP income	Tax rates applicable to trading income	R&D tax incentives	Other incentives
The main corporate income tax rate is 23%. Profits up to GBP 200,000 are taxed at a rate of 20%. Marginal relief applies to profits between GBP 300,000 and GBP 1.5 million	A new patent box regime with a tax rate of 10% on qualifying patent-derived income is phased in from April 2013	n/a	Tax incentives for R&D expenditure are available, with an enhanced deduction of 130% for large companies and of 230% for small and mid-sized enterprises. R&D relief is also available in respect of qualifying expenditure by large companies on research into certain vaccines for human use. There is an "above-the-line" tax credit for large companies (also known as an "R&D expenditure credit"). Initially, the credit is available upon election (i.e. a taxpayer may elect to apply the credit in place of the deduction), but will become mandatory by April 2016. The credit is equivalent to 11% (10% before 1 April 2015) of qualifying expenditure	Twenty-four new enterprise zones have been set up in economically declining areas of the UK. Possible measures include a five-year holiday up to GBP 275,000

Examples of domestic LS Companies with global HQs in the UK

Companies			
Name	**Employees**	**Public/Private**	**Sector**
GlaxoSmithKline plc	97,921	Public	Pharma
AstraZeneca plc	57,500	Public	Pharma
Smith & Nephew plc	11,000	Public	Medtech
Almac Group	3,300	Private	Biotechnology
Huntingdon Life Science	1,600	Private	Biotechnology

Contact us

Hartley Powell
KPMG in the US
Principal, Global Head
Global Location and Expansion Services
Charlotte, USA

T: +1 704 335 55 83
E: whpowell@kpmg.com

www.kpmg.com

André Guedel
KPMG in Switzerland
Head Sales and Business
Development Tax
Zurich/Geneva, Switzerland

T: +41 58 249 28 24
E: aguedel@kpmg.com

www.kpmg.ch

Patrik Frei
Venture Valuation AG
CEO
Singapore/ Switzerland

T: +41 43 321 86 60
E: p.frei@venturevaluation.com

www.venturevaluation.com

Nathalie Moll
EuropaBio, the European Association for Bioindustries
EuropaBio Secretary General
Brussels, Belgium

T: +32 2 739 11 75
E: n.moll@europabio.org

www.europabio.org

kpmg.com/socialmedia

kpmg.com/app

Download on the App Store

www.kpmg.ch/siteselection

Concept: André Guedel, Jessica Burri (KPMG). Text: André Guedel, Kathleen Tench (KPMG), Patrik Frei, Dr. Regenold GmbH, Nathalie Moll. KPMG in Switzerland, June 2016.