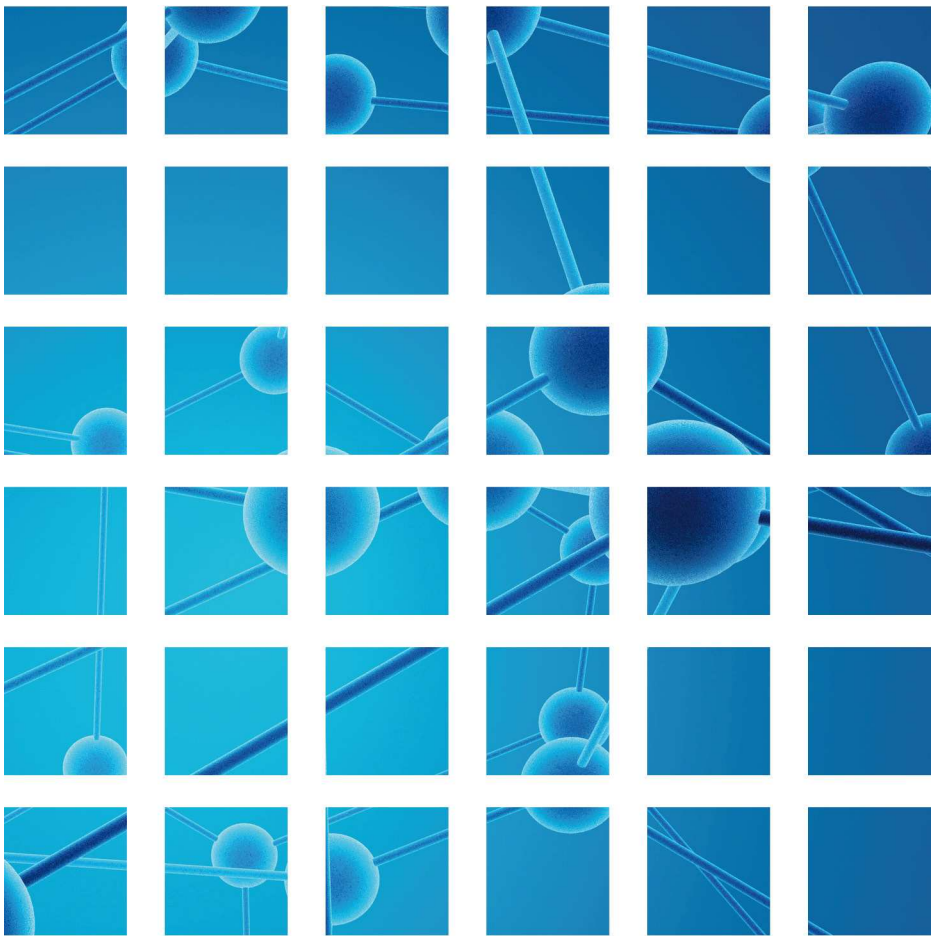
MONITORING LIFE SCIENCES LOCATIONS

Life Sciences Report 2011/2012
Executive Summary



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Executive Summary

The recent financial crisis and the problems in the euro area have battered the economy, making it difficult to return to the favourable pace of growth that advancing globalisation and technological innovations had brought in the preceding decades. The crisis, but also the political pressure and the increasing competition from other markets, highlight the importance of keeping a watchful eye on economic developments in competing regions. The particular success of the Life Sciences industry forces regions, states and countries to aggressively compete for research and development (R&D) dollars, talents and new companies. These challenges make it important to know one's own region's specific strengths and advantages in order to exploit opportunities and successfully respond to deficiencies, which in turn, allows a region to secure its international competitiveness in scientific and commercial fields with promising futures.

The current "Life Sciences Report 2011/2012" has been developed by BAKBASEL to facilitate the analysis of detailed information and to enhance the conclusions drawn from regional comparisons. The study focuses on the performance capabilities and framework conditions of the Life Sciences industry in different regions, but also looks at future developments and their effects on society, business and politics. It is therefore targeted to policymakers, as well as to business oriented agents. The data of the report includes comprehensive information on 15 countries and 16 regions in North America, Western Europe and Japan, which is extracted from the brand new data from the "Monitoring Life Sciences Locations" database. The aim is not only to present and analyse well-established Life Sciences regions, but also to study emerging regions with large growth potential which are gaining in importance as possible competitors. For this reason, various Asian Life Sciences locations have now been integrated into the project. Those interested in a particular region can assess its performance and framework conditions, as well as evaluate its position within the larger Life Sciences industry. This is facilitated by the broad selection of regions and geographical areas which are included.

Importance and performance of the Life Sciences industry

The Life Sciences industry historically reveals above average productivity and job creation and is among the most dynamic industries in many countries and regions, with a growth rate which usually surpasses the growth rate of the aggregate economy. In the Basel Region, an impressive 8 percent of all employees work in the Life Sciences industry. Other regions with a high share of Life Sciences employees are California, New Jersey, New York and Milan, but no other region in the world comes anywhere near the Basel Region's density.

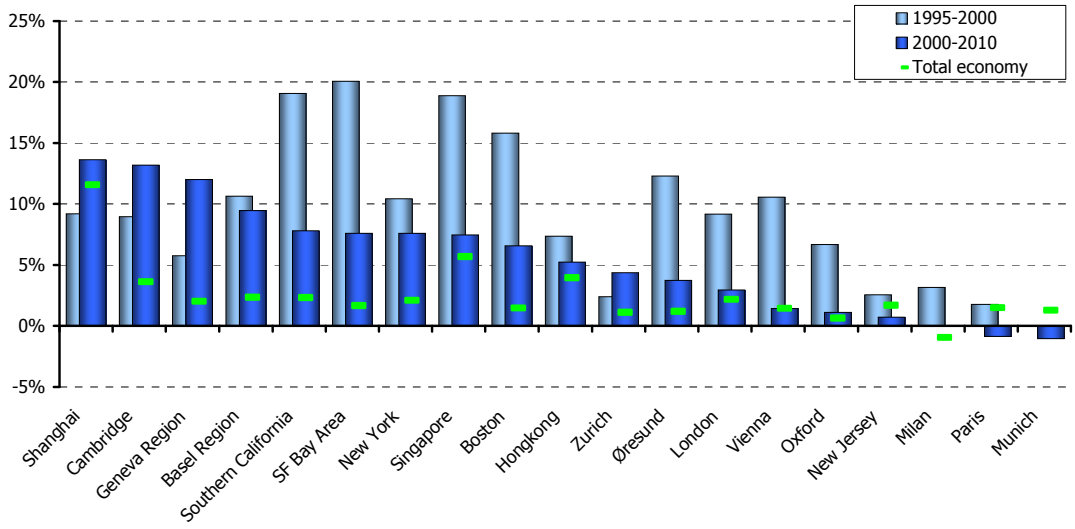
Employment in the Life Sciences industry in the regions, 2011

	Employment in Life Sciences	Share of Total Employment
Basel Region	27'600	7.8%
New Jersey	79'500	2.0%
Milan	33'600	1.6%
Cambridge	5'000	1.6%
SF Bay Area	30'000	1.4%
Øresund	21'200	1.1%
Shanghai	91'700	0.8%
Geneva Region	5'700	0.8%
Boston	23'400	0.8%
Vienna	12'700	0.7%
Southern California	51'900	0.7%
Singapore	22'000	0.7%
Paris	36'600	0.7%
New York	55'700	0.7%
Zurich	5'500	0.6%
Munich	9'700	0.5%
Oxford	1'400	0.5%
London	13'500	0.3%
Hongkong	4'800	0.1%

Employment in the Life Sciences industry (in number of people) and the industry's share of total employment
Source: BAKBASEL

The gross value added (GVA) measures the value of goods and services produced in an area or sector of the economy. Its increase is therefore a performance indicator for the vitality of the Life Sciences industry. According to the figure below, the Life Sciences sector has in general demonstrated high growth potential in the last decade, mostly exceeding the average growth of the regional aggregate economy.

Increase in real gross value added (GVA) in Life Sciences

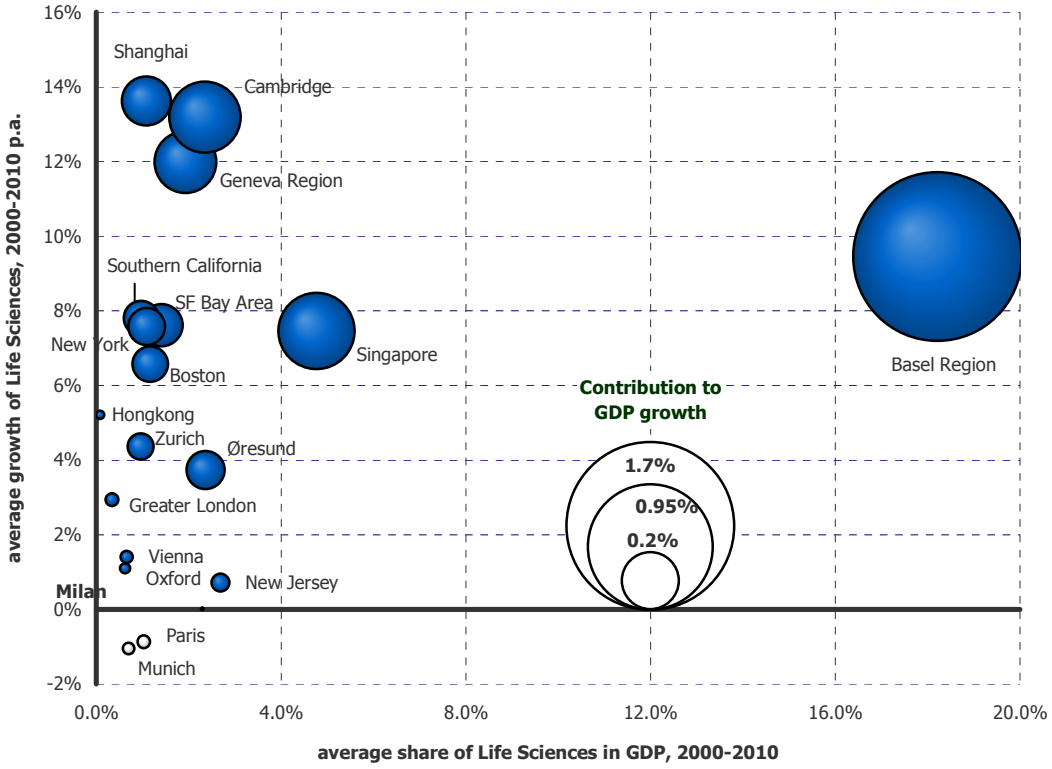


Annual average growth rate
Based on USD at 2000 prices and 1997 PPP
Source: BAKBASEL

The highest growth rate of gross value added in Life Sciences across all regions was observed in Shanghai, Cambridge, the Geneva and Basel Regions. Comparing the eight largest Life Sciences locations which have around 30'000 employees or more each (Shanghai, New Jersey, New York, Southern California, Paris, Milan, SF Bay Area, the Basel Region), the Shanghai region is distinguished by the highest number of employees, as well as the highest 2000-2010 growth rate in value added. The Basel Region follows in a close second place. Paris and Milan are big locations with stagnating or shrinking Life Sciences growth. Another interesting point is that many regions with enormous growth rates between 1995 and 2000 have not been able to sustain these growth rates in recent years. Only Shanghai, Cambridge, the Geneva Region and Zurich have managed to increase their annual growth rates more in the last decade than during the period 1995-2000.

Due to its dynamic growth and importance, the Life Sciences industry greatly contributes to total economic growth. The larger the bubble in the figure below, the larger the Life Sciences industry's contribution to regional GDP growth is.

Contribution of the Life Sciences industry to economic growth



Average growth in 2000-2010, based on USD at 2000 prices and 1997 PPP
Average share from 2000-2010, based on USD, current prices
Source: BAKBASEL

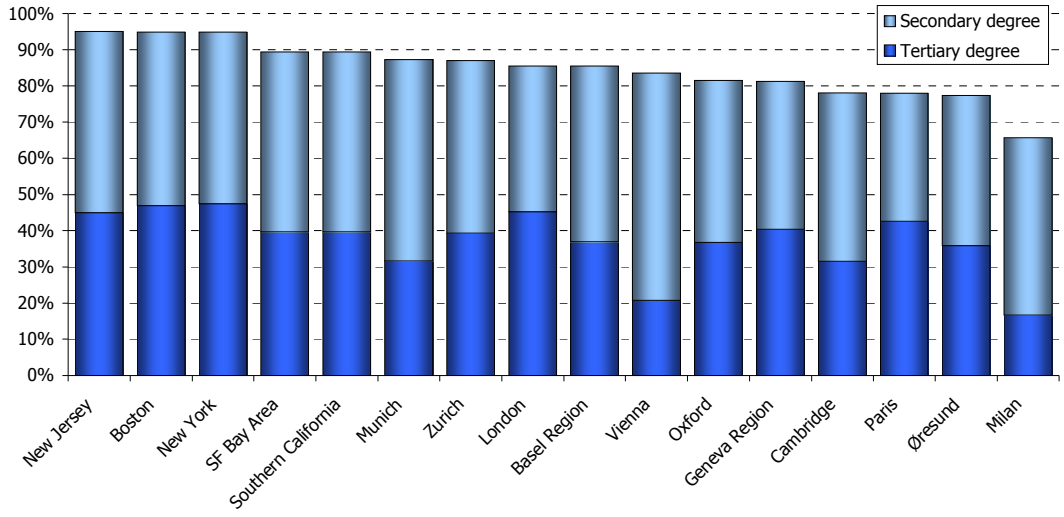
The central finding of this comparison is obvious. Nowhere else is the Life Sciences industry as important to the local economy as in the Basel Region. More than 1.7 percentage points of the total 2.4 percent average annual GDP growth between 2000 and 2010 was contributed by the Life Sciences industry. This high contribution can be explained by the region's strong cluster of highly performing pharmaceutical companies.

Innovation capacity as central driving force for the Life Sciences

The Life Sciences industry is not just very promising and dynamic, it also has demanding requirements for its host locations. Besides generally important framework conditions like taxation and regulation, a region's innovation capacity is a crucial factor in attracting companies. Nowadays, competition between companies in knowledge-intense businesses is no longer driven primarily by price, but rather by innovation. The availability of a highly skilled and knowledgeable workforce is even more vital for the Life Sciences industry than for the total economy, because its products and processes are particularly knowledge intensive.

When making statements about the educational qualifications of the labour force, one has to keep in mind that the institutional settings vary substantially from country to country. Furthermore, a highly qualified workforce with a high degree of practical know-how is a key factor for productivity and, consequently, for sustained economic growth. Therefore, even for the exacting Life Sciences industry, it is important not only to look at the share of people with tertiary education, but to include the share of people with secondary education as well.

Highest completed education in the Life Sciences labour force, 2010

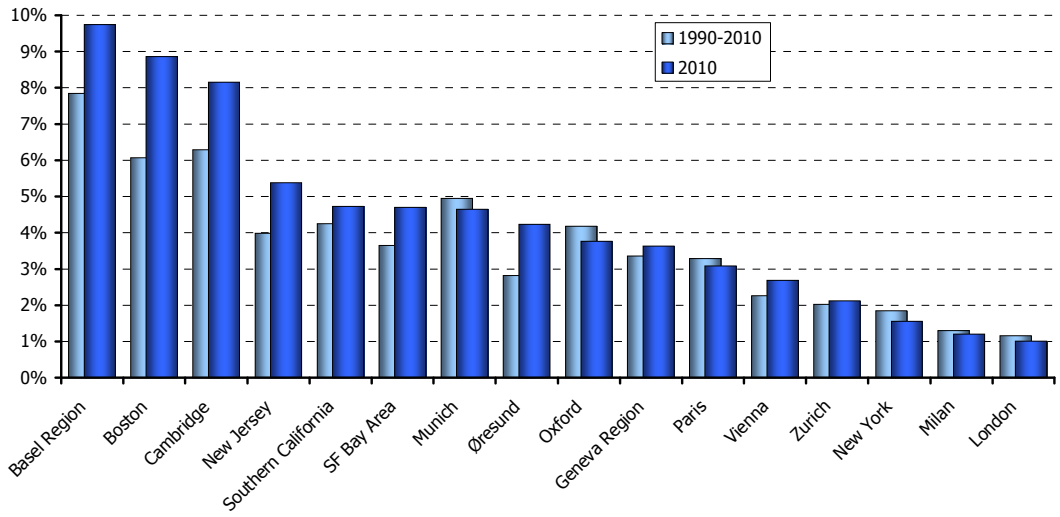


Share of individuals with secondary/tertiary degree in total employment
Source: BAKBASEL

In most regions, between 80 and 100 percent of individuals employed in Life Sciences have a secondary or tertiary education. In general, strong national patterns are present in the ranking which reflect differences in school systems. The US Life Sciences regions lead the ranking. All of the US regions show a strong concentration of employees with tertiary education. On the contrary, the continental European regions generally show a stronger concentration of employees with secondary education because of the important part that vocational training plays there.

Furthermore, innovation is crucially dependent on expenditures on R&D. This input for innovation is especially vital for the Life Sciences industry. The R&D expenditures comprise total internal R&D expenditures in all sectors of performance, i.e. in the business enterprise sector, government sector, higher education sector and private non-profit sector. To make different regions of different sizes comparable, R&D expenditures are depicted as a share of the regional GDP.

Share of expenditure on R&D in GDP



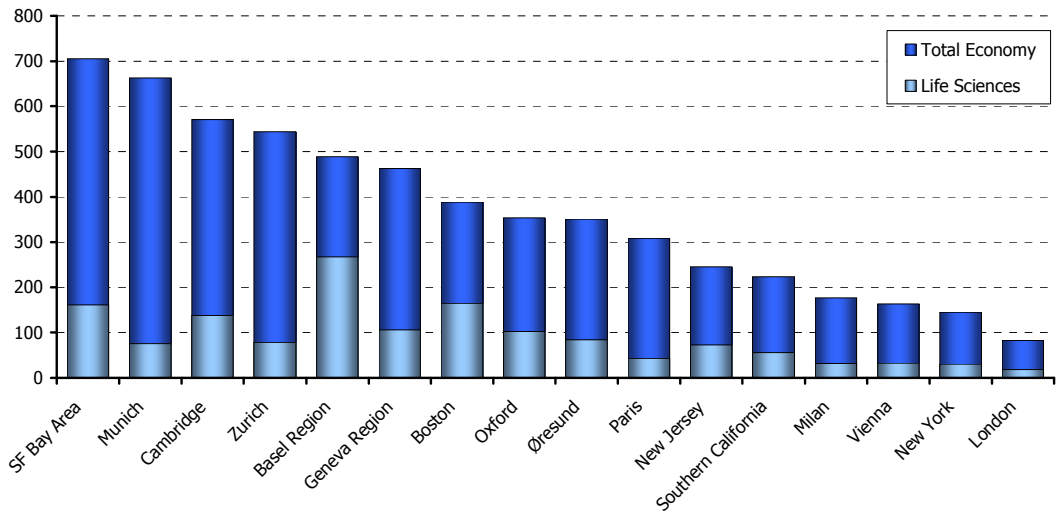
Source: BAKBASEL

In 2010, the highest share of expenditures on R&D in GDP is found in the Basel Region. This high share is mainly driven by the local pharmaceutical industry which invests intensively each year. The highest increase in investment is also seen in the Basel Region: expenditures on R&D in 2010 is 1.9 percentage points higher than the long-term average.

In order to evaluate innovative capacity, it is important to determine the extent to which individual regions are capable of converting their resources, such as financial means or human capital, into new products and production processes which, in turn, improve the economic prosperity of the region. A chosen indicator for this capability is the number of approved patent applications. Patents are the indicator most often used for the innovation potential of an entity. The underlying reason for this is that something new has to be invented in order to obtain a patent and since applying for a patent is costly, only promising ideas get patented. An innovation is by definition a new product or process that has been implemented successfully on the market, so patents can indeed reflect a region's innovation potential.

The data in the figure below consists of all patents that have been registered at the European Patent Office or the Patent Cooperation Treaty in 2009. In order to correct for the size of a region, the absolute number of patents per region is not used, rather, the ratio of patent filings to population is used instead.

Patents by main field[1], 2009



Patents per Mio. inhabitants
Source: BAKBASEL, OECD, REGPAT database

SF Bay Area, Munich, Cambridge and the three Swiss regions are the top regions for the total number of patents. For the Life Sciences industry, patents in chemistry are of primary importance. The Basel Region is clearly the leading research region with more than half of its patents in the Life Sciences field. Cambridge and Oxford, not surprisingly, as well as the SF Bay Area and Boston substantially contribute to the patents filed in the field of Life Sciences.

[1] Life Sciences = Patents in agrochemicals, pharmaceuticals and medtech, following: BLA.

Future prospects and availability of the «Life Sciences Reports »

After the reports in 2005, 2007/2008 (update in 2008/2009) and 2009/2010, the current «Life Sciences Report 2011/2012» is the latest step in the on-going monitoring programme that collects information on the development of the industry, the progress already made, and the need for further improvements to the Life Sciences locations. The Life Sciences regions already participating in the project get the full version of the Life Sciences report as well as individual analysis on the topic. Even though the full version of the Life Sciences report is only available for project partners, Executive Summaries are available to the public.

By updating the indicators of the «Monitoring Life Sciences Locations» project frequently, it can be ensured that the benchmarking is always done on the basis of the most recent data available. In the fast changing Life Sciences industry, it is especially important that the latest evolutions in Life Sciences locations are always included.